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FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR, SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seate of selfe-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

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The Late Dr. Schliemann.

THE sudden and unexpected death of Dr. Schliemann has been attended by almost universal regret. The story of his life had been widely known, with its early struggles against poverty, his subsequent success in business, and the ultimate devotion of his energies and fortune to the ambitious project of exploring the sites rendered famous by Homer, especially the sites of Troy, Mycenæ, and Tiryns. All these things he told in books, which were translated into several languages, the effect being that he soon became popular all over Europe and America. But, besides this, he was personally ubiquitous. He was known to many in many lands, not least in our own country. To these almost innumerable personal friends his death will have brought profound grief, but most of all, perhaps, to those who knew him in his home at Athens; and the number of these alone must be legion. No one will be missed like him in that city. He had a warm welcome for all who called on him. His hospitality was great, his enthusiasm was boundless, and his knowledge of practical and useful matters was unrivalled. In Athens he was a prominent figure,—possibly the most prominent. To the Greeks in general he was a benefactor of a kind which they had never seen before. At first a foreigner who settled among them, and never ceased in his endeavours to rouse them to the glories of their early history; and finally, a foreigner who had actually recovered enough of those glories to draw the eyes of all educated people to Greece. It will be strange if the Greeks do not preserve his memory in a worthy manner.

Born in 1822, Dr. Schliemann was still in the prime of life when he retired from business, and started as an explorer of the site of Troy. That was in 1868. For a while his excavations were unsuccessful, and no one was surprised. Some thought he was on the wrong track. All were ignorant of any qualifications that he possessed for the task. He was as yet unknown. By 1870 he had cleared away a good deal of soil at Hissarlik, the site which he had espoused as that of Troy. The results were meagre, but he was hopeful and buoyant. Time never was heavy on his hands. One rainy wintry evening in that year, when the passengers were arriving on board a steamer at Smyrna bound for Trieste, he was to be seen in the saloon seated busily reading the Koran. He had been learning Turkish and Arabic. During the voyage he talked all round, and with equal facility, to the very polyglot company on board. His special talk was, of course, of Troy. With restless energy he returned to Hissarlik, and by 1875 was able to lay before the learned world, in "Troy and its Remains," an extensive series of results on which he claimed to have proved that Hissarlik was the true site of Troy. The tide of opposition set in. He was told that Troy had never existed; that Homer had created it; and that, in any case, the things found at Hissarlik did not illustrate the Homeric poems—as, in fact, they do not to any appreciable degree. It would have been wiser of Schliemann to have maintained simply that he had found in the locality indicated in the "Iliad" the ruins of a pre-historic city which had been destroyed by fire, and that very probably it had been the fate of this particular city which long after had stirred the muse of Homer. His discovery would then have been examined in its true light, and its great importance for pre-historic study would have been amply recognised. But that was not his nature. Fired by a purely personal ambition, he required show and glitter. A poor piece of bronze must be Priam's chest. Something else must have belonged to Helen. Hideous earthenware vases, such as are found among most primitive people, must represent the owl-eyed Athena. Priam's chest must be Priam's chest till some one proves it to have been John Smith's. That was his line of argument in those days, and if he became wiser and more cautious in later times, as he most undoubtedly did, he had, nevertheless, provoked by these early outbursts of enthusiasm many misgivings as to the value of the work he was doing.

After a time he returned again to Hissarlik, and gave us, in 1880, the results of his renewed exploration in the fine work entitled "Ilios." Even then he was not satisfied that everything had been done for Troy. Only last year he was there, digging and projecting a new campaign, which his death will have interrupted, unless he has charged Dr. Dörpfeld to carry it on. Be that as it may, it seems clear that, from Dr. Schliemann's own point of view,—the glorification of Homer,—these prolonged excavations at Hissarlik have been a failure. But equally, from the point of view of pre-historic archæology, they have rendered immense service. If a fault is to be found, it would be that the glamour thrown by Dr. Schliemann over these primitive antiquities has attracted many students who would have been better

employed on the later and finer art of Greece, and who not unfrequently have been repelled altogether from prosecuting the study further. But the crowning achievement of Schliemann was the discovery of the tombs at Mycenæ in 1876-7. Travellers had long been accustomed to admire the great walls of the citadel of Mycenæ. The two lions sculptured in relief above the gateway—the city arms, so to speak—were familiar in books on Greek art. The fine vaulted tomb outside the citadel, variously known as the tomb of Agamemnon and the Treasury of Atreus, had been quoted on all hands. Yet no one appears to have dreamt that anything of consequence lay buried in the weed-grown heaps within the walls. It is to the imperishable renown of Schliemann that he saw otherwise. He himself must been amazed when the graves opened and discharged their quantities of precious objects. It seemed quite natural to him to announce to the world that the bones which he had found of some primitive chief were the bones of Agamemnon. Homer was again dragged into the scene; and again a contest arose. But that is all past. The argument now put forward is that the antiquities of Mycenæ belonged to a much earlier age than that of Homer,—that they represent a civilisation which had been swept away by the invasion of the Dorians from the north of Greece about the eleventh century B.C. It was of that past age that Homer sang; but so much of the actual remains of that age had been destroyed by the rude Dorians that Homer could not find enough among them to give local colour to his poems. For that he had to draw upon his own times. He knew only of the walls of Tiryns, the wealth of Mycenæ, and some few other points. When the argument is put on this ground the discoveries at Mycenæ assume the first importance. They would thus teach us more of that early race than Homer himself knew. But this argument cannot be accepted without question. As likely as not these antiquities are the remains of the Dorian invaders. The Dorians were rude, but not ruder than most of the antiquities; and, in fact, analogies have often been observed between the mode of burial at Mycenæ and at Hallstadt in the Austrian Tyrol. More recently, with the discovery of two gold cups at Vaphio, near Sparta, in a tomb of the Mycenæ kind, we have seen that the men figured on these cups, in the act of hunting bulls, have much of the Celtic type. They are of a peculiar, slim form, with long hair. They wear boots with straps twisted round the leg, well up towards the knee, and they have a girdle round the waist. These are striking features of the ancient Celts, which it is very probable the Dorians had shared with them. So that after all the graves of Mycenæ may attest the presence of the invading Dorians and their settlement there.

When Dr. Schliemann had thus provided work for a generation of archæologists, he moved next to the neighbouring site of Tiryns, with its Cyclopean walls and its traditions of the heroic age. Here also fortune smiled on him, though she did not go so far as to indicate the whereabouts of the old prison-chamber of Danaë, with its shower of gold. Under the long-neglected heaps of earth he found the ruins of an extensive house or palace, which in its plan corresponds, as many believe, with Homer's references to the construction of palaces. Others, whose love for Homer is of a more poetic kind, resent this forcing of an archæological meaning out of his phrases scattered here and there. Some even deny that his expressions apply to the palace at Tiryns. At all events, the ruins which Schliemann found are there, and they clearly belong to the same period as the Mycenæ antiquities. The fragments of painting in stucco from the walls put this beyond doubt. In character they are identical with fragments found at Mycenæ since by the Greeks who have continued his excavations. Other facts point in the same way, but we mention these paintings on stucco because they are the only specimens yet found which give us a notion of the inner walls of a great house in those primitive times, with their bright colours and rude but forcible drawing. After Tiryns he did nothing of importance.

From what we have said it will be evident that much of the hostility with which Dr. Schliemann's views were met from time to time arose from no disparagement of his discoveries, but rather from a conviction that they required a different interpretation,—that they were more important when considered simply as historical facts than when forced into connexion with the poems of Homer. He was himself somewhat to blame. But these controversies have lost all their acrimony long ago. What remains is the recollection of his splendid services.

MEDIÆVAL OXFORD.

BY H. W. BREWER.

THAT careful study of the records of the past, which has become such a marked feature of our day, has of late done much towards elucidating the antiquities and chronicles of ancient Oxford. Among the very many works which bear upon the subject, we must first mention the Rev. Andrew Clark's new edition of A. Wood's "Antiquities of Oxford." This valuable work is accompanied by numerous notes and explanations, and by a series of excellent maps drawn by Mr. H. Hurst, under the author's direction. Monastic Oxford has received considerable attention at the hands of the Rev. F. Goldie, in a modest but carefully-written pamphlet entitled "A Byegone Oxford;" and the doings and surroundings of the Franciscans in Oxford have been described by the late Rev. J. S. Brewer, in his "Monumenta Franciscana," and more fully and completely by the Rev. Dimock Fletcher, in his monograph of the Franciscan Order in Oxford. The Oxford Architectural Society has also contributed many excellent papers, carefully written by local antiquarians, who, from having been able to study various discoveries, which have been made from time to time, have added much valuable information to what was already known of Mediæval Oxford.

It would not be possible in the course of a single article to give a description of Mediæval Oxford, and the utmost that our space will permit us to do will be to describe the principal points of difference between the Oxford of the sixteenth century and the city as we see it to-day.

It may safely be asserted that no town in England can boast of any combination of street architecture so striking as the "High" and, in all probability, that noble street is more magnificent as we see it now than at any previous period of its history. Broad street, St. Aldates, and the numerous streets which combine these together, or lead out of them, are as full of noble and stately buildings as they ever were; but it is far otherwise when we come to consider other parts of the city, especially the south-western district included in the parish of St. Ebb, and the western now known as St. Thomas's.

It is quite impossible without very careful study of ancient records, documents, drawings, and the scanty fragments which remain of Mediæval buildings, when looking at this district as it is to-day, to realise its past glories. Where we now find ugly railway-stations, dingy goods sheds, grimy coal depôts, shabby rows of workmen's houses, gasworks, and all that squalid ugliness with which modern civilization surrounds a large town in its least fashionable suburbs, were formerly abbeys, monasteries, churches, colleges, and halls which were equal, if not superior, to anything existing in the best parts of Oxford at the present day. Their destruction, apart altogether from any religious question, was amongst the most shortsighted examples of waste and folly, and we can only echo Dr. Johnson's sentiment when he was shown the scanty ruins of Osney Abbey. "Sir," said he, "to look upon them fills me with indignation." What colleges might not have been formed out of Osney Abbey, Rewley Abbey, and the Monasteries of the Dominicans and the Franciscans?

In looking at our view, a vast structure, or series of structures, occupies the principal part of the foreground (see lithograph). This represents Osney Abbey as it appeared about the year 1520. At present, all that is left to represent it is a portion of the building attached to the mill at the right hand, a fragment of the foundations of the gateway at the end of the same building, a small portion of the wall near the great gate on the left, some bases, corbels, fragments of vaulting ribs, which seem to have belonged to the inner cloister, but are not "in situ," and a few encaustic tiles. There are also some fragments built into the tower of the church of St. Mary Magdalene. Even Henry VIII. appears to have had scruples about destroying this stately and magnificent pile, for, at the suppression of the monastery, he converted the Abbey Church into the Cathedral of the new diocese of Oxford, the canons and prebends being lodged in the monastic buildings, and the dean taking up his residence in the Abbot's Palace. This arrangement, however, unfortunately, lasted only for a few years, when the Cathedral establishment was transferred to Christchurch, and Osney was handed over to ruin and destruction.

Our readers will naturally ask, what authority is there for the restoration of this great building, which has now completely disappeared? In the first place, I must acknowledge my obligation to Mr. H. Hurst, whose name has been previously mentioned, for kindly giving me a rough plan showing the positions of the various discoveries which have been made from time to time while digging the graves in the cemetery, which covers the eastern and northern portions of the site. From these it has been possible to trace the enclosure of the inner or smaller quadrangle, the position of one of the buttresses of its cloister, the position of the great west tower of the church, of the conduit in the western courtyard, and the building called the "Domus Dei," near the great gate. And now as to ancient authorities. William of Worcester gives us the dimensions of the church as he saw it in 1480; but, unfortunately, his mode of measuring buildings is not very reliable, as it is simply given in paces, "gressus," and, when he does condescend to use the word feet ("gradus"), he rather adds to the confusion. However, taking his "gressus" at 24 in.; and, making allowance for the confusion between "gressus" and "gradus" with regard to the western tower, Mr. Goldie calculates the extreme length of the church at 360 ft., the width at 100 ft., which he conjectures to have been measured at the transepts, but here we think he is in error, because Wood states distinctly that the church had double aisles, and, although 100 ft. might be too great a width for a nave and aisles, it might not be at all out of the way for a nave and four aisles. It is probable that William of Worcester has somewhat exaggerated the length of the building, because, although Yates in 1804 tested the "gressus" of William of Worcester, and found that in the case of the remains of the Abbey Church of Bury it worked out at slightly more than 24 in.; yet, in his measurement of New College Chapel, if we take the "gressus" at 24 in. it makes the church considerably longer than it actually is. Comparing, however, other abbey and priory churches erected by the Canons-regular in England, we find that, as a rule, they vary from 228 ft. to a little over 300 ft. Christ Church, Hampshire, which is the most perfect example handed down to our time, is 311 ft. long, so that, making all due allowances for inaccuracy or exaggeration on the part of William of Worcester, the abbey-church of Osney was in all probability not far short of 300 ft. in length. In the works of later writers we find a considerable amount of information concerning this vast building. It would oc-

cupy too much of our space here to copy down the various descriptions given by Hearne, Wood, Peschel, Turner, and others, but if we summarise what they tell us, we find the following particulars. The church was cruciform, with a lofty tower at the west end and another over the crossing. It had four aisles, and contained twenty-four altars in addition to the high altar (so that probably the outer aisles were subdivided into chapels as in Continental cathedrals). There were two lady chapels, one to the east, and the other to the north. The great gate was to the north, with a smaller gate more to the east, and between these stood a building called "the Domus Dei," where poor pilgrims were entertained and lodged.

To the west of the church was a very large quadrangle of cut-stone (said by some writers to have been as large as the Tom quad at Christchurch). A cloister went round three if not four sides of this quadrangle, which had a flat, boarded roof. The refectory was on the south side of this quad, and was approached by a great stone staircase. The kitchen was to the west of the refectory, and the infirmary with its chapel to the south. To the north-west of the great quadrangle were the Abbot's lodgings, which contained a great hall, also approached by a wide staircase, and the great parlour, kitchen, other offices, and chapel. Dormitories and a school-house are also mentioned, and Turner, in his Oxford Records, mentions a vast number of offices which were made over by Henry VIII. to Stump, of Malmesbury, whose name is associated with the destruction of the Abbey buildings of his own town. Among these offices are a bake-house, a malt-house, a cook's-house, timber-yard, &c. Most of these were situated in the range of buildings by the mill, which, until their destruction towards the end of the last century, went by the name of the Canon's Building.

Comparing this description of Osney Abbey with plans of monasteries erected by the Canons Regular, given by Somern and Ravenstein, "Brabantiæ Sacra," &c., we are enabled to suggest the probable uses of many portions of the edifice. The great cloister to the west is, in some of these monasteries, figured as "Ambitus Laicorum," the smaller cloister by the side of the church as "Ambitus Sacerdotum." The building between the two is the lay-brother's dormitory,—those of the choir monks surround the inner cloister or "Ambitus Sacerdotum." The guest-chambers for the men, "Diversorium Virorum," are round the west cloister, and those for the women, "Diversorium Feminarum," near the gate. All the offices, farm-buildings, &c., form a different range of buildings, and the infirmary with its chapel stood near the great court. The Abbot's house generally had its separate court. All this accords with what we know of Osney.

Now we must consider the pictorial evidence. The earliest representation of Osney Abbey which I have come across is a tracing from a manuscript drawing contained in some papers kindly lent to the writer by the Rev. F. Goldie. Unfortunately the reference to this is lost. It shows, however, a gate, with a tower of the church rising over it, crowned by a short lead spire. This feature has been adopted in my restoration. The next representation is in the stained-glass window commemorating Bishop King, last Abbot of Osney and first Bishop of Oxford, erected in 1551. This shows a portion of the ruins of the church, consisting of the central tower, with the weatherings marked upon it of the nave and transept, and a series of lofty pointed arches, evidently intended to represent the nave-arcade. From this we are able to see that the latter was semi-Norman, that the church had been greatly heightened at a later period, probably by Abbot Leech, who rebuilt a large portion of the church and monastery about the year 1247. The portion of the tower which after this alteration was visible over the roof, had two large windows in each face, and little ones, almost loops, above them. Buttresses run up at the angles showing that there were pinnacles.

In the Wood collection at the Bodleian is a coarse pen-and-ink sketch, entitled "Prospects of the North Side of the Ruins of Osney Church," 1574. This was discovered by Wood, and is referred to by him as "the draft," but it is not so trustworthy as the representation in Aggas's view of Oxford, dated ten years later. The two towers were both in existence when these views were made, and the walls of both the nave and choir. In Agas the great gate is shown opposite the western tower to the north, and the latter has a large doorway, which communicated with the porch, the parapets and pinnacles of which are recorded to have been thrown down by one Poppynge-Jay, at the dissolution of the Abbey. The same individual seems to have been busy at about the same time in removing the choir stalls and the lead from the roof. The site of the great court is indicated to the west of the church and the "Canon's buildings." The most valuable, however, of all the views of Osney is that to be found in a few copies of the first edition of the Monasticum.

In the Ballard collection, at the Bodleian, we are informed that it was one of a series of drawings of Osney, made for Sir John Aubrey at the cost of 20s. by one Hesketh, a Hedge priest. Now this same "Hedge priest" must have understood a great deal more about Gothic architecture than most of the draughtsmen of his time, because he and Hollar, the engraver, have between them left us a very reliable and valuable representation of the great Abbey, as it appeared in their days, just immediately before the entire destruction of the ruins of the church, in 1644, by Charles I. to complete the fortifications of Oxford, against the Cromwellians. This engraving shows the ruins from the south-east; the great west tower of the church is complete. The upper story was evidently Perpendicular work, and is covered with panelling, the whole crowned by an open parapet. The tower lights are very long and narrow. As in the centre tower, the evidence of a lofty clearstory having been added at later times is very distinct. The lean-to end of the inner south aisle is shown attached to the west end of the tower, and near it a plain gable, which must have formed the west-end of the outer aisle. Part of the wall of this aisle is shown with what looks like the remains of a Norman Triforium. The west side and gable end of the south transept were pierced by very long Decorated or Perpendicular windows; attached to the south end of the transept is a large chapel or sacristy with a doorway which seems to have communicated with a vestibule of the chapter-house. At the angle of the nave and transept the remains of the Norman triforium are visible; to the south of the site of the chapter-house is shown a lofty Early English gable pierced with a triple lancet window very high up, and a crypt beneath this was probably the school-house. In the Gough collection at the Bodleian is a water-colour drawing from almost the same point of view, and an etching which was probably copied from it. The "Exeter Benefactor's Book" shows a view of the church from the north-east, showing both towers, but, as it is made in 1721, it can only have been a second-hand affair. There are also drawings of the ruins in the *Gentlemen's Magazine* and the collection of the King's Library in the British Museum. In "Steven's Continuation to Dugdale," and in the King's Library collection, are views of "the Canon's building," from the east and west points of view. The bake-house, "kyll" (malt-house), and a whole range of buildings lit by square-headed windows, is also shown. An engraving, dated 1818, shows the old mill and the buildings between it and the kitchen. What at present exists of these buildings is represented in a sketch by the writer, published in "the Oxford Supplement of the *Graphic*" a few years back. Much as we should like to dwell at greater length over this interesting portion of the subject, we must hurry on to describe other Mediæval structures.

To the north of Osney Abbey was the suburb of St. Thomas (in early days known as St. Nicholas). The old church still exists, and is the solitary example of ancient ecclesiastical architecture now left in this dreary region. The principal street or lane, called the "Hamel," led from St. Thomas towards the castle. A lane to the north of the Hamel led to the gateway of Rewley Abbey, which belonged to the Cistercians. Of the outer gate, or rather its ruins, a number of views are to be found. It had two arches, the larger of which was ogee in form, and was adorned with carved scutcheons, &c. An avenue of elms led from this to an inner gate, which seems to have led into a court, which was surrounded by buildings, views of which are to be seen in "Steven's Continuation," the King's Library collection, &c. These were, I think, the Abbot's lodgings, guest hall, &c., because they must have been north-west of the church, the position of which was ascertained by the discovery of the foundation-stone about 1706. Of the church itself no representation exists. Wood tells us that it had a spire, an uncommon feature in Cisterian churches; probably, however, it was only a kind of wooden capping to the centre tower. The views of the monastic buildings show that, although they were on rather a small scale, they were fairly rich decorated work. A solitary doorway is all that now exists of Rewley; this is represented in a drawing made by the writer in the Oxford Supplement of the *Graphic*. Crossing over Hithe Bridge, and turning to the north we should have found two very interesting buildings. The first was called "Gloucester College," and was the headquarters of the Benedictine monks in Oxford. The lower or garden quad of Worcester College still exhibits considerable remains of this ancient college. The chapel, erected in 1420, was of important dimensions, adorned with magnificent stained glass, and dedicated to St. Benedict, but was completely destroyed at the Reformation. To the north-east of Gloucester College stood another fine Mediæval edifice called "Beaumont Palace," which was a royal residence, and Richard, "the Lion-hearted," was born within its walls. Edward II. made over the building to the Carmelite Friars, who, in the reign of Henry V., erected here a stately church, the tower of which, says Mr. Goldie, marked the site of the chamber in which Richard I. was born. Some fragments of the wall may be traced, which possibly belonged to this structure, though even when Aggas made his view of Oxford little save one of the gateways would appear to have been in existence, and that not the principal one, which was at the opposite end of the ground, near St. Mary Magdalene's Church, where we still find the name, "Friars' Entry." In the King's Library, British Museum, are drawings of some remains of the building during the last century. They seem to have consisted, for the most part, of a very beautiful semi-Norman crypt.

The large suburb of Oxford which stretched out from the gate, called the "Bocardo," close to St. Michael's Church, contained many collegiate and ecclesiastical buildings, several of which still remain, as St. Bernard's College, now St. John's, St. Mary Magdalene's, and St. Giles's churches; here also stood "Black Hall," "St. Margaret's Hall," "Greek Hall," "St. Mary Magdalene's Hall," and many others, of some of which the buildings have disappeared and others are converted into dwelling-houses.* Baliol College existed at the time of which we are speaking, and under the name of "Durham College," the masters' lodge and adjoining buildings of Trinity. Where Wadham now stands was the church and monastery of the Augustinian friars, and here we have again an example of the short-sighted absurdity of the destruction of the monastic buildings of Oxford, for this stately monastery cannot have disappeared half a century when it became necessary to erect the buildings for a college on its site. There may be a doubt, by the way, whether the

* Mr. Clark gives the names and situations of eighty-four halls which existed in 1440.

gateway of Wadham may not possibly be a portion of the old monastic buildings very considerably "cooked up." The details of the bow window and staircase are very unlike Jacobean work, and show a marked difference to any other portions of the building.

Not far from the Austin-friars, at Smith's-gate, which formed the second entrance to the town on the north, stood a curious little structure, called "The Chapel of Our Lady," which appears to have been circular or octagon in plan, recalling to one's mind the "Lady Chapel on the Mount," at Thetford. It appears to have been in existence when Aggas made his view of Oxford. Still continuing outside the walls by Holywell-street we should have found a series of great fish-ponds. The abrupt turn to the right at Crowell would have brought us to the east gate of the city, which stood near the present Botanical Gardens. Magdalen College, with its beautiful tower, stood in the suburb of East Gate, and must have looked singularly beautiful with the old Gothic bridge and causeway beneath it. Nearer to the gate of the city stood the monastery of the Trinitarian Friars, and at the opposite end of the bridge the quaint old church of St. Clement, which possessed an extremely picturesque gabled tower, a watercolour drawing of which is to be seen in the King's Library, British Museum.

Another causeway leads up to the east gate from Milham Bridge, the ruins of which may still be seen. Passing a chapel called "Our Lady on the Wall," the neighbourhood to the south of Oxford, between Millham Causeway and the great entrance to the town, called "Grandpont," the site of Christchurch meadows, appears to have been intersected by a number of streams and watercourses.

"Grandpont," now called "Folly Bridge," was the most important approach to Oxford, and upon this ancient bridge stood a gateway, surmounted by a tower, which went by the name of "Friar Bacon's Study." Perhaps that illustrious scholar may have used it as an observatory.

Crossing Grandpont Bridge, on the left we should have found the gateway of the Dominican or "Black Friars'" Monastery. This was one of the most important Monastic institutions in Oxford, and possessed a spacious church and a large school or college attached to it, it was also the residence of the Bishop of the diocese, upon the occasion of his visits to Oxford, so that it may be regarded as a combination of monastery, college, and palace. The buildings, however, had almost disappeared in Agass's time, but some drawings of the gateway and adjacent structures as they existed in the last century may be seen in the King's Library.

Continuing up Grandpont-street past the picturesque front of Littlemore Hall, the remains of which still exist, we should have crossed over Trill-Mill-Stream, and should have had before us a very steep ascent called "Tower Hill," on the top of which stood the south gate of the city, with the Church of St. Michael-South-Gate almost adjoining it to the right. A little within the gate on the left we should have recognised St. Aldate's Church, but to the right we should have looked in vain for the stately front of Christchurch, which was not commenced until two or three years later.

St. Frideswydes-street would have conducted us to the great monastry bearing that name, with its noble church, the remains of which serve now as the cathedral of Oxford. A part of the cloisters, refectory, and the chapter-house, which still remain, serve to show us the elaborate character of the buildings which formed this monastic institution. Within the walls of the city we should have found many objects with which we are familiar. Among the colleges we should have been able to distinguish Merton, Corpus, Brasenose, All Souls, New, Lincoln, and Exeter, though very much smaller than they are at present.* Queen's and Oriel were there, but the present buildings are very unlike those which existed in the sixteenth century. Judging from Loggan's view, Old Queen's must have been a most charming Gothic building, possessing a chapel, with very elegant curvilinear Decorated windows. Another beautiful little building was Canterbury College, which stood on the site of the Canterbury-court of Christchurch. Great University Hall, and St. Mary's College, near the Castle, were also beautiful examples of Mediæval collegiate architecture. All Saints' Church, which occupied the site of the present one, was an interesting-looking edifice, several drawings of which exist, it had an embattled tower, crowned by a lofty spire, which looks, from the drawing, as if it were of wood covered with lead. Drawings also exist of the churches of Carfax and St. Ebb, both of which were picturesque buildings. Close to St. Ebbs' Church stood the great monastery of the Franciscans or Grey Friars. The site is not quite clearly ascertained, though it appears to have been within a triangle between the west gate, the little gate, and St. Ebbs' churchyard.

There is a place here still called "Paradise-gardens" and "Paradise-square," where formerly stood a small monastery of the Penitential Friars, or "Friars of the Sack," who were suppressed in 1309 and their site given to the Franciscans. The word "Paradisus" was frequently applied to portions of old monasteries and churches, and it is by no means improbable that this formed the gardens of the Franciscan monastery. The Friars seem to have obtained permission to alter the city walls so as to make them enclose their convent just as the Monks of St. Freideswide had previously done. William of Worcester gives a description of the church, which appears to have been a vast cruciform structure some 300 ft. in length!

Close to the Franciscan monastery stood the west gate of the city, and a fortified bridge near to it led to the castle. Of this magnificent Norman building little now remains, except the bell-tower, which appears to have belonged to the Collegiate Church of St. George, which stood within the castle enclosure, rather than to the castle itself. The same may be said also with regard to the Norman crypt which was rebuilt some years back. Attached to this church was a college of priests, called St. George's College. Numerous views and plans of the old castle exist, and may be seen in "Munimenta Antiqua," Woolnoth's "Castles of England," Ingram's "Memorials," and drawings in the Kings' Library, British Museum; these latter show the remains of the Collegiate Church of St. George, and from them it would appear to have been a Norman building, with an apse at the east end, one transept, and a central tower in addition to the great campanile still existing. Like Merton, this church was parochial as well as collegiate, and had a parish attached to it. In early times there were two other parishes to the south-west of the castle, the sites of the churches of which have been ascertained; they were "dedicated" to St. Benedict and St. Budoc. The former stood upon the site which, later on, was occupied by the house of the penitentiary Friars, and St. Budoc's was close up to the castle-moat. Now, this would lead us to the conclusion that, before the fourteenth century, there was a large suburb of Oxford spreading out towards Osney in one direction, and the Thames in the other, and, possibly, covering what is now known as "King's Mead" and South Osney Isle. When and how it disappeared is impossible to say, but we know that both churches and inhabitants had gone before the sixteenth century. It seems as though the "Black Death," or some of those terrible visitations which decimated the population of our great towns, had here been active, the marshy soil, intersected by streams, and often covered for months together by water, would have proved a powerful ally in the work of destruction.

Of course it has been found impossible in the length of this article to give more than a very cursory glance at Mediæval Oxford. Nor have I been able to mention the names of more than one or two of those gentlemen whose unsparing industry in studying records and remains of ancient Oxford have enabled me to produce the drawing which appears in this copy of the *Builder*. I cannot, however, conclude without expressing my thanks to Mr. H. Hurst and the Rev. F. Goldie for the kind way in which they have assisted me in the research necessary for the purpose, and to Mr. Madan, of the Bodleian Library, for information concerning the drawings, &c., contained in that institution. H. W. B.

* Their original appearance may be gathered from the views of Neal and Loggan.

THE GUELPH EXHIBITION.

IN spite of what has been claimed for it in advance, it can hardly be said that the Guelph Exhibition at the New Gallery, opened this week, has the same interest as the Stuart and Tudor exhibitions, either artistically or historically. In regard to artistic merit the names of Reynolds, Gainsborough, and Romney were advanced in the prospectus as promising great things, but the works of the first importance by these great painters are not very largely represented: and in the matter of decorative work the period illustrated was not likely to produce anything of so much interest as was found in connexion with the Tudor period.

The walls of the three galleries are hung mainly with portraits. One of the first to arrest attention in the West Gallery, where the numbering as usual commences, is Kneller's very clever portrait of George I. in a costume in which red predominates (6), and which is an exceedingly effective painting. The same painter's "Second Duke of Grafton" (9), a half-length showing an exceedingly feminine-looking face under a blue cap, is another work of considerable originality. Kneller is pretty largely represented in this room. By Hogarth there is an interesting half-length of the painter's sister Anne (20), and a curious group in the House of Commons (40) ascribed jointly to Hogarth and Sir J. Thornhill, the latter of whom we may presume painted the architectural surroundings of the Speaker's chair, which are unfortunately very badly drawn. The well-known picture of "Fox Addressing the House of Commons" (95) is also to be seen in the North Gallery; a work which was exhibited at Burlington House a few years ago, and which is more interesting historically than pictorially; no painter's name is suggested for it. Gainsborough's full-length portrait of George III. (51), standing in a park with his back to a portico, is a fine example of its class, and forms one of the central features in the room. Superior to this however, is the same painter's half-length of George IV. as Prince of Wales (54), a portrait of great vigour. Copley's painting of the children of George III. (67), well known from engravings, maintains its reputation well, and is full of life and animation in the figures, besides possessing other pictorial merits.

In the North Gallery a painting of William Pitt as a youth (105), anonymous, attracts attention by its fine colour, and the easy and natural attitude of the figure reclining back on a bank; the painting has much of the kind of merit peculiar to Gainsborough, whose style certainly influenced it. Opie's half-length of Burke (106) is a powerful work in which great force and character are imparted to the head. Reynolds's half-length of "The tenth Duke of Hamilton" (107) is another noticeable portrait; and still more so Gainsborough's half-length of Canning as a youth (110), with a delicate and almost girlish beauty, very finely painted. His "Fifth Earl of Chesterfield" (123), the one to whom the second and recently published Chesterfield letters were addressed, is a work in Gainsborough's finest style; the figure is seated in a landscape caressing one of the dogs which Gainsborough painted so well and lovingly. Another of the exceptional works in this gallery is Reynolds's beautifully composed group of the Duchess of Gordon and

her son (131): the two figures are seated together on the right, the youth a little behind his mother, the two heads brought together and finely contrasted. Of Nelson there are various portraits, of which the one by Rigaud, odd-looking enough and not a fine specimen of painting, is nevertheless highly characteristic in its boyish expression; a letter from Nelson is quoted in reference to it; "as to my picture it will not be the least like what I am now, that is certain," and in fact it rather suggests the remark of some one about Nelson in his younger days, that "he looked the merest boy of a captain I ever saw:" but he was admiral at the date of this picture. T. Phillips's half-length portrait of Napoleon (54) is powerful and lowering in expression. Hoppner's Duke of Wellington at the time when he was Colonel of the 33rd would hardly be recognised as a Wellington portrait, the well-known and characteristic features and expression are hardly to be traced in it. Weigall's full-length of the Duke as an old man (157), hung above it, though hard in texture and commonplace in an artistic sense, has the merit of dignity in attitude and expression. Gainsborough's portrait of beautiful Miss Linley (Mrs. Sheridan) and her brother (167) should not be passed over.

The South Gallery contains portraits of poets and other literary and artistic celebrities, many of them popularly known through engravings: Prior with the "night-cap" which formed the literary man's undress (197), Pope similarly decked (204); the portrait of Johnson without his wig by Reynolds (205), the same painter's well-known half-length of Goldsmith (211), Raeburn's massive and massively painted head of Scott (215), Romney's of Cowper, with the red night-cap; Reynolds's well known and *spirituel* portrait of Dr. Burney, holding a roll of music is in this room (269); and his large likeness of Foote the comedian, whose coarse features fully explain the contemptuous expressions of Johnson about him, recorded by Boswell. Hogarth's charming portrait group of Garrick and his wife (252) is also conspicuous, and the centre of the room is occupied by Reynolds's well known and rather stagey Mrs. Siddons as the Tragic Muse (245). As far as the portraits are concerned this is the most interesting gallery of the three, in artistic and other senses.

The cases containing various classes of objects are not the least important part of the exhibition. Miniatures, a class of work of which the personal and historic interest is so great, are largely represented. On these we do not dwell here, their interest is not artistic save in a very limited sense, though we no less appreciate them in another sense. The first case in the West Gallery contains a large collection lent by the Queen and other members of the Royal Family. Case B is of more varied interest. The high-heeled satin shoes take us back to the days of a different and more dainty and conventional social life than the present; the embroidered waistcoat stirs weak regrets in the mind of man that all the adornments of this kind should now be monopolised by the other sex. The silver salver designed by Hogarth and presented to Sir Robert Walpole by the Corporation of London is not of the best order of decorative art, as may be supposed: a view of London is engraved on a portion of it. Case C contains various relics of rather historic than artistic interest. Case D contains a valuable collection of miniatures, and E a miscellaneous collection of such things as snuff-boxes, bonbonnières, &c. Some of the French examples of the latter are charming knick-knacks; numbers 642 and 645 especially. Another case of miniatures may be noted, and the central case, G, is occupied by plate. Little of this is of any note artistically, except a silver centrepiece designed by Flaxman (827), an open-work silver bowl of graceful outline, supported on three little caryatides who join hands through the medium of wreaths held between them. Of other works the least ornamented are the best in artistic spirit; a good silver cup may be noticed (817), of a pattern common in the Georgian era, the bowl plain above and fluted below.

In the North Gallery case H contains relics of great interest as such, including the contents of Napoleon's travelling dressing-case, taken from his carriage at Waterloo. The silversmith's work was executed by Brennais for the Emperor, and is really artistic in spirit; little ornament, but that little refined and delicate. The series of Battersea enamels in case I is of real interest, and brings together a representative collection of a very admirable school of work of its kind. The set of three square blue caddies (898) are especially good and artistic in feeling. A large collection of miniatures, lent by Mr. Jeffery Whitehead, meet us in case J, and in K a similar collection lent by Dr. Propert, the Earl of Dartrey, and Sir Julian Goldsmid, including a curious one of Cosway by himself, in which he is got up in a kind of costume à la Rubens. "Relics of Nelson and Wellington" in case L is in a sense one of the most interesting items in the collection, but not in the artistic sense, certainly; and even in a "relic" sense "a ring of Copenhagen's snaffle" seems going rather low in the scale of reliquary worship, though Copenhagen is a historical horse, no doubt. The collection of watches from the 16th to the 19th century is of much interest, and some of them are beautifully and delicately ornamented, though there are no examples of that exquisite fancy which we noted in regard to a collection of old French watches in the Trocadéro a year or two back. The various ways of finishing a watch (externally) are interesting to compare, and it will probably be a new fact to many that at one time it was customary to make the back of the case of tortoiseshell. The examples are not dated. Of the collection of plate (N) in the middle of the room, the best is again the plainest, a large and massive loving cup (1,225) belonging to the Salters' Company, fine and sumptuous in outline, with no ornament except the Company's arms delicately engraved on the side of the bowl. Two German tankards, "rich and rough" with alto-relief compositions, are powerful and effective if not refined; and the large silver cup presented to Nelson by certain merchants, in commemoration of the battle of the Nile, is a fair piece of work, sumptuous in appearance if presenting no very original character.

In the central hall are some fine collections of Wedgwood china, and, what is of more interest, tablets of Wedgwood (on the screen), classic bas-reliefs, &c., in some instances known to be, in most instances presumably, the design of Flaxman; some of these are very beautiful. Another collection of watches is to be found here, which we have not time to examine; some arms of various interest, historic and artistic; a tolerably large collection of fans; and a case (V) of historical English china, among which pieces of common crockery inscribed with the names and portraits of Howe and Nelson, names of the ships in the battle of Trafalgar, &c., serve to remind us that England was once a great nation.

KAYE'S LOCKS.—The business of Messrs. Joseph Kaye & Sons, lock manufacturers, Hunslet, Leeds, and 93, High Holborn, London, has recently been converted into a limited company for the purpose of developing and bringing into use the many inventions of which the patents are owned by the Company. Amongst the best-known of these may be mentioned the "Push-and-Pull" lock.

BIRKBECK LITERARY AND SCIENTIFIC INSTITUTION, Bream's Buildings, Chancery-lane.—The Winter Term of this old-established Institution will open on Monday next. Over 200 classes meet weekly in commercial and technical subjects, Mathematics, Natural, Applied, and Mental Science, Languages, History, Literature, Art, Music, Law, &c., &c. On Wednesday evenings lectures will be delivered in the large Theatre of the Institution. Amongst those who are already engaged may be mentioned Sir Robert S. Ball, Professor S. R. Gardiner, Professor C. V. Boys, the Rev. A. Boyd-Carpenter, Miss Amelia B. Edwards, Mr. Samuel Brandram, M. Max O'Rell, Mr. J. T. Carrodus, Mr. Herbert Ward, Mr. Lawrence Kellie, Mr. Charles Fry, Mr. Eric Stuart Bruce, and Mr. Wilmott Dixon.

NOTES.

OF all times in the year, the holiday season is the worst for a railway strike,—both for the companies concerned and the public. Accordingly, a number of the *employés* on the Scotch lines have recently struck work; thereby causing a great deal of confusion, and, in some districts, a complete stoppage of the traffic. Both the passenger and goods train services have been more or less suspended for want of drivers, &c., and notices issued by the companies intimate that goods traffic can only be accepted on condition that they shall not be held responsible for delays. As the chief demand of the strikers is for shorter hours of labour, they have the sympathy of a considerable section of the general public; and the directors have further to face the fact that their neighbours, the North-Eastern, have just given way to a similar demand from their men, and thus averted a strike on that line. The officials have, however, succeeded in engaging a large number of substitutes, and seem very disinclined to give way. Seldom has the Christmas season been attended with so many inconveniences to the railway companies generally, owing to the combined influences of the severe weather and the disturbed and unsettled state of the men. To be deserted just at a moment when extra assistance is always needed at all the large stations is particularly harassing, besides the anxiety which continued frosts and fogs entail upon the officials. Added to this, the work at some of the large London forwarding depôts has been considerably retarded by sudden failures in the gas supply,—due, doubtless, to the inclemency of the weather,—and altogether the work has been carried on under the most adverse and trying circumstances. The effects, of course, are very widespread, the disorganisation of railway working involving delays to traffic for places far remote from the particular station or line primarily affected, and it is very doubtful if Christmas Day found all the traffic disposed of which should have been cleared off before the holidays.

REFERRING to the International Art Exhibition to be held at Berlin next summer, we hear that the programme drawn up by the committee in charge of affairs has now been definitely decided on, and that it will be sent out a few days hence. It is hoped that the exhibition will be an international one in the proper sense of the word, without being subject to political influence, and arrangements will be made that the exhibits of the different countries will be placed together forming distinct groups, of which the German one will alone be subdivided according to the headings, Berlin, Munich, Dresden, Düsseldorf, Weimar, and Karlsruhe. All original paintings and water-colours, pieces of sculpture, architectural designs, and black-and-white work will be eligible for exhibition; a few extra divisions for illustrated publications on art subjects, painted fans, artistically decorated documents and addresses being, however, suggested, and a few special invitations for the purpose of obtaining a select arts-and-crafts room may be issued. Prizes will be given in the form of gold and silver State medals, diplomas, and recommendations, and these are to be adjudged by a jury, the exact formation of which cannot be made out till the number, &c., of exhibitors and their nationalities can be approximately known. Measures will be taken to assist exhibitors in sending their work, and arrangements have been made as to the insurance of exhibits whilst at Berlin, the whole of which will be insured by the Committee for a lump sum not under 400,000*l*. A sales office for the exhibits will be formed, at which a commission of 7 per cent. of the sale price will be taken for office expenses. The opening-day of the Exhibition is fixed for May 1, and it will be open for four months. Architectural work will be found room for, and there is a special paragraph in the programme permitting de-

signs for buildings, &c., and also mural decoration, to be exhibited in photograph form; and there is no reason why English architecture and draughtsmanship should not be well represented at the coming Exhibition, and the English success at the last summer's Munich Art Exhibition be repeated, or even improved upon.

THE career of Dr. Schliemann (referred to more at length in another column) is a practical proof that the endowment of research is not necessary in order that research may take place. The great archæologist, having made for himself a competence in business, and having educated himself, discovered for the modern the treasures of the old world. In another sphere of work Darwin made discoveries, and gave his time to the most patient research, without any so-called endowment. We may well doubt, therefore, whether any scheme for the endowment of research would be of real practical value. If research is to be in any sense endowed, it should be by giving assistance to men who have shown the value of their work, and who, it is clear, can do yet more with adequate assistance over and above their own resources.

A QUESTION addressed by Mr. Richard Chamberlain to the President of the Board of Trade as to "a long-continued default of the Chelsea Electric Supply Company to furnish the statutory current of 100 volts, and to the serious loss of illuminating power sustained by consumers in consequence," has led to some very miscellaneous correspondence recently in the press, through which many users of the electric light make known their grievances against the particular company supplying them. Puzzling and contradictory as the letters are, most curious is the statement that the volt, or unit of the electrical pressure, is still an indefinite quantity, and hence it is impossible to determine whether a company does or does not maintain a pressure of 100 volts in its mains. This is one of these side issues in which the pseudo-scientific writer seems to delight, and which has absolutely nothing whatever to do with the main question. In the metric system, the unit of length is the mètre which is defined as the ten-millionth of the quadrant of the meridian of Paris. Owing to experimental errors in the determination of the mètre, the mètre now used is probably wrong by about one two-hundredth of an inch. Is it, then, true that if a trader in France agrees to sell 100 mètres of any commodity, the purchaser cannot determine whether or no he gets what he pays for? The "volt" is in much the same position. What is meant by the volt, that is the definition of the volt, is as clear as that of the mètre, but like the mètre it is exceedingly difficult to determine it absolutely. From what one has been reading lately it might be thought that an incandescent lamp gives its proper light at 100 theoretical-volts pressure and none other. This, of course, is utter nonsense,—lamps can be made which shall be properly incandesced at almost any pressure within limits. All a householder requires is that his supply company shall keep a pressure in their mains sufficient to properly illuminate his lamps, no matter by what particular number they may choose to denote that pressure. An electric supply company can no more keep the pressure in its mains absolutely constant than a gas company, but if the pressure never varies more than 4 per cent., it is constant enough for all practical purposes. One writer makes the excuse that volt-meters do not always indicate the same. This is true, nor does the average watch continue to indicate the right time. A man, therefore, "standardises" or determines the error of his watch by comparing it from time to time with some clock which does indicate Greenwich mean time. We learn that the House-to-House Company, which is specially commended for the constancy of its supply, periodically has its instruments checked at the Electrical Standardising Institution in Charing Cross-road, and that experience shows them that this constant checking is very necessary. Yet this does not mean that when the House-to-House Company professes to furnish 100 volts it does so to the letter. What it does is to maintain an *unknown*, and at present *unknowable*, pressure x between its mains, which x, however, is known to be very nearly 100, and is, therefore, called so. The real point is that, whatever the absolute value of x may be, the Company does not allow it to vary beyond unavoidable and inappreciable limits. This is all the public require. Nobody ever wants to know the pressure at which his gas is supplied, provided only the pressure is suitable and constant and does not make the gas-flame roar one moment and burn dimly the next. *Mutatis mutandis*, this is all the user of the electric current should ask for.

THE proposed new trunk line of the combined Manchester and Sheffield and Metropolitan Railways has always attracted much notice. Last week the Bill was approved by the shareholders of the first-named company, and it was condemned by a meeting of the residents of St. John's-wood. It is obvious that, as regards the eighty miles of new line required to unite the two existing systems, this part of the Bill will receive the approbation of a Committee of the House of Commons. It can only be opposed by the North-Western Company, and this missing link is certain to be approved. But the real fight will be over the terminus. We think good reasons can be advanced against a new terminus in St. John's-Wood. The proper terminus from every point of view is the site of the existing station at Baker-street; of course, much enlarged, and with two or four more additional lines of rail. But it will be necessary that the arguments should be placed before the Committee on this point, and we can scarcely think that they will attach much weight to the artists' plea that St. John's Wood is a secluded residential suburb, since, as a matter of fact, it is a general residential suburb, among the residents in which artists are by no means in a majority.

AN important fact in regard to the wear of railway rails is notified and illustrated in the last number of the *Engineer* (quoting, however, from the *Railroad Gazette*). Two sections of the same rail are given showing the comparative wear of the rail, in a period of seven years, in a tunnel and on the open railway. The difference is very remarkable. The rail laid in the tunnel has lost nearly half the area of the lower flange, the rounded extremities are pared down to knife-edges, and about one quarter of the area of the upper flange is eaten away, more on one side than on the other, leaving an irregularly-shaped mass. This alarmingly-increased wear and disintegration in the tunnel is of course due to atmospheric causes; but if this case is taken as establishing the general tendency of rails to behave in this way in tunnels, it is a fact of serious importance in regard to the laying and maintenance of tunnel roads. A tunnel is exactly the place where one may suppose that a defective condition of the rails might most easily escape observation; yet it appears that this is where it is most likely to occur within a given space of time.

THE recent annual report of the Metropolitan Public Gardens Association gives evidence that that most useful Society keeps steadily at work. The efforts are the more praiseworthy because it has to meet with many rebuffs. It is in many ways ubiquitous. While the Society is properly endeavouring to induce the Charity Commissioners not to appropriate for other purposes the fund hitherto used for keeping up St. Botolph's Garden, Aldersgate-street, it is preparing to lay out Sidney-square, Commercial-road, and to secure a particular open space in Bromley. Its continuous and judicious efforts have improved the appearance of the metropolis, and have added to the health of many of the inhabitants of London, and not a little to the small enjoyments of hundreds of the old and young of the poorer classes. No society deserves greater sympathy and support. Of the architectural value of the work done by it, there is no stronger proof than the advantage to the Law Courts of the laying-out of the open space at the west side. There is, indeed, no question that it would be a first-rate metropolitan improvement if the houses of Bell-yard and of the west side of Chancery-lane were demolished, and the space between the Courts and the east side of Chancery-lane left open, and handsome buildings erected in place of the miserable erections which now run up the lower end of the east side. But whether public spirit will ever carry this improvement is a matter of doubt. It is equally certain, also, that the south side of New-square, Lincoln's-inn, ought long ago to have been demolished, and then there would be one of the finest open spaces of London, with the Law Courts at its southern end. The public spirit of the Honourable Society of Lincoln's Inn will, we hope, one day effect this much-needed improvement.

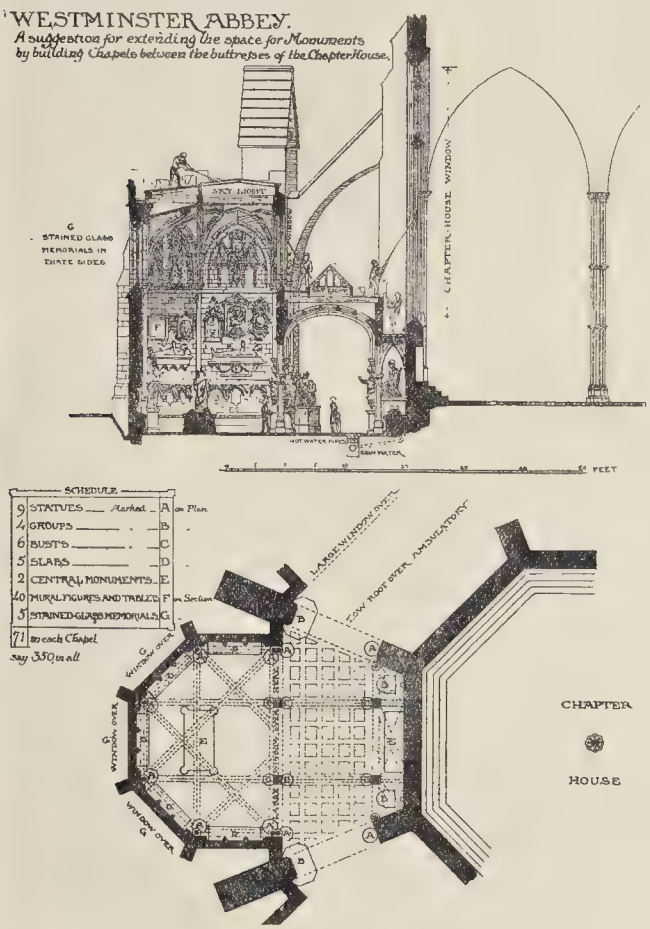
IN another column will be found a report of the case of the London County Council *v.* Knowles, in which the question was raised, "What is a permanent structure?" The case is interesting from the fact that the magistrate (Mr. Mead) distinctly laid it down that in his opinion structures which come under the heading of plant, and which are erected in such a manner as to last the term of a lease of twenty-one years, are "permanent." This decision will have an important bearing on many businesses.

IN Mr. Spear's Report to the Local Government Board upon the "Sanitary Condition and Administration of the Pembroke Rural Sanitary District" it is stated that the district was visited by Dr. Airy on behalf of the Local Government Board, and in connexion with a serious outbreak of diphtheria in the village of Jamestown in 1880. In 1885, when an invasion of cholera was anticipated, the district was again inspected on behalf of the Board by Dr. Davies. On that occasion he reported that no regular means of drainage existed; that roadside gullies served as slop-water drains; that privy-pits or cesspools, often dangerously near sources of water supply, were in general use, and that many houses possessed no privy accommodation; that no public arrangements for scavenging existed; that water was chiefly derived from wells requiring protection from pollution, and that the cottages of the poor were often damp and ill-ventilated. The report proceeds to state that various recommendations have been made from time to time by the medical officer, to the local authorities, with little result; and describes the present condition of things. The old difficulty about efficient removal of refuse turns up here again. At Neyland, we read—

"No sewers have been provided, and sewage is discharged into any convenient gutter, or is thrown on to the open spaces about the dwellings, so that practically nuisance from this cause is universal. Deep privy middens or cesspits are in general use, and there are many instances of very close proximity of these structures to the dwellings. There is no public provision for the removal of refuse, and the people have evidently great difficulty at times in securing its removal. When undertaken by a farmer or carter, the work, moreover, is not done gratuitously, *and careless tenants will allow large accumulations to take place, rather than defray the cost.*"

This is one of the worst and most frequently recurring evils in the insanitary history of country districts, and it is one in regard to which further and stricter legislation seems urgently called for.

FROM a letter of Mr. Tarver's, printed in another column, it appears that we unintentionally misrepresented his proposal for an addition to Westminster Abbey, in referring to it as approached from the Chapter House. The block plan, representing a series of small chapels radiating from the Chapter House wall, produced this impression, and in order to set Mr. Tarver right we reproduce his detailed plan and section, which we had



Mr. E. J. Tarver's Plan for adding Monumental Chapels to Westminster Abbey.

overlooked, showing the arrangement he proposes. The idea is that these chapels would form recesses for monuments in the same way as the bays in Henry VII.'s Chapel; and that the door at Poet's Corner being done away and left only as an open doorway, the chapels thus formed would be actually within the building as altered. This puts the suggestion, of course, in quite a different position from a scheme using the Chapter-house itself as an approach, and is therefore not open to the objection we raised on that score. We do not recommend it for adoption, because we hardly consider it is a sufficiently important and dignified manner of providing the space required, and it would result in putting the monuments rather too much away in a corner, and would somewhat encumber, architecturally, the exterior of the Chapter-house. But it is at all events a very ingenious suggestion, and we have pleasure in publishing it as such.

EVERY reader of the *Times* is aware of the wonderful versatility and intrepidity of the Paris correspondent of that journal. There is apparently no subject on which he does not feel called upon to enlighten the public. But, unless he be the victim of translator, telegraph clerk, or printer (or of all three combined), he had better leave engineering topics alone. His latest achievement in this line is with regard to the proposed Channel Bridge. Writing on the 26th of December (see the *Times* of the 27th) he details with great circumstantiality what he says are the latest results of the survey of the Channel, and states that M. Renaud, the hydrographic engineer, has come to the conclusion that the most advantageous line for the bridge is not that fixed on in the preliminary scheme:—

"The line he recommends is straight. It starts from a point 350 mètres north-east of the light to the west of the South Foreland, and it terminates 300 mètres north-east of the entrance of the tunnel near Cape Grisnez. Its length is 33,450 mètres. The greatest depth of water met with on the line was from 50 to 51 mètres, a depth extending only over a distance of 1,700 mètres. The length of the bridge along the line now proposed is shorter by 5,150 mètres than that suggested in the preliminary scheme. Moreover, it avoids depths of 55 mètres, and those over 50 mètres extend only over a comparatively short distance."

A little further on, he says:—

"As regards the bridge itself, the line being shortened and the height of the piles diminished in consequence of the greater shallowness of the water through which it passes, considerable diminution of expense is secured as compared with the first scheme. Instead of four millions of mètres cube of masonry there will only be three-and-a-half millions. About 50,000 *millions of tons of metal* will be saved. Lastly, there will be 92 piles instead of 112, and of these 92 piles 17 will be sunk in depths of 30 to 40 mètres, 31 in depths of 40 to 50 mètres, and the others in depths of less than 30 mètres."

The italics in the last paragraph are ours. If fifty thousand millions of tons of metal will be *saved* by adopting the shorter route, we should like to know how many "thousand millions of tons" of iron will be required for the erection of the bridge, even by the shorter route? By "piles" we presume "piers" are meant. As our readers will know, they are very different things. Fortunately for the resources of the iron-producing countries of the world, to mention no other consideration, this scheme is even less likely to be carried into execution than the Channel Tunnel.

AMONG the trials of the winter many persons count "smoky chimneys." There is scarcely a country house to be found which does not contain a room with this nuisance. But in seeking to remedy this troublesome defect, care must be taken that the remedy is not worse than the disease. The small builder at once prescribes a cowl, and as soon as it is up the householder fancies that nothing more has to be done; on the contrary, this piece of machinery must be kept in good working order. A correspondent informs us that a chimney in his house had on it a cowl, placed there, as the lawyers say, by a "predecessor in title," and that the room which it served was occasionally subject to "smoky chimney" in a mild form. One windy night the cowl blew off, and since then the disease of "smoky chimney" is unknown in that room. Another room recently took the disease badly, and on examination it was found that the cowl had set itself obstinately to face the wind. As soon as it was made to move in a normal manner, the disease left the room. Our correspondent would have done well to see that the cowl was in working order at the beginning of the winter, but the example shows that the mere receipt of a cowl to cure a smoky chimney is not sufficient.

AN article on "Bookbinding" in the *English Illustrated Magazine*, by Mr. Cobden Sanderson, is worth attention, in spite of its very self-conscious character. The examples of binding from the author's own work are beautiful, and, along with some of the remarks on the subject, serve to illustrate the manner in which the subject of a book may, in a kind of far-off symbolical fashion, suggest a character for the design of the cover. Thus the broad bands of daisies which decorate a beautifully-bound "In Memoriam" were suggested by the line in "Tithonus"—

"The grassy barrows of the happier dead"

(not from the poem in the binding, by the way); and the binding of "Atalanta in Calydon," with its flame-like growths, was suggested by the passage in the poem in which Althæa describes her dream of the firebrand. In regard to the nature of the design which is to be placed on a book-cover, we are glad to see that the author of the article speaks strongly against naturalism, and ridicules the idea that "a natural spray or flower may be tooled on the side of a book, so as to appear as if thrown down carelessly." As Mr. Cobden Sanderson justly says, it is the object of design to recast and redistribute nature, to invent something on the basis of nature, so that "it shall be an organism whose parts have symmetrical relationship one to another, on a plan of his own devising." If, instead of doing this, the artist contents himself with copying a natural spray, "he will be developing his own dissolution and the dissolution of his craft." This, and a good deal else in the article, is exceedingly true and well put. It is a pity that, while admitting this, one should have to be annoyed at the bad taste of heading the article with "a view of Mr. Cobden Sanderson's workshop," which is of no interest in itself, and certainly has no bearing on the elucidation of the subject, and which comes

oddly from a writer who in the course of the article speaks of "this advertising age." Still more extraordinary is the fashion Mr. Cobden Sanderson appears to have set up of dedicating bindings to his children, by tooling the name on the cover, so that in the middle of the cover of a Homer we are astonished to read "Richard" on a blank space of the design. It does not appear quite clearly whether this was merely on the study for the design, or whether it is actually introduced on the bookcover itself; but we are led to conclude the latter. If it is so, we do not know whether to wonder most at the bad taste of the artist who does this, or the complaisance of the client (of course we must not say "customer") who allows it.

LETTER FROM PARIS.

MUCH has been said recently about an endeavour to re-unite the two camps into which the Paris artists have become divided. The division which took place openly during the past year was, however, in reality one of long standing, and the question of the awards in the Universal Exhibition was really seized upon as a convenient pretext for secession by the artists who now make up the Salon Meissonier. But the idea of a possible re-union has at all events given additional interest to the triennial election of the Committee of Direction, the "quatre-vingt-dix," as they are called, as upon the composition of that Committee depends the question of peace or war between the two factions.

All the old members, however, have had their powers confirmed anew. The section of painting still includes MM. Bonnat, Tony Robert-Fleury, Jules Lefebvre, Benjamin Constant, Détaille, Merson, and Barrias; that is to say, the most ardent and irreconcileable opponents of the new Salon; and it is the same in the departments of sculpture and engraving: so that it is not likely that the year 1891, at all events, will see the desired reconciliation brought about. This is more especially to be regretted in regard to its influence on the funds for infirm artists, which are seriously impaired under the present state of things. Another consideration is, as M. T. Robert-Fleury has observed in a recent report, that the artistic supremacy of France is seriously threatened by the growing power of the Munich annual exhibition.

As to architecture, which in the annual Salons forms a kind of inner party of its own, taking little heed of these disputes among the other ranks of artists (in fact it has hardly any footing in the Salon Meissonier), we find it represented in the new Committee of Direction by MM. Vaudremer, Charles Garnier, Coquart, Bailly, Daumet, Pascal, Ginain, Alfred Normand, Laloue, and Loviot.

The Government also, on its part, is occupied in trying to make up the quarrel; but MM. Bailly and Bouguereau have protested against this, and M. Meissonier seems averse to any truce except on conditions almost entirely in his favour. To these feelings of hostility are added more practical difficulties. The old Salon is threatened by the Municipality, which wishes to regain possession of the Palais d'Industrie, and the Salon Meissonier is also in considerable perplexity as to the scene of its future exhibitions. The Union des Arts Décoratifs, represented by M. Antonin Proust, is urging the Municipal Council for the use of the Palais des Beaux-Arts for its exhibitions; and M. Meissonier, great painter as he is, is but a very simple-minded tactician, and has not succeeded in defending his right of priority in the matter. The probability is therefore that the Union will carry the day, and the Salon Meissonier will only obtain the galleries, if at all, at the cost of a heavy rental.

The Musée des Arts Décoratifs is in the way of prosperity in every sense. Its collection now includes not less than 3,000 pieces of gold and silversmiths' work, ceramics, sculpture, objects of ecclesiastical art, and textiles. It is therefore rather straitened in its present quarters, and M. Proust has indulged that ambition of making the Palais des Beaux-Arts a kind of "South Kensington" museum for Paris, in which the architectural treatment of each room is to be carried out in accordance with the general date and character of the collection contained in it. If he succeeds in his aim, some of the architects may therefore look to have a very interesting task to carry out.

The recent discussion of the Fine Arts budget in Parliament has served as a pretext for some sharp criticism on the management of the Louvre. The Minister of Fine Arts has characterised these criticisms as mostly trivial and uncalled for. There has been especially a dead set made at the mosaic decoration of the Escalier Daru, the demolition of which has even been demanded on the ground that it is a discredit to the art of the present day. The architectural treatment is copied from the church of St. Martin at Cologne, a piece of pure Romanesque of the eighth and ninth centuries.

We have before spoken of the decorative painting of this staircase, in which the France, Germany, and Flanders of the Renaissance are represented by figures executed from the cartoons of M. Lenepveu. The cupola is now nearly completed. The vault is completed in mosaic and the walls are veneered with marbles. The landing is reserved for the representation of modern art, and the antique will be symbolised in another portion of the decoration, in the shape of medallions containing portraits of Pheidias, Vitruvius, and other celebrated names in ancient art. The scheme, originally drawn up in 1886 by M. Guillaume, the architect, is therefore an important and very complete one, and it is to be hoped that the Chamber of Deputies will know better than to interfere with its completion.

M. Carolus Duran's ceiling painting, "The Triumph of Marie de Medicis," before referred to, has also had the misfortune to displease the Fine Arts Budget Committee, though in general it is regarded as a very successful and effective piece of work.

There is still however much to be done to complete the decoration of the Louvre, about which the director, M. Kaempfen, is very much in earnest, in spite of these Parliamentary criticisms. He has just had the idea of bringing together, in one gallery, all the works in metal which were formerly scattered about in various corners of the building, and some of which, in fact, for want of proper space and arrangement, have never been exhibited at all. He has thus formed, in a room on the first floor, a fine collection of this class of work, which will shortly be opened to the public. In a large glass case which occupies the whole of one end of the room, are arranged the statuettes, the salvers &c. of German and Venetian work, clocks and chandeliers. Among these works there is especially to be noted an "Arion" by Riccio, two figures attributed to Michelangelo, the chandelier from the Montmorency Chapel, firedogs decorated by John of Bologna, bronzes by Donatello, and some splendid examples of wrought iron work. Side by side with rare bronzes of the sixteenth and seventeenth centuries, ecclesiastical furniture, arms of various kinds, we find also the "Frileuse" of Houdon and animal subjects by Barye. The arrangement of this gallery, which has been entitled the "Salle de la Ferronerie," does the greatest credit to the taste and discernment of the curator of the Renaissance and Mediæval sculpture department.

The Cluny Museum continues to add to its collection, and has just opened a new gallery containing works of the thirteenth, fifteenth, sixteenth, and seventeenth centuries, collected during fifty years by Isaac Strauss, the former well-known composer and *chef d'orchestre*. This collection was offered to the State by the Baroness Nathaniel de Rothschild. The Guimet Museum, the interest of which is also continually increasing, has just received the whole collection of Asiatic ethnography formerly in the Trocadéro; and there is some idea of presenting to it also the objects of the same class which are now in the Musée de Marine and at Fontainebleau, and which illustrate the religious history of the extreme East.

The Municipal Council of Paris, which has deferred so far its usual purchases from the Salon, has just voted the purchase of a certain number of works of painting and sculpture which figured in the two Salons of last year. In sculpture it has selected the statue by M. Labatut representing the last moments of Cato, the "Nymphe lutinant un Dauphin" by M. Larroux, the "l'Archimède" of M. Vital Cornu, and the "L'Amour" of M. Demaille. Besides several paintings, the Council has also purchased a vase in the Renaissance style by M. Barré. This is a new step, intended to indicate that the Municipality intends for the future to recognise works of industrial art as worthy of encouragement by purchase, as well as works of painting and sculpture.

The decoration of the Pont de la Concorde has come up anew for discussion. The municipality wish to decorate it with statues of the philosophers of the eighteenth century and the great men of the Revolution. The idea is not new, as there may be seen now, in the great court at Versailles, the statues which for some time adorned the pedestals at each side of this bridge. If the scheme is carried out, the sculptors of to-day will have some fine opportunities before them, and the decoration of the Place de la Concorde will be happily connected with that of the façade of the Corps Législatif.

We have before spoken of the prize offered by M. Osiris to the architects and engineers who took part in the erection of the Galerie des Machines. The committee entrusted with the matter have decided that in addition to the prize or premium, there should be a commemorative medal to the constructors and artisans employed. M. Chaplain has been commissioned to execute the medal, which represents an artisan in ironwork seated on an anvil and leaning on his hammer; a genius places a wreath on his head. On the second plane of the medal various utensils are grouped, and as the ultimate background or "fond" is a long perspective of iron girders. It is a work which does great honour to the eminent artist who has been entrusted with it.

The Conseil Supérieur des Beaux-Arts, which met a few days ago, has unanimously voted the maintenance of the ateliers of the school. The Council is always occupied with the question of admission to the ateliers so vehemently demanded by the "Union des Femmes Peintres et Sculpteurs." Though favourable on principle to the improvement of the artistic education of women, the Council considers that it would be out of the question to admit women students to the ateliers of the Rue Bonaparte, and that they must have a distinct locality; an opinion which has already been expressed in touching on the subject in a former letter. If women are admitted to the course of the Ecole, therefore, it will be in such a way as will separate them entirely from the existing studios with their exceedingly unconventional standard of manners.

An interesting experiment in decentralisation of artistic training has just been made by a certain number of pupils of the École des Beaux-Arts who have quitted the schools to found, in the Rue Campagne Première, a free academy which is to include every year an exhibition of the works of the pupils, who will not receive either medals or other prizes. If the experiment answers the example may become contagious, and the official establishment of art instruction may suffer somewhat in consequence.

The following are the results of the last competitions in the École. For the exercises in the course of architectural history the jury have awarded medals to MM. Proy and Mercier, pupils of M. Raulin; to M. Delabarre, pupil of M. Moyaux; to MM. Du Pasquier and Garnier, pupils of M. Blondel; and to M. Friedlandel, pupil of MM. Daumet and Girault. The "prix de fin d'année" has been awarded to M. Chiffiot, pupil of MM. Daumet and Girault, for the restoration of the façade of the church of the Collège de l'Arc at Dôle. The same student has obtained the "grande médaille d'émulation" for 1889-90.

In the competition in decorative composition among students in painting, sculpture, and architecture, a "troisième" medal has been awarded to M. Adolphe Lerolle, pupil of M. Peigney (architect). His brother, M. Louis Lerolle, pupil of the same architect has obtained a "seconde troisième" medal. In the "Concours de Rome" for 1891, the dates of the first and definitive competitions for the three branches of students are now published.

Several artists of talent have died during the past month, the best known among them being the painter Eugène Lami. He was born at Paris in 1800, and has therefore lived to an unusual age, retaining all his faculties and even his artistic power almost to the last, for last year he exhibited at the "Galerie des Aquarellistes." He had been a pupil of Gros and of Horace Vernet, and entered the Ecole des Beaux-Arts in 1817. He received medals at two or three different exhibitions, among others at the Universal Exhibition of 1855, and was made Officer of the Legion of Honour in 1862. After having started as a painter of historical and military pictures, he became subsequently a recognised master in

scenes of modern fashionable life. The gallery at Versailles contains several of his battle pictures. The Luxembourg contains some very fine water-colour pictures in his later style, among others one representing the fête given by Napoléon III. to Queen Victoria. His talent was much appreciated in England, which he frequently visited, and the Rothschild family possess a considerable number of his works. Lami, whose illustrations to Alfred de Musset's works, to Gil Blas, and to Manon Lescaut, are celebrated, was during his whole career a *persona grata* in the aristocratic world, and he will retain an important place in the history of French art in the nineteenth century, through the greater part of which he has lived.

The painter Théophile Gide, who is also dead, was especially a painter of religious subjects. He had studied under Paul Delaroche and Léon Cogniet. He had exhibited since 1850 and obtained various medals, and the Cross of the Legion in 1866. The museums of Angers, Amiens, Alençon and Roubaix, as well as the Luxembourg, possess examples of his work, rather hard in texture and monotonous in colour. He died at the age of sixty-eight.

The painter Emile van Marcke, who has died suddenly at Hyères at the age of sixty-three, had been a pupil of Troyon, and, like him, gave himself mainly to the representation of cattle. He painted animals and landscape with the same truth and sincerity, but always with an equable kind of excellence and with no novelty or originality. He had obtained various medals for excellence of work, and had always the esteem of other artists.

Another painter deceased during the month is Hippolyte Dubois, who had attained a certain degree of celebrity and obtained a medal in the Salon of 1866 and a bronze medal in the 1889 Exhibition. He died at the age of 59, in the Hôpital Beaujon.

Eugène Louis Charpentier, whose death has also to be recorded, was a painter of historical subjects, and battle-pieces, and studied under François Gérard and Léon Cogniet. His works are in various public museums, especially those of Lyons and Boulogne, and there is a picture of his at Versailles, representing the Duc d'Orléans before the town of Antwerp. He received a medal in the 1841 Salon, and the cross of the Legion of Honour in 1857. He was 79 at the time of his death.

We may terminate this too long obituary record by the notice of the death of a sculptor who was celebrated at one time, though little known to the present generation. This is Auguste Marie Ottin, who has died at the age of 79 at the retraite Galignani. He studied sculpture with David d'Angers, followed the course of the École des Beaux-Arts, and obtained the Prix de Rome in 1836. During his sojourn at the Villa Médicis he undertook a great many works which popularised his name rather in Italy than in France. Among the best known were his "Amour et Psyche," the "Chasseur Indien," and "Hercule au Jardin des Hesperides." There is attributed to him also the group of "Polyphême Suprenant Acis et Galathée," which adorns the Médicis fountain at the Luxembourg. A few years ago the Municipality of Paris purchased from the Salon a rather mediocre bas-relief of his, symbolising the Triumph of the Republic. He obtained a second medal in 1842, a first one in 1846, and the Cross of the Legion of Honour in 1867.

RETIREMENT OF AN OLD "READER."—One of the oldest "readers" in London has retired from the service of the Hansard Publishing Union. Mr. John Bate, who had been employed in the firms of Cox Brothers, Cox & Wyman, Wyman & Sons, and the Hansard Publishing Union, for nearly forty-two years, having recently sustained a severe bereavement, has decided to retire. Mr. Bate, for upwards of thirty years, "read" the *Builder*, under the editorship of the late George Godwin, and for some years has been the senior "reader" in the above-named establishment. He has on various occasions been thanked by the firm for the services he has rendered, both as "reader" and in other ways; and the respect in which he has been held by the employés has often been demonstrated. So long back as 1848 Mr. Bate had the "reading" of the *Law Times* and other publications belonging to the late Serjeant Cox; and numerous other works and serials have passed through his hands. We trust the firm will show their appreciation of Mr. Bate's long and faithful service in the shape of a pension, or in some other tangible way. We are sure he will be followed in his retirement with the heartiest good wishes of all who came into contact with him. —*Printing Times.*

THE WOODEN THRONE IN CANTERBURY CATHEDRAL.

ATTENTION has lately been attracted to this interesting piece of old wood-work, and it has been disinterred, from the place to which it was consigned in 1842, when it was removed from the Cathedral Choir, to make room for the present stone edifice, given by Archbishop Howley. Archbishop Tenison gave the throne in 1706 as the final step in the refitting of the choir which had commenced in 1676. Curiously enough there is no mention of the throne in the cathedral records, though all other pieces of the work, from the wainscot to the new pews, have their date and cost entered in both Dean and auditor's books. But there is no record either of the Archbishop's gift or of any vote of thanks to him for it by the Chapter, as it seems to have been considered his affair, and his only. Somner (antiquities, 1640) mentions the older throne as "the Archbishop's wooden seat or chair; sometime richly gilt, and otherwise well set forth, but now nothing specious through old age and neglect. It is a close seat made after the old fashion of such stalls, called thence Faldistoria." Dart (1727) speaks of a new throne being placed in the room of this seat, but says nothing of either donor or workman.

The authority for it being the work of Gibbons is Vertue's diary, quoted by Walpole, "Archbishop Tenison built a decent and beautiful throne in the choir of Canterbury Cathedral, the carving work done by Gibbons, the cost of the throne, 70*l.*" Gostling, writing in 1777, objects to this, and says, "In the Biographia Brittanica the expense is said to have been 244*l.* 8s. 2d., which seems more likely than only 70*l.*, at which the honourable Mr. Walpole rates it, and says the carving was by Gibbons. This, perhaps, may be doubted, as nothing here seems the work of so eminent an artist."

The remains at present consist of six Corinthian columns, and the triangularly planned cornices in which they were set, the back and sides of the seat, which are plain wainscot, and the various parts of the canopy, which rose to a considerable height above the seat, as well as the mitres and pinnacles by which it was adorned. In Nash's drawing of the choir in 1805, there is a good picture of the throne, showing that this canopy was a kind of open arch, leaving a clear space above the back of the seat, through which the pillar in the transept-wall can be seen. It was joined to the cornice above the pillars by a carved scroll, which has unfortunately disappeared, as have the five carved shields which formerly hung from the front of the canopy.

The whole canopy is exceedingly awkward and clumsy in construction, and when adorned with mitres at front and back, and pinnacles at the two sides, must have been rather grotesque than beautiful. None of the work is in Gibbons' own special style, as wreaths and festoons of foliage are conspicuous by their absence; but the pinnacles, though their bases are heavy, and somewhat bare, are finished with clusters of flowers and tall, upstanding leaves, which are wonderfully light, graceful, and free in arrangement.

In the same way there is a border of small cinquefoils at the top of the cornice, which stand out clear and lifelike in a fashion perfectly distinct from the leaves and conventional patterns of the other borders, and the acanthus leaves of the capitals have the clear, fresh cut which is one of Gibbons' characteristics. May one venture to surmise that the sculptor found the whole edifice designed, and was only able to adorn some parts of it, as the plan did not lend itself to ornament? If the main part of the erection was the work of a local and unknown man it would account for the small sum which it cost, according to Vertue, or, perhaps, Gibbons had 70*l.*, while the total cost was 244*l.* 8s. 2d.

As might be expected, the throne has suffered from forty-eight years' neglect, and when re-erected as at present contemplated, the damage will be apparent. As before said, the five pendent shields, which hung from the canopy, as well as the scrolls which joined canopy to cornice, have disappeared, though there is still a hope that the latter may be found. The triple row of carved acanthus-leaves round the capitals have in many cases lost their curling fronds (if such a term is allowable). Enough remain to show how beautifully they were cut, and how boldly they stood out from the pillar; but the high relief, which is their beauty, has also been their ruin, as in most cases a very slight knock has been enough to break them off.

Nothing has yet been settled about the place of re-erection, as of course it would be out of the question to replace the throne in the choir, whence all the wainscot of classical pattern, with the exception of the Dean and Prebend's stalls, has been removed. The Cathedral library is talked of, or possibly some place may be found for it in the Cathedral, though not in the choir. At present the various fragments are being cleaned and renovated, and the six columns are already safely housed in the Cathedral library.

Illustrations.

CANTERBURY CATHEDRAL.

IN regard to the view of Canterbury Cathedral given in this number, the first of a series of illustrations of the Cathedrals of England and Wales, a few words are necessary in the way of what in the House of Commons is called "personal explanation."

In the first place I wish it to be understood that the placing of a drawing of my own as the first in the series was quite contrary to my intentions, and only the result of peculiar circumstances. Three months ago one of the ablest and best-known architectural draughtsmen in London accepted the commission to prepare a drawing of Canterbury, but about the time when I expected to receive the drawing I received only a letter regretting that temporary ill-health had rendered it impossible for him to complete it. Another very well known artist then undertook it, though on rather short notice, and a week after he was compelled to leave England owing to the sudden death of a near relative abroad. Under these circumstances I preferred to undertake it myself rather than ask any one else to do so under the disadvantage of pressure of time.

The original drawing was prepared in pencil-line and lightly tinted in Indian-ink, a method adopted as one of the quickest that could be employed where time was short. Unfortunately the "ink-photo" process, the only one which there was time to employ, is not calculated to reproduce satisfactorily the rather delicate effect of this method. Consequently some detail is lost in the reproduction which was clear enough in the original, and "values" of tint are in other places much exaggerated. I am desirous that this drawing may be reproduced again by a different and more delicate process, in order to take its place better in what it is hoped will be a valuable series. In the meantime I must ask the candid reader to believe that some at least of the deficiencies of this illustration are inherent in the process employed, and not in the original drawing.

H. H. STATHAM.

The view here given of Canterbury Cathedral is taken from a point which is not actually accessible on the site. The south-west angle of the precinct is in fact the only one from which a general and comprehensive view of the greater portion of the building can be obtained. But for the purposes of a drawing the furthest point attainable within the precinct is too close, and includes too large an angle of vision. At the south-eastern portion of the precinct there is space enough for a comprehensive view, but the fine trees which in one sense form so great an addition to the general picturesque effect of the cathedral shut out too much for a complete architectural view, in which in any case the western towers would be reduced to a very subordinate position. The view of the central tower and part of the cathedral from the cloister on the north side is magnificent as a picture, but loses again a great deal of the architecture. Taking the south-west view therefore as the only comprehensive one, the main lines of the building have been set out from a plan, as they would appear from a point of sight some little distance beyond the precinct. The principal heights, those of the towers, the roof ridge, eaves, &c., have been in like manner set out from the heights given in Britton's Geometrical Elevations and Sections, which in regard to these principal measurements may safely be assumed to be correct. The details have then been filled in partly from sketches on the spot, so far as the recent inclemency of the weather

permitted, partly from photographs, used, of course, only as memoranda of the actual facts of detail, which could thence be drawn according to the assumed position of the spectator. Nothing in the drawing is copied from a photograph. Photographs are invaluable as memoranda, but illusive as representations, owing to their constant tendency to distort and misrepresent proportion.

It will thus be recognised that considerable pains have been taken to obtain accuracy of representation, and it is believed that the view of the cathedral here given may fairly claim that merit, so far as a building of such size and multiplicity of parts can be represented on a small drawing. For it is one of the most impressive characteristics of Canterbury Cathedral that it seems not so much a building as an assemblage of buildings. Promontory after promontory opens out as you walk round it eastward; the eastern end by itself, necessarily lost here behind the Norman transept, is a grand study of piled-up masses, and the small tower at the re-entering angle of the choir aisle and the eastern transept, seen at a distance in the drawing, contains on a near view enough of rude but powerful detail to make a picture in itself—a picture which we may be able to give on a future occasion.

The plan which we have the privilege of publishing is a very complete and painstaking one, and reflects the highest credit on the care and ability of the architect, Mr. George Smith, of Canterbury, who drew it from actual measurements a few years ago. The plan, nearly twice the size of this reproduction, now hangs in the Cathedral Library, and our readers will no doubt feel that they, along with ourselves, have reason to feel much indebted to the Cathedral authorities for permitting the publication of a plan which affords so valuable a record of the architectural history of the Cathedral.

Mr. Smith's plan, it will be seen, distinguishes the dates of various portions of the building by varieties of shading. But the mere fact that this portion is of the Norman period and that portion belongs to the thirteenth century &c., easily enough perceived from the plan, does not in itself bring out the true meaning and history of these changes. Let us endeavour in a few words to sum them up here.

The foundation of the archiepiscopal cathedral dates from the time of St. Augustine, its architectural foundation in a sense probably from before that time, since it is recorded that St. Augustine made use in the first instance of a church which had been constructed already by Roman converts to Christianity. This was enlarged subsequently in 950, but when Lanfranc, abbot of Caen, one of the strong, gifted, and energetic characters who shine out from time to time in the history of the mediæval church, was appointed Archbishop of Canterbury towards the latter part of the eleventh century, he found the ancient church in so ruinous a state that he, in 1070, pulled it down and commenced an entire rebuilding. Of the ancient church thus removed it is not probable that any fragment now exists. Having been originally built under Roman influence, it probably was of the Roman basilica type, with colonnaded aisles and an eastern apse.

Lanfranc's church extended to less than half the length of the present cathedral, the tower being in the same position as now, and the masonry of Lanfranc's crossing piers being probably now existent within the body of the crossing piers as they now appear; as is indicated on the plan. The nave probably did not extend so far west as the present one by a good deal. The western transepts were on the site of the present ones, in which also some of Lanfranc's building is incorporated. These transepts, according to the almost universal custom of the period, would have an apse on their eastern side, and the choir would have terminated eastwards in a larger apse extending perhaps 50 ft. or so east of the crossing.

Lanfranc built from necessity, as the church to which he was appointed was ruinous. But twenty years after his church was completed came another great alteration and extension arising purely out of that enthusiastic passion, at once religious and architectural, which again and again in the history of Mediæval architecture led to the sweeping away of building that was in perfectly good condition, in order to replace it by something nobler, more ambitious, and more in accordance with the advanced architectural ideas of a new generation. The work done under Lanfranc's successor Anselm, is probably that shown in black on the plan. Looking at the plan of the crossing piers, on the east side, it will be seen that Anselm, or those who worked under his suggestion, commenced by slightly widening the choir. They built a new eastern transept, and beyond it the two towers or chapels inclining inwards towards these towers, being really tangents to the large apse which completed the building eastward, and on the centre line of which was the Trinity chapel, on the site of the present one of that dedication, but which is not the original structure. This stage of the work is connected most especially with the names of the priors Ernulf and Conrad, but more especially with that of the latter, who is supposed to have been the real designer and master of works of the choir which bore his name, and which, in all its pristine glory, was the scene of the murder of Beckett, or at all events of the savage attack which was the prelude to it. But this "glorious choir," as it was called, was short-lived; it was destroyed by fire, beyond possibility of restoration, in 1174. Then came in the reign of William of Sens, who rebuilt the choir of loftier proportions than before, as it now stands. He died before his work was completed, and his successor, an English William, completed the eastern portion of the church as it now stands. And here we are in a position to appreciate the reason for that curious narrowing of the walls of the existing presbytery as we come eastward, which gives such a peculiar character to this portion of the interior. It is the influence of the older building on the later one. It was not desired to disturb or remove the two towers which had flanked the old apse, so the new choir was narrowed to get between them, and also to bring the rebuilt Trinity Chapel on the same site as the original one; a remarkable instance of the adapting power of the Mediæval builders, in turning a practical difficulty into a new source of the picturesque.

All this time the nave of Lanfranc had remained as it was, the cathedral being in the condition in which several of our cathedrals have remained, of having an Early nave and a later and more elaborate choir; the choir, the most sacred portion of the building, being always the first to be taken in hand in any scheme for improving and heightening the architectural effect of the building. But as Lanfranc had been compelled to build anew purely on account of the ruinous state of the church as he found it, so in turn his own nave was found at the close of the fourteenth century to be so dilapidated that rebuilding became a necessity. As far as the exterior is concerned this is probably to be regretted, for the rather weak Gothic of the present nave is not of great architectural interest; but the lofty interior with its fine vault is far superior to anything that could have been done in Lanfranc's time; partly of course on account of its very height, for Lanfranc's nave must have been much lower. The latter appears to have been demolished about 1378, but the rebuilding was not commenced for some years later. The great central tower belongs to the same architectural movement, so to speak, though it was probably not completed till a good deal after the completion of the nave. The piers were thickened and strengthened very materially to carry the tower. The central tower now stands as it was left, or nearly so, the ravages of time and weather alone having affected its appearance, by no means for the worse as far as picturesque effect is concerned. The western towers were recased, the northern one to a great extent rebuilt, in the earlier part of the present century. To some extent this is perhaps a gain to the general effect, for their smooth and finished appearance gives by contrast a greater effect to the rugged weather-beaten grandeur of the central tower, which is remarkably bold in detail for the time at which it was erected, and specially remarkable for the fine and effective treatment of the angles, with the series of strongly-marked vertical lines formed by the radiating buttresses or rather (if one may use the word of a Gothic building) pilasters, for that word more correctly represents their function, which is purely architectural and not constructive. The plan of this angle is unusual, and as far as can be judged by the eye appears to be a portion of a hexagon, the buttresses radiating from the centre. The buttress next the face of the tower joins the wall-plane at an acute angle, giving a sharply-defined shadow, as shown on the southern face of the tower in the drawing. The restorers of the western towers seem to have had the fancy, so common in Italy as to be almost a characteristic of Italian towers, of leaving all the putlog holes unfilled, a circumstance which adds a certain amount of character to them.

Looking at the view once more, we see these restored towers nearest to us, and the nave with two or three of the buttresses refaced, making a strong contrast with the rugged state of those that have not been so treated. Beyond is the western transept on the foundation-lines of Lanfranc's transept, but transformed into a piece of Late Gothic, and beyond that the plain unadorned mass of the eastern transept of the time of Anselm (probably) with its curious and rather foreign-looking tower or campanile.

VIEW IN WESTMINSTER CLOISTERS.

THIS is one of the most interesting and effective bits of architectural scenery in London, and one which we have long entertained the wish to publish an illustration of. The east walk of Westminster cloisters is in itself a very interesting bit of architecture, peculiar from the varied size and proportion of the openings. Above this peers the upper portion of the Victoria Tower, as we have many times watched it from the west walk of the cloister, putting on different aspects according to the state of the atmosphere; sometimes glittering in the sunshine, all over points of light, sometimes a mere silhouette in the misty air.

In desiring to place on record this incident in London architecture, we could not have done better than to secure the assistance of an artist who, like Mr. Herbert Marshall, has made a reputation out of his paintings of London scenery, but who has never yet painted this particular view. Mr. Marshall's drawing, made especially for this number of the *Builder*, has the merit of extreme fidelity as well as of powerful artistic effect. Taken as the sketch was in winter weather, Mr. Marshall has naturally adopted the less brilliant aspect of the tower, giving the architectural features only in the broad and suggestive way in which they are seen under the conditions of weather which have recently prevailed.

THE ROYAL ENGLISH OPERA-HOUSE, SHAFTESBURY-AVENUE.

THE above title for this theatre was only decided on and published since the printing of our illustration, which therefore only appears on the plate by the title by which it has hitherto generally been referred to as "Mr. d'Oyly Carte's New Theatre."

As the exterior design alone is by Mr. Collcutt, who is not responsible for the plan and arrangement of the building, this is given simply as a piece of architectural design. Details concerning the theatre itself will be given when it is opened.

The system of engaging an architect to design an exterior for a building which he has not planned is not a good one, but in this case at all events it has probably saved the exterior from commonplace, and enabled us to congratulate Mr. Collcutt on having produced the only piece of picturesque theatre architecture which London can boast of.

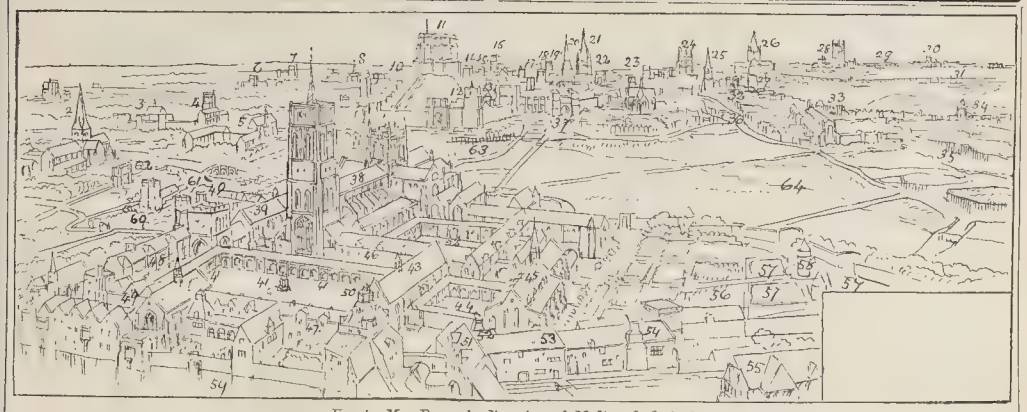
THE GREAT HALL, VICTORIA COURTS.

THIS hall forms the principal approach to the courts, and will serve as a general waiting-hall for them, all the police-courts opening direct from it by the doors shown in the view, the assize-courts being approached through the central archway, leading to an inner waiting-hall of smaller dimensions, thus securing greater quiet for them.

The dimensions of the great hall are 80 ft. by 40 ft., with 10 ft. corridors at either end, increasing the length to 100 ft.; the height from the floor to plate is 40 ft., and to ridge 72 ft.

The hall is lighted by a range of five windows on the south side and one on the north, and two large end windows of fifteen lights each. The whole of these have been filled with stained glass as the Jubilee memorial of the city of Birmingham, and have been executed by Messrs. Heaton, Butler, & Bayne, from the designs of Mr. W. H. Lonsdale, the cartoons being drawn by Mr. P. H. Newman.

The walls are faced with Messrs. Gibbs & Canning's buff terra-cotta of most excellent



Key to Mr. Brewer's Drawing of Mediæval Oxford.

1. St. Giles Church.
2. Rewley Abbey (Cistercians).
3. Beaumont Palace.
4. Carmelite Church.
5. Gloucester College (Worcester).
6. St. Bernard's College (St. John's).
7. Holy Cross Church.
8. Augustinians (Wadham).
9. St. Mary Magdalene's Church.
10. Durham College (Trinity).
11. Castle.
12. St. George's College.
13. St. George's Church.
14. St. Michael's, Northgate.
15. Our Lady's Chapel, Smithsgate.
16. New College.
17. St. Peter Le Bailey.
18. St. Martin (Carfax).
19. St. Peter-in-the-East.
20. All Saints' Church.
21. St. Mary's Church.
22. All Souls' College.
23. St. Ebb's and Franciscan Monastery.
24. Merton.
25. St. Aldate's.
26. St. Frideswide's (Christchurch).
27. St. Michael's South Gate.
28. Magdalene College.
29. Magdalene Bridge.
30. St. Clement's Church.
31. Millham Causeway and Bridge.
32. South Gate and Tower Hill.
33. Blackfriars (Dominicans).
34. Grandpont.
35. Preachers' Pool.
36. Trill Mill Stream.
37. West Gate.
38. Osney Abbey Church.
39. "Domus Dei."
40. The Great Gate.
41. The Great Cloister, "Ambitus Laicorum."
42. The South Cloister, "Ambitus Sacerdotum."
43. Refectory.
44. Infirmary Cloister.
45. Infirmary and Chapel.
46. Lay Brothers' Dormitory. (?)
47. Men's Guest House, "Diversorium Virorum." (?)
48. Women's Guest House, "Diversorium Feminarum."
49. Abbot's Palace and Guest Hall.
50. Great Kitchen.
51. The Mill.
52. The "Kyll" (Malthouse).
53. The "Canon's Building."
54. The Bake-house.
55. Tannery.
56. Gardens.
57. Fish Ponds. (?)
58. Dove-cots. (?)
59. Mill-stream.
60. St. Thomas (St. Nicholas).
61. The Hamel.
62. Rewley Gate.
63. King's Mead.
64. South Osney Isle.



quality, and the modelling is by Mr. Aumonier, assisted by Mr. Townroe. The roof is of hammer-beam construction in deal and pitch-pine, left plain from the tool.

The general contractor is Mr. John Bowen, of Birmingham, Mr. Richards acting as clerk of the works. The architects are Mr. Aston Webb and Mr. E. Ingress Bell.

JUNIOR CONSTITUTIONAL CLUB.

OUR illustration of this building, now in course of erection in Piccadilly, is taken from the original first sketch. The design, as worked out, will slightly differ in general treatment.

The new Club-house will be faced with white Norwegian marble, from Mr. Anker's quarries at Ofoten Fjord, with Portland stone for general moulded work. The three-quarter columns on the ground floor will be in Shap granite, and the entrance and shafts to first and second floor windows in red Ross of Mull granite. Fireproof floors will be used throughout. The general contractors are Messrs. Bywater & Co. Messrs. Burke & Co. are doing the stone and marble work, and Messrs. Homan & Rodgers the iron-work and fireproof floors.

The new building will be fitted with all modern conveniences; elevators to every floor. The rooms are large and lofty. Marble will be freely used in the decoration of outer and inner halls and grand staircase. Some sixty bedrooms will be provided for the use of members, who now number over 4,000. The cost of the building alone will be about 75,000*l.*, and it is hoped that it will be completed for opening by July, 1892. The club is at present occupying temporary premises at 14, Regent-street.

The architect is Mr. R. W. Edis. The building will be one of the first examples of marble being used to any large extent in ashlar facing for a London building. The necessity of providing three floors of bedrooms for members compelled the smaller treatment of the windows on these floors. One feature of the club will be a large smoking-room on the ground floor; an accommodation which in a club is generally relegated to the upper floors.

We give a plan of the first floor, with indications as to the functions of the corresponding rooms on the ground floor.

The architecture, as is not unfitting, shows a considerable family resemblance to that of the Constitutional Club in Northumberland-avenue by the same architect.

MEDIÆVAL OXFORD.

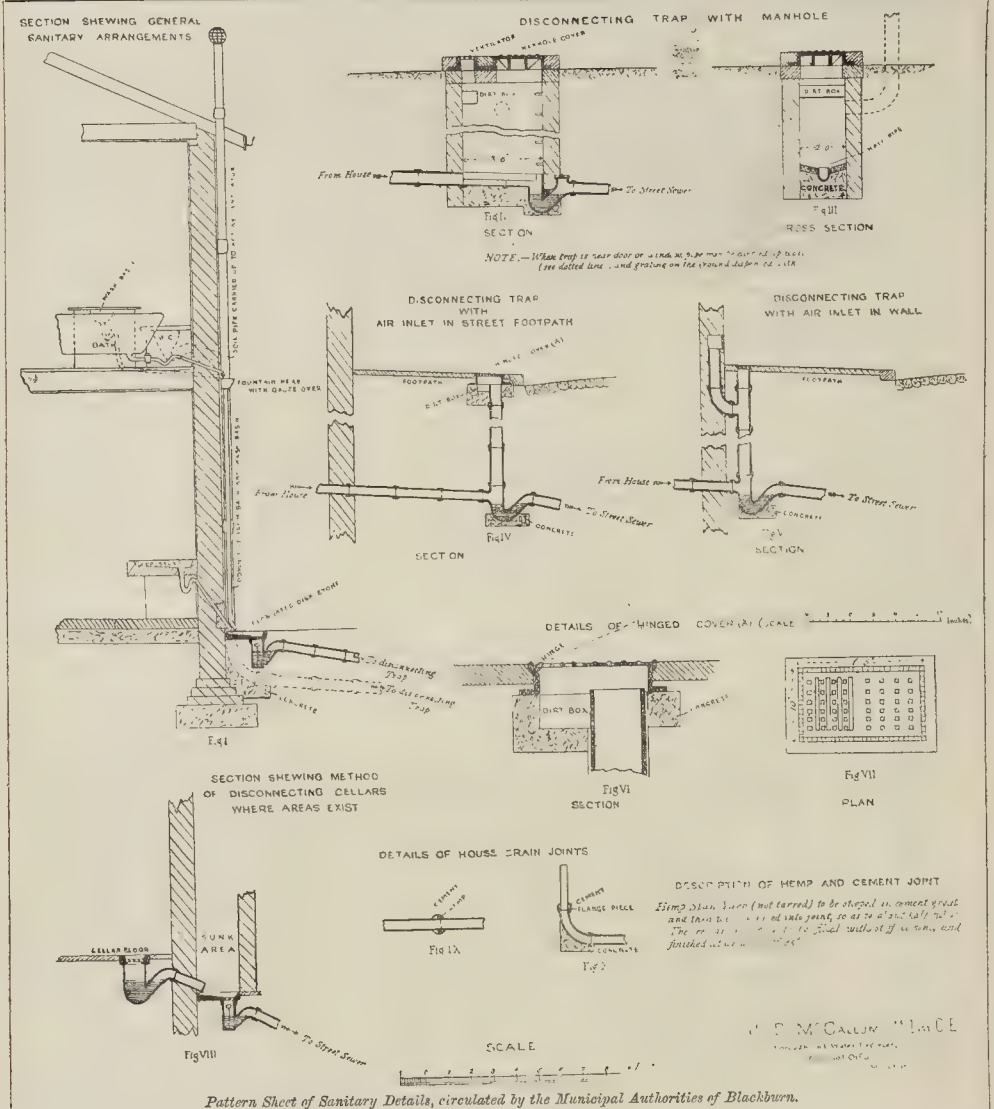
FOR a description of the buildings shown on Mr. Brewer's large drawing see key given above, and the long article commencing on p. 2.

COMPETITIONS.

TOXTETH-PARK NEW HOSPITAL.—At a meeting of the Toxteth Board of Guardians on the 24th ult., it was resolved by nine votes to three (the Chairman being amongst the three dissenting) to appoint Messrs. C. O. Ellison & Son, Liverpool, as architects for the new buildings.

SCHOOLS, COTTINGHAM.—The School Board of Cottingham, East Yorkshire, recently invited designs for an elementary school for 750 children. The design submitted by Messrs. Botterill, Son, & Bilson, of Hull, has been selected, and will be carried out. The second premium was awarded to Mr. E. W. Farebrother, of Grimsby.

PONTYPOOL ARCADE, &C.—The Hanbury Assembly Rooms Company, Limited, having obtained designs for an arcade and assembly-rooms to be erected on sites between Georges-street and Osborne-road, Pontypool, at a general meeting of the subscribers held at the Local Board offices on December 31, the plans submitted by Mr. E. A. Lansdowne, architect, of Newport, were, we are informed, unanimously selected, and tenders for the erection of the buildings will be forthwith obtained.



Pattern Sheet of Sanitary Details, circulated by the Municipal Authorities of Blackburn.

SHEET OF SANITARY DETAILS, BLACKBURN.

THE accompanying sheet of sections and descriptions of various points in the drainage details of a city is from a tracing of a coloured sheet, issued under the direction of Mr. J. B. M'Callum, the Borough Engineer of Blackburn, as a guide to builders and others in regard to the manner in which such work is expected to be done. We publish a reduced copy of it, to call attention to a very practical method of spreading instruction on such points.

SOME ERRONEOUS APPLIANCES FOR WARMING HOUSES.

ALTHOUGH it is readily admitted that "where there is smoke there is fire," yet the converse of the proposition, that "where there is fire there is smoke," is not so usually allowed. That this is true, may be seen from the appliances which at this season are recommended for warming houses, and which are actually sold for this purpose. It seems to be held that because the smoke, or rather the products of combustion, of a gas or paraffin-oil stove are not visible, therefore, there is no smoke at all; and that there can be no harm in having one of these burning for hours together in the hall or staircase of a house. The want of any means of warming this part no doubt greatly diminishes the comfort of the house by leaving a large body of cold air in its centre ready to enter any of the rooms the moment a door is opened. Nevertheless, this great evil should not be remedied by the use of one of these portable gas or oil stoves, unless they can be connected with a pipe or flue to take away to the outside air all the products of combustion. If this escape is not provided it leads to the accumulation of carbonic acid and other gases in the atmosphere of the house to a very unwholesome extent.

To understand this more fully we may put before our readers a few facts about two of these heating appliances which we have lately seen on sale. One of these is a gas-stove, and the other is a frame of hot-water pipes heated by a small paraffin-oil stove. The former of these is neatly constructed, and is apparently intended to convey the idea that nothing is given out by it which can foul the air of the place where it is burnt, and this was the view maintained by the salesman who was recommending the appliance to a purchaser. This stove is nothing but a large argand burner, surmounted with a short double chimney, the top of which has openings in it to allow the heated air to escape. It looks a simple, neat arrangement, and when burning appears fairly efficacious. These appearances, however, are altogether deceptive. This stove consumes, we were told, 8 cubic feet of gas in an hour; and this amount of gas, when consumed, yields 5½ cubic feet of carbonic acid gas. Suppose that this stove is in use for ten hours, no less than 55 cubic feet of carbonic acid would be thrown into the atmosphere of the hall and staircase of the house where the stove was in use. Such an amount of this deleterious gas would far exceed the limits of safety. The researches of Messrs. Carnelly, Haldane, and Anderson have made it clear that the carbonic acid in the air of an inhabited room should not exceed ten parts volume in 10,000 volumes, and even in the lofty rooms of a public school, inhabited for only a portion of the day, the air ought never to contain more than 13 volumes of carbonic acid *per* 10,000 volumes of air In the more open parts

of London the normal air does not contain less than 3 or 4 volumes of carbonic acid *per* 10,000. Let us assume that this was the composition of the air in a fairly-well ventilated house; and that 2,000 cubic feet was the amount of air in its hall, staircases, and landings. This figure gives approximately the cubic capacity of the hall, &c., of a medium-sized dwelling house.

Now, if we bring into use a gas-stove like that described above, it will add 5½ cubic feet of carbonic acid per hour to the 2,000 cubic feet of air; so that at the end of one hour the proportion of the carbonic acid would be 27½ for every 10,000,—an amount which is more than double the extremest limit allowable; and this large proportion would be increased every hour the stove was kept burning.

It may be urged that ventilation would prevent this great accumulation of the foul gas. No doubt it would, but it would also allow cold air to enter, and that which had been warmed to escape, thus neutralising the very purpose for which the stove is used.

In the case of the other warming apparatus in which the paraffin-oil stove heats a frame of hot-water pipes, it is hard to see what the use of the latter is, for they only help the warming of the air by distributing the heat a little; they do not lessen the amount of carbonic acid given out by the oil stove. The amount of paraffin-oil reported to be consumed in one form of stove offered for sale was nearly ½ gallon in a day of ten hours. By calculation, it appears that this consumption would result in the production of 6·88 cubic feet of carbonic acid per hour, giving nearly 69 cubic feet for the day: a much larger quantity than in the case of the gas-stove.

It should not be forgotten that not only do such stoves foul the air by adding a dangerous gas to it, but they also withdraw the oxygen from the air and make it less fitted for the purpose of respiration.

There are many appliances for warming houses which are quite harmless, and which are more or less efficient. It is not our present purpose to speak of them, but only to call attention to the forms mentioned, which, in the way they are offered for sale, are really dangerous. It is but right, however, to say that the simple addition of a chimney or flue, by which the products of combustion of either the oil or the gas could be carried into the open air, would render them both suitable and safe.

THE ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.

THE following is the Report of the Council of this Institute for the past year, adopted at the annual general meeting on the 13th ult., as mentioned by us last week:—

"As you are no doubt aware, at this our annual meeting we close our session, wind up accounts, and give a brief report of our doings during our term of office now closing. We venture to hope that the work we have accomplished during that period may meet with your approbation. If it be objected that but little has been accomplished by your Council, we can only say what we have often said before, namely, that we are at all times both anxious and willing to take cognisance of any matter affecting the welfare of the profession that may be brought before us, while we regard the fact of no business of a startling nature having been done as in itself a subject for congratulation, showing as it does that the course of our practice is running smoothly, and that the members of the profession have had no special need of our services.

As you may have observed from the voting-papers, we held twelve Council meetings during the past session—nine ordinary, and three special. The By-laws provide for calling a special general meeting at any time during the session on a requisition in writing from three members. No such requisition having been received, we are entitled to conclude that no such meeting was considered necessary. The Council, however, wish it to be distinctly understood that, no matter how comparatively unimportant the occasion may be, it would be to our mutual advantage to meet and discuss any question at issue if it affects the interests of the profession in the slightest degree.

In accordance with the resolution passed at our last annual meeting, a deputation of the Institute presented an address of welcome to the present Viceroy on his accession to office, and at the same time requested him to become our Vice-Patron, as his predecessors had been. He was graciously pleased to accede to our request, and also referred in eulogistic terms to the architectural features of Dublin and our ancient monuments.

Probably the most important matter which your Council have had to consider during the past session was the new Corporation Bill, especially with regard to its bearings on future building operations in Dublin. While viewing the Bill on the whole with favour, your Council considered that clauses 36 and 40 required revision; and, having had legal advice on the matter, they drew up certain amendments, copies of which were forwarded to the members of the Corporation more particularly connected with the building trades. They also commissioned your President to attend the committee meetings at the Mansion House, and explain our views on the clauses in question. The Bill has since become law, so that we can now see for ourselves the results of our action. We cannot too often seek to impress upon you the necessity of united action in these matters, so that our Institute may speak with due weight and authority.

The next matter of interest that came before us was the revival of the Architects and Engineers Bill. After giving it due consideration, and having ascertained the views of the British Institute on the subject, we determined to oppose the Bill in Parliament, on the ground that the system of examinations now being established by the last-named body will in due time place the profession on a sound basis and prepare the way for a better-matured measure of legislation than this crude and inopportune Bill can be considered to be. At the same time, we fully recognise the necessity of some radical alteration on the present system in the near future. We have some knowledge of the almost ludicrous abuse of the term 'architect' in some of our country towns. Incidents are not wanting in the working of recent Acts of Parliament where even small farmers have posed before their native unions under the style of 'architect.'

We have had further the satisfaction for the first occasion in taking united action in our opposition to this Bill with the British Institute, and the provincial societies as an affiliated body with them. Our petition was kindly presented to the House of Commons by Mr. William Johnston, M.P.

In the month of June your Council endeavoured to organise an excursion to the Rock of Cashel and other places of architectural interest in that district. Circulars giving particulars were sent out, but we regret to say that the responses to them were not sufficient to warrant us in undertaking the excursion, which had therefore to be abandoned.

We have had before us a form of contract and general conditions submitted for the approval of the Institute by the National Association of Master Builders of Great Britain. Your Council feel that this important subject is worthy of their most careful consideration, and they have opened communications with both the last-named body and the British Institute, and are at present awaiting their replies. When we shall have formulated our views, we shall take an early opportunity of explaining them to you, so that as far as possible we may adopt similar forms in our specifications and contracts.

The notice of a preliminary and intermediate examination was advertised to be held here in November last, in the same manner as in 1889. Only one candidate, Mr. Crean, offered himself, and we are glad to inform you he was allowed his examination.

Some time back Mr. A. Hill, of Cork, invited our co-operation towards the establishment of a training college for architects, with a university degree. We consider this to be a matter more properly to be ventilated and discussed by a general meeting, and we therefore bring it under your notice now. Mr. Hill's first letter has been mislaid, but we have another from him dated September 5.

Now, gentlemen, it is for you to say if you wish us to take any action in this direction or not. You may be assured that in these days of rapid progress and keen competition, it behoves us to lose no opportunity of securing for our younger members all possible educational advantages, so that the profession in Ireland may keep pace with the times, and worthily fulfil its high mission as an important factor of our civilisation."

The following is the Treasurer's Report:—

"Your Hon. Treasurer begs to state that all dividends and subscriptions have been received, with exception of those of twelve members. All accounts have been squared up and audited, as shown by the books now before you, leaving a balance to credit of 42*l.* 16s. 11d., which includes 10s. 6d. paid since. Your investments in the 2½ per cent. annuities now stand at 334*l.* 14s. 7d., in the names of the trustees. The total number of members at present is sixty-four (including defaulters), of whom thirty-eight reside in Dublin, and twenty-six in the provinces. Of the total number thirty-five are Fellows, and four are life members."

THE PROPOSED INTERNATIONAL EXHIBITION AT CHICAGO IN 1893.

AT the meeting of the Society of Arts, on the 3rd ult., Mr. James Dredge read a paper on this subject. He said that the suggestion that a great International Exhibition should be held in the United States two years hence appears to date from the summer of 1889, when the rumour spread that Americans, incited by the brilliant results achieved in Paris, determined that a similar celebration, but one that should surpass in extent and grandeur the Centennial Exhibition of the French Republic, should be held on the other side of the Atlantic.

What was only a vague rumour floating over the Champs de Mars in 1889 speedily took serious shape, and there can be no doubt that such a scheme is an eminently practical and useful one. Sixteen or seventeen years will have passed since the great Centennial Exhibition had been held in America; and this long period has been marked by a development of resources, a growth of population, an increase in industry and in riches to which history can offer no parallel. In the United States, the Philadelphia Exhibition of 1876 already belongs to ancient history, but it is regarded as an epoch from which is dated the commencement of much that was new and good in American taste and culture, notably, as regards house architecture and art publications. The great flood of annual travel from America to Europe had not then set in, and to most of the visitors to Fairmount-park, where the Exhibition was held, the contributions from foreign nations were a revelation. Since that time, of course, increased wealth and facilities for travelling have brought an ever-growing crowd of visitors to Europe; and the lessons first taught at Philadelphia have been extended year by year, until the adaptive character of the American has assimilated, more and more, European habits and refinements, and the gulf that separated our manners and customs from theirs is growing narrower day by day.

In the United States, decisive action usually follows with great promptness ideas which are favourably received; in October of 1889 it was determined definitely, and almost unanimously, that the Columbian Exhibition should be held, and with this determination came the burning question: To what city should be awarded the honour and the responsibility? The claims of New York, of course, stood paramount, partly because to New York was due the credit of the original proposition, but chiefly for the reason that New York is the metropolis of the United States, the most cosmopolitan city in the world, and the one best known to Englishmen. Situated on the sea, with a harbour that allows the largest ships to moor alongside her wharves, the facility her position offers to visitors, as well as to the goods sent by exhibitors, are unquestionably very great. To the city of New York, indeed, it seemed as though no other town could successfully contest her fitness or her right to the Exhibition of 1892; but American rival cities are enterprising and presumptuous, and several others advanced claims more or less reasonably and stoutly maintained. Washington and Philadelphia, St. Louis, Cincinnati, and Chicago, all entered the lists. Only one serious opponent remained, however, to New York after the first encounter; Philadelphia, who had snatched the honours of the Centennial Exhibition of 1876, could not expect a repetition of the same good fortune, which would have stamped her as the exhibition city of the United States; Washington, beautiful and attractive as she is, is wholly given up to political instead of commercial enterprise, and made no serious effort to gain a privilege that

was thrust upon her rather than sought; St. Louis was too remote, and Cincinnati not large enough for such a responsibility, so in a very short time it became evident that the selection lay between Chicago, a thousand miles inland, and New York. Before matters had been settled thus far, the approval of the Senate and the President had constituted the Columbian Exhibition as an enterprise endorsed and assisted by Government, so that from the beginning its official character was clearly defined. As much to the surprise as to the indignation of New York, the city of Chicago maintained its claim.

With characteristic enterprise, its citizens had, before the fray commenced, organised a corporation with a large capital. Not that it was intended to degrade the scheme by making it a commercial speculation, but because it was recognised from the commencement that the greater part of the capital necessary for carrying out this enterprise successfully must be raised in the city. Immediately after this had been done, delegates were sent to Paris to confer with M. Berger, and other directors of the French Exhibition then closed, to obtain all such information as would be useful in carrying on the conflict about to commence, and to organise the Exhibition afterwards.

One of the delegates was Mr. E. T. Jeffrey, and the other Mr. O. Chanute, a well-known American engineer. The report prepared by these gentlemen, during their visit to Europe, was very long and exhaustive, and it proved of considerable service in the struggle that afterwards took place at Washington. Of this struggle it need only be said that it was protracted and severe; New York and Chicago were practically the only claimants in the field, and much oratory and cunning argument were put forth on both sides. Probably New York committed the dangerous error of underrating its opponent; and certainly it had the fatal misfortune of suffering from political internal feuds which of itself was sufficient reason for its losing the contest. In the end, Chicago came out signally victorious; and, on April 25 of the past year, an Act of Congress was approved, providing for the celebration of the "Four Hundredth Anniversary of the Discovery of America by Christopher Columbus, by holding an International Exhibition of Arts, Industries, Manufactures, and the products of the soil, mine, and sea, in the city of Chicago." This legislation, while it constituted the Columbian Exhibition a Government undertaking, pledged the United States Treasury to but little expenditure, although there is but slight reason to doubt that, should the necessity arise, patriotic feeling at Washington, combined with the senatorial pressure from the Western States, would assure a liberal amount of Government aid.

To such an extent is the Exhibition regarded as a Government undertaking, that the Act of Congress above referred to provides that the general control shall be vested in a United States Commission, composed of two Commissioners from each State and territory, and of eight special members; this body is recognised as the Columbian World's Fair Commission. As a matter of fact, this Commission was appointed in duplicate, so that a reserve force should always be on hand to fill up vacancies. The chief functions of this Commission were to decide upon the site available for the Exhibition; to approve of the buildings and general arrangements; to make allotments of space, to classify exhibits; to determine the plan and scope of the undertaking; to appoint the juries and confirm awards; and to make all arrangements with foreign exhibitors. The actual carrying out of details, and, in fact, the responsibility of the undertaking, falls, however, upon the Executive Committee, which has been formed from the original organization of Chicago citizens, the Washington Commission being instructed to withhold their assent to any actual steps being taken until the corporation could show that it possessed a *bonâ-fide* subscription of at least 5,000,000 dols., of which 10 per cent. was paid up, and a further guarantee of 5,000,000 dols. making in all 10,000,000 dols., to provide for the expenses of construction and management. So soon as formal notification to this effect has been given by the Commission to the President of the United States, he will make proclamation of the fact, and will communicate with the diplomatic representatives of foreign nations, and through them invite their respective Governments to take part officially in the Exhibition. As regards the active participation of the Government as an exhibitor, it is provided that a sum of 500,000 dols. should be devoted to the erection of a Government building, to be filled with Government exhibits, which would be collectively contributed from various executive departments; such as the Smithsonian Institution, the United States Fish Commission, and the National Museum; the control of this collection being vested in a special committee. Another Government exhibit will be the complete reproduction of a first-class life-saving station, of which there are many on the American coast. The President is also empowered under the Act to hold a grand naval review in New York Harbour in April, 1893, and in which the navies of foreign nations will be invited to participate. Besides the foregoing, the American Government makes itself responsible for various other sums, the total authorised outlay being 1,500,000 dols.

The Corporation, acting under the general control of the United States Commission, consists of a board of forty-five directors, all of them carefully selected with reference to their influence and standing; of these the president is Mr. Lyman J. Gage, one of the leading bankers in Chicago, and the secretary is Mr. Benjamin Butterworth, who is well and favourably known in political circles at Washington. The director-general, elected only a few weeks since, is Mr. George R. Davis. Out of the body of directors a number of committees were formed: the Executive Committee with thirteen members, and others dealing with finance, grounds and buildings, legislation, national and State exhibits, foreign exhibits, catalogues and printing, transportation, fine arts, mechanical and electrical appliances, and ways and means.

The President of the United States has not yet issued the invitations of participation to foreign countries, because the financial conditions prescribed by the Act of Congress have only been very recently complied with, but it is expected that they will be delivered within a few weeks. . . . .

A struggle scarcely less severe than that at Washington followed the victory scored by Chicago, and took place within the city itself. This was the battle of the sites, in which all citizens, and many who were not interested at all, took part with that energy and vehemence so surprising to an Englishman. Railway Companies and Park Commissioners, the Government Committee, and the local executive, even the United States Engineer Corps, took active sides in the dispute, while the Chicago newspapers, with but little patriotism and less reason, added to the confusion by indiscriminate condemnation. Of course, order was evolved out of all this chaos, but not until much valuable time was lost, and more or less mischief done. One of the most lively causes of dispute was the so-called dual site that involved the arrangement of the Exhibition in two localities about three miles apart. Without explanation, this proposal appeared an unpractical one, though in reality it was attended with many advantages, and was in the end very willingly adopted. . . . .

The system of classification has not, of course, been decided on, though it has received very careful attention by the executive. Generally, it is intended that a decimal system of arrangement should be adopted, in which the groups should be divided into ten divisions, and each division into ten classes. It is proposed that the arrangement of groups should be as follows:—(1) Agriculture and allied industries; (2) mines and metallurgy; (3) marine and fishery; (4) manufactures and other elaborative industries. This group would include machinery of all classes, the applications of electricity, industrial chemistry, pottery, glass, metal-working, furs and leather, textile industries, paper manufacture, &c. Group 5 would be devoted to food and its accessories, including the production from raw materials, preparation, and preservation. Group 6, "The house and its accessories, costume, and personal equipment," embraces the arrangement, heating, lighting, ventilation, and water supply of cities; architecture, furniture, dress, jewellery, &c. Group 6 is devoted to the pictorial, plastic, and decorative arts; and Group 8 to social relations and public welfare. The last-named group includes music and musical instruments, medicine and surgery, hospitals and charitable institutions; exhibits relating to property and commerce, labour federations, and the art of war. Group 9 is that of science, religion, and human achievement. In this group would be included scientific instruments of all classes, publications, all sorts of ecclesiastical exhibits, and that special branch of educational work of which we know but little in this country, but which is such an important addition to all American churches. Group 10 is devoted to monographic and collective exhibits, a group which the executive appear desirous of encouraging, and of granting to special industries the privilege of taking their exhibits from the groups to which they properly belong, and arranging them separately in different parts of the main buildings or in independent pavilions. . . . .

As regards the Art Section of the Exhibition, two distinct questions would arise; the first having reference to an art collection worthy of this country, and consisting chiefly of pictures lent for the occasion. Such a course was followed at the Philadelphia Exhibition of 1876 with very satisfactory results; it is obvious that this class of collective exhibit has no reference whatever to commerce, and can only be carried out at a very heavy cost, which may be justified by the desirability of maintaining the credit of British art abroad. The other class of art exhibits has a more commercial object; there are many painters of excellence in this country who find it difficult to obtain and keep so large a number of clients as they desire, and these would undoubtedly find new purchasers in America, in spite of the heavy tariffs imposed on paintings. Such an exhibit certainly may not be a representative one, but it would doubtless have the advantage of bringing to many struggling artists in this country a rich and liberal *clientèle*.

Whatever objections there might be to the creation of a British section in the Chicago Exhibition, there cannot possibly be two opinions about the advantages which would accrue to visitors from this country. Comparatively few Englishmen have any idea of the wealth and resources of the United States; of the progress and culture of its people in remote regions; of the part which America is destined to take in the near future in the civilisation and commerce of the world.

PERIODICALS.

THE January number of the *Antiquary* is an unusually interesting one. It includes a review of Greek archæology in 1890, by Professor Halbherr; an illustrated article on "The Lake Dwellings of Europe"; one by Mr. St. John Hope on the "Mace of the House of Commons," with an engraving; and the first of a proposed series of articles, to be continued at intervals, entitled "Notes on Roman Britain," by Mr. F. Haverfield.——The January number of the *Art Journal* gives an etching by Mr. T. C. Farrer from Mr. Boughton's painting "Winter in Brabant," and includes an article by Mr. Sidney Colvin on "The Longford Pictures at the National Gallery," and one by Mr. Anderson Graham on the scenes of "Lord Tennyson's Childhood," with illustrations.——The *English Illustrated Magazine* contains an illustrated article by Mr. Cobden-Sanderson on "Bookbinding," to which further reference is made in another column.——*The Bookworm* is interesting to architects and archæologists for an old illustration of "The Swan Theatre in 1596," reproduced from a sketch by Johannes de Witt, who visited England in that year. The sketch was discovered in the University Library at Utrecht. It represents, in a rude way, a wooden theatre with tiers of seats round, the centre open to the sky, and a platform or huge table in the middle on which the performers acted. What appears to be the most select portion of the auditorium has a roof projecting partly over the platform, and supported by two pillars planted on it, reminding one of the two pillars of the Philistine Theatre by the removal of which Samson pulled down the roof on the nobles—

"The vulgar only 'scaped who stood without,"

as Milton puts it.——*The Field Club*, a small magazine of natural history jottings, good of its kind, has been sent to us; there is nothing in it, however, directly bearing on our class of subjects.——*Cassell's Magazine* for January (Cassell & Co., Ltd.) contains an interesting article on "The Coming Census,' and how it will be taken. Among the other contents of

the number may be mentioned an illustrated article entitled "Memories of Milan."——*The Leisure Hour* for January (London: 56, Paternoster-row) contains a chapter of the Rev. Canon Creighton's interesting "Story of the English Shires," Huntingdon being the county treated of in this number. Among other articles worth reading are "Every-day Life on the Railroad," by W. J. Gordon, and "Yankee Dodges" for saving time and labour in business, by W. E. Buck.——*The Sunday at Home* (published at the same office) includes amongst its varied contents an illustrated article on Canterbury, by W. J. Gordon, the fourth of Professor Sayce's articles on "Social Life among the Assyrians and Babylonians;" and an article by Ellen E. Guthrie on "Inscriptions on Old Edinburgh Houses."——The *Boy's Own Paper* and the *Girl's Own Paper* (also issued from 56, Paternoster-row) are among the best publications of their kind. Among the contents of the last-named is an article on "Christian Art in the Fifth Century," and an outline of a drawing by Kate Greenaway, to be painted in competition for prizes.

ALMANACKS AND DIARIES FOR 1891.

WE have received Sprague's Architects' and Surveyors' Pocket Diary (London: Sprague & Co.) in two forms, a small pocket-book with the diary and tables inserted in it, and a larger one with Diary and Tables placed in two of the pockets, as separate pamphlets. We have before mentioned the tables of elementary statistics as very useful for reference.——"The British Almanac and Companion" (London: Published by the Stationers' Company) will be found, as usual, full of varied information. A very useful feature is its list of Acts of Parliament passed last session, abstracts being given of the more important ones. The article on "Architecture in 1889-90" is by Mr. R. Langton Cole, and it gives a summary of the principal events of the year in the architectural and building world, with, on the whole, judicious comments. The article on "The Art of the Year" is by Mr. Cosmo Monkhouse, and that on "Science of the Year 1889-90" by Mr. E. W. Maunder. Mr. W. T. Lynn, F.R.A.S., contributes an interesting article on "Observatories."——"Calvert's Mechanics' Almanack" (London and Manchester: John Heywood) is now in its eighteenth year of publication, and its contents are as varied as ever, rendering it a useful workshop companion.——"The City Diary and Almanack" (London: W. H. & L. Collingridge, *City Press* Office) will be found to contain, as usual, a very great deal of useful information, particularly with regard to the Corporation of London and City affairs generally.——The "Law Almanack" (London: T. Scott & Co., 1, Warwick-court, Holborn) is a very useful sheet almanack, mounted on stiff pasteboard.——The "Railway Diary and Officials' Directory" (London: McCorquodale & Co., Limited) contains information of a special character, not found elsewhere, relating to the administration of our railways. The "Railway Almanack" is a useful sheet issued from the same office.——The "Gas Engineer's Pocket Almanack and Lighting Table" (London: W. Sugg & Co.) contains, as hitherto, a great deal of special information.——"Blackwood's Shilling Scribbling Diary" (London: Griffith, Farran, & Co.) is sent to us as a specimen of the rest.——"The Architect's Diary," "The Builder's Diary," &c., &c. (London: Hudson & Kearns, 83, Southwark-street): Just as we go to press, and too late for detailed notice, we have received from the publishers a parcel of their well-known and much-appreciated diaries for the use of architects, builders, and others. The excellent and special features of these diaries have so often been spoken of with commendation in our columns that, even if we had time and space at our disposal now, it would not be necessary to say more than that these publications seem to fully maintain their good reputation. The same publishers also send us a selection of their excellent date-indicating blotting-pads and diaries.

TRADE CATALOGUES, &c.

MESSRS. COTTERELL BROS., Bristol, send us their new Pattern-book for 1891, a very bulky collection, including a large number of serviceable papers and wall coverings, many of them washable.——Messrs. Measures Brothers send us a very convenient pocket section book of iron and steel joists, girders, &c., with the safe distributed loads for various spans. It gives a great deal of very useful information in a very small space.——Among other catalogues received are those of the Archer Pipe Company (whose well-known pipe-joint for sewers was described in our paper two or three years ago); Messrs. G. Bailey Toms & Co., of Lawrence Pountney-hill (who send us a useful illustrated list containing a large number of sections of iron and steel joists, &c.); Messrs. D. Hulett & Co. (a catalogue of wrought-iron gas-brackets, chandeliers, &c.); and the Bennett's Ironfoundry Co. (catalogue of tomb railings, &c.).

Correspondence.

To the Editor of THE BUILDER.

HANOVER CHAPEL.

SIR,—Surely some protest will be made against the destruction of Hanover Chapel, Regent-street. Have we no respect for the memory and the works of our greatest English architects, and are buildings which are landmarks in the history of Art to be removed at the will and pleasure of any one who happens to be their possessor for the time being?

The portico of Hanover Chapel is, without doubt, one of the finest architectural objects in the West-end of London, and is the work of the greatest Classical architect of the nineteenth century—one whose mighty genius had, alas! few opportunities of displaying itself. Those, however, who knew the late Professor Cockerell, and who have seen his wonderful "restorations" of buildings in Rome, Athens, &c., can well appreciate his greatness, and I feel sure that if the most ordinary observer will just take the trouble to look at the Hanover Chapel portico from the opposite side of the road, he will be easily able to realise the loss which our street architecture will sustain in its removal. H. W. BREWER.

December 29, 1890.

WESTMINSTER ABBEY COMMISSION.

SIR,—In your notice of the voluminous evidence contained in the "First Report" of the Westminster Abbey Commission, it is not surprising that a slight misapprehension of my proposal should have crept in, namely, that I proposed a wreath of chapels to be entered from the Chapter House. Curiously enough, this misapprehension is shared by the Archbishop of Canterbury, whose evidence you may have read without referring to mine. In reply to question No. 715, "Do you propose an entry from the chapel into the Chapter House?" you will find my answer, "No."

His Grace, in reply to question No. 1,147, said that the proposed sacred chapel should be as closely connected with the Abbey as possible, and I venture to submit that, with the exception of the Abbey Green on the north side of the Abbey, the vacant space around the Chapter House is nearer to the interior of the church than any site yet proposed.

If the great expense were to be incurred of purchasing and removing the houses facing Old Palace-yard and Abingdon-street, the revealed Chapter-house girt with a wreath of chapels may be made an effective group. That it would be architecturally correct is proved by the existing chapels built betweeen the flying buttresses of the Abbey itself.

If the houses be not purchased and pulled down, the proposed chapels could be built one at a time, as occasion may require, without producing any appearance of incompleteness as seen from Old Palace-yard.

Proximity and economy may, therefore, be urged in favour of the scheme which, in compliance with due request, I ventured to lay before the Royal Commission. EDWARD J. TARVER, F.S.A.

*** See "Note" and illustration on page 7.

THE ARCHITECTURAL ASSOCIATION SUBSCRIPTION.

SIR,—In your report last week of the meeting of the Architectural Association, and which report was necessarily abbreviated, my remarks upon the raising of the subscription to present members are, as reported, likely to convey a wrong impression, and lay me open to the charge of inconsistency; so perhaps you will be good enough to afford me space in your paper for an explanation.

In June, 1885, during the presidency of the late Mr. C. R. Pink, a meeting of the Architectural Association was held for the revision of some of the rules, and I then moved a resolution to the effect that the subscription of all members should be raised to one guinea. The proposal at the time attracted much attention, and after considerable discussion was negatived by a majority of 9: 70 voting against it, and 61 for it. Amongst the minority were, I venture to think, the most active members and reformers of that time; though there were many in the majority who equally had the welfare of the Society at heart.

I felt, however, after such an expression of opinion, that it would be a great mistake to attempt to repeat the motion, and I have more than once since publicly expressed this view.

When the Committee last session presented their excellent report and proposals for revising the scheme of education in the Architectural Association, they advised that the subscription of *town* members only should be raised to a guinea, country members remaining at the old figure, viz., half-a-guinea. This was carried, but by a small majority, and was, I have a reason to know, received with dislike by many old members, who strongly objected to pay more than they did at present. They were willing to remain on the list, but they did not see the force of being asked to contribute more to advantages they did not reap the benefit of; and I am persuaded that if the new rule giving effect to this resolution had been passed, it would have resulted in a considerable secession from our ranks.

The sub-committee appointed to revise the whole of the Rules very carefully considered this question of the subscription, and in their report unanimously advised the adoption of a rule raising the entrance fee from a guinea to two guineas, and the subscription for all *new* members (after a certain date) from half a guinea to a guinea. The adoption of this rule I did my utmost to impress upon the meeting you reported in your last issue, and it was adopted, after an animated discussion, by a large majority. I believe that now we shall retain the old members, who, though they have ceased to take an active part in the work of the Architectural Association, yet take a keen interest in their *alma mater;* and that those in future joining the Architectural Association, and participating in all the advantages which it is proposed to add to the society, should in all justice and fairness be called upon to pay an increased entrance-fee and subscription. If the Architectural Association is to maintain its usefulness and efficiency, and at the same time to extend its educational advantages so as to keep abreast of the times, funds must be found, and I believe that the solution of the difficulty which we have arrived at is the best one. COLE A. ADAMS.

ECHO.

SIR,—Could any of your readers give the benefit of their advice as to how to get rid of an echo in a single-room addition to a public institution recently built?

The room measures 17 ft. by 17 ft. and 15 ft. high. Walls built of stone and lime, and battened, lathed, and plastered in the usual manner. Floor is laid with Arbroath stone paving. There are no windows, light being supplied from a roof-light, and a stove is used for heating purposes. The ceiling on one side is coved, the coving commencing about 11 ft. from the floor.

The room is only occasionally required, and little or no furniture necessary.

The echo is so strong as to render the place nearly uninhabitable. BON ACCORD.

Dec. 22, 1890.

*** A stone floor, bare walls, and little furniture, furnish just the elements for an echo. Hard, flat surfaces, not broken up in any way, are sure to produce echo. It is difficult to know what could be done with such a room without disproportionate expense; but probably a carpet on the floor would considerably reduce the echo. Curtains on the walls would do still more, but as they could probably be of no other use, it would not be worth while to do that.

OBITUARY.

MR. C. P. EDWARDS.—We regret to hear of the death of Mr. C. P. Edwards, architect, on the 18th ult., at Hammersmith. He died of heart disease, after ten days' illness. He was born at Bath, May 20, 1853, and was articled to Messrs. Wilson & Wilcox, of that city, and was afterwards in the employment of the late Professor Donaldson and Mr. J. T. Carr, of Bedford Park, Chiswick. He designed a new Mission Hall at Chiswick, which was only opened on the Saturday before his death, and the funeral service was conducted in that building. The interment took place in Hammersmith Cemetery.

VENTILATORS TO SOIL-PIPES.—In reference to the recent correspondence between Mr. Buchan and Mr. Simmance on this subject, we have received an important letter from Mr. Sugg, but as the diagram which accompanies it was received too late for production in this number, we hold over the letter till next week in order to publish it along with the diagram.

REMOVAL.—Messrs. H. Stopes & Co. have removed from 24, Southwark-street, to 10, Queen-street, Cheapside.

The Student's Column.

VENTILATION AND WARMING.—I.

INTRODUCTION.

ALTHOUGH it may be possible to investigate separately, to a certain extent, the theory of ventilation apart from that of warming; in the practical application of theory the scientific principles upon which the satisfactory installation of any scheme of ventilation depends cannot be dissociated from those which govern the practice of warming, and it will, therefore, be necessary in this series of articles to take into consideration the laws which govern the application of heat to the purpose of warming the various parts of a building.

Directly we propose to introduce any scheme of ventilation into a building, large or small, it becomes imperatively necessary that we should know the method by which that building is, or will be, warmed. Conversely, before any satisfactory determination of the probable efficiency of any particular means of warming can be arrived at, the manner and extent of the ventilation of the building must be known.

Inattention to the correlation of ventilation and warming has been the cause that has led to the failure of very many attempts at ventilation in this country, and has likewise contributed to the inefficiency of many a heating apparatus, with all the disappointment resulting therefrom.

Speaking in general terms, with any system of ventilation in use, greater heating capacity must be provided; the extent of the increase of warming power will be a subject for our consideration in subsequent chapters. For the present, it suffices to remember that any empirical rule for determining the size of a heating apparatus based solely upon the cubical contents of a building or apartment, or upon the number of persons that can be congregated therein, must be inadequate for all cases, unless consideration is also given to the influence of ventilation and other factors in the problem.

Ventilation may be defined as the substitution of fresh or pure air for that which has become foul or vitiated.

The necessity for the provision of pure air in all situations where human beings live is now becoming fully recognised. With increased knowledge of the laws of hygiene amongst the public comes the conviction that only in a pure atmosphere can the vital functions be sustained at their highest point and healthy life be maintained. Although it is possible for us to exist in a vitiated atmosphere for a considerable length of time, this can only be done at the cost of diminished vitality, rendering us less able to resist the attacks of disease to which we are constantly exposed. Much of the evil effect which is popularly supposed to result from the transition from heated places of public resort, churches, theatres, &c., to the cold night air is largely due to the enfeebled condition of health to which the occupants have been reduced by the vitiated atmosphere they have been inhaling.

The necessity for a pure atmosphere being recognised, we have now to consider what is a pure atmosphere, and in what respect it differs from a vitiated atmosphere.

Absolutely pure air may be taken as composed of oxygen, nitrogen, and water vapour, with a small percentage of carbonic acid, ozone, and salts of sodium. In normal air, however, organic matter and ammonia are almost universally found. In vitiated atmosphere we find the amount of carbonic acid and of organic matter and ammonia increased with the addition of other impurities, while the health-giving constituent, ozone, is absent.

The most important source of vitiation in connexion with the question of ventilation is the contamination by the products of respiration and transpiration, and the combustion of light-giving agents.

Of the products of respiration from the lungs and transpiration from the skin, organic matter is that which has the most prejudicial effect in the vitiation of air. It is this which imparts to badly-ventilated rooms their close, stuffy, and fetid odour, and to this organic impurity is largely due the baneful influence of vitiated air upon our vitality. Into the precise nature of this organic matter it is not necessary for us to enter; it is sufficient for our purpose that its addition to the atmosphere is a source of vitiation.

The other products of respiration and transpiration which mainly concern us are carbonic acid and water vapour. The carbonic acid is injurious to health, though probably less so than the organic matter; the added water vapour is prejudicial only by the increased rapidity of decomposition of the organic matter, and the concurrent development of disease germs to which it tends.

As, however, the amount of organic matter thrown off is in constant relation to that of carbonic acid and water vapour, and the amount of these latter present in any given atmosphere is far more easily ascertained than that of the organic matter, it is convenient to take the amount of carbonic acid in the air as the test of its purity.

This method will also enable us to connect the extent of vitiation caused by the agencies we have already considered with that resulting from the products of combustion, for, amongst these also, carbonic acid takes a prominent position.

We have then to determine, in order that we may be able to distinguish fresh air from foul, what amount of carbonic acid is present in vitiated atmosphere. In air of normal purity it has been found that the percentage of carbonic acid varies usually from 0·02 to 0·05, and that on the average 0·04 is the percentage of carbonic acid present in normally pure air. The amount of vitiation which is permissible may be taken as that which is the least amount that becomes evident to the sense of smell in its keenest activity. This has been found by experiment to co-exist with an added percentage of 0·02 of carbonic acid, and we may therefore conclude that air with this added percentage is foul, and below that, fresh.

It should be carefully noted that, in this connexion, the humidity of the atmosphere is a factor of considerable importance. This percentage of 0·02 has been arrived at by the experiments of Dr. de Chaumont in an atmosphere of 73 per cent. humidity, at a temperature of 63 deg. Fahr. The average humidity of the atmosphere in our English climate is from 70 to 80 per cent., while that of America is from 30 to 40 per cent., and of Germany 50 per cent.

The humidity of the atmosphere is of importance, because the greater the humidity the less the amount of organic impurity which can exist without recognition by the sense of smell, and therefore, in accordance with our presumption, the less the extent of vitiation permissible. We have frequently noticed that in crowded rooms, under precisely similar conditions, except that of humidity, the increase of moisture in the atmosphere has invariably been attended with an increase of the fetid odour resulting from the organic impurity, easily recognisable by the sense of smell.

We have, therefore, arrived at the conclusion that, for our ordinary hygrometric conditions, it is desirable that the vitiation of the atmosphere shall not exceed that represented by an addition of 0·02 per cent. of carbonic acid.

We shall now proceed to investigate the manner in which this addition may be caused. First, by the personal production of impurity in the atmosphere; it has been found, by experiment, that the average amount of carbonic acid evolved by an adult man per hour is 0·5 of a cubic foot during repose, 0·75 during very moderate exertion, and 1·5 during strong exertion.

The dilution of these amounts to our standard 0·02 per cent., or 0·0002 in each cubic foot, can therefore be ascertained by the following expression,—$\frac{C}{V} = R$, where C is the amount of carbonic acid produced per hour, V the admissible degree of impurity; and R the number of cubic feet of air required per hour to produce the desired dilution. Working this out, for the figures given above, we have 2,500 cubic feet per hour during repose; 3,500 cubic feet during moderate exertion, and 7,500 cubic feet during strong exertion.

The amount of vitiation produced by women and children is less than that from an adult man, and consequently the amount of fresh air required by them is also less. On an average the amount for women may be taken at two-thirds, and for a child at one-half that for an adult man.

That these figures are not excessive is shown by the experience of work in mines, where it is found that if the amount of fresh air provided is less than 6,000 cubic feet per hour for each man, a diminution of their effective working power results.

Comparing our figures thus arrived at with the existing practice in foreign countries, we find that in America 600 to 2,000 cubic feet of fresh air per hour are provided for each person, according to the purposes for which the rooms are used; in Germany 600 to 750 cubic feet for schools, 1,200 to 2,000 for meeting-rooms; in Austria 900 cubic feet for theatres and banqueting-halls, and 1,500 cubic feet for ball-rooms, &c. These diminished figures are partly accounted for by the less humidity of the atmosphere, to which we have already referred, and partly by extraneous sources other than the ventilation machinery, which, as we shall hereafter see, modify the conditions considerably.

In addition to the personal vitiation of the atmosphere, we have also to take into account the impurity occasioned by lighting and heating agents; thus every cubic foot of coal-gas consumed in lighting produces 2 cubic feet of carbonic acid, besides other impurities, to dilute which at least 2,000 cubic feet of air should be allowed.

SURVEYORSHIPS.

BRADFORD WATERWORKS ENGINEERSHIP.—The Waterworks Committee of the Bradford Corporation on the 23rd ult. unanimously decided to recommend that Mr. James Watson, Waterworks Engineer to the Dundee Corporation, should be appointed to fill the post of Waterworks Engineer to the Bradford Corporation (in succession to Mr. A. R. Binnie, now Chief Engineer to the London County Council), at a salary of 1,000*l.* per annum. There were sixty-one candidates for the appointment.

RUGBY.—At the last meeting of the Rugby Local Board, Mr. Seabroke moved the appointment of Mr. R. T. Stewart, son of the late Surveyor, as Assistant Surveyor for twelve months at a salary of 50 guineas.—Mr. Loverock opposed on the ground that they had just appointed a new Surveyor at 50*l.* a year less salary than his predecessor, and it would be inconsistent to give that sum to the ratepayers with one hand and take it away with the other.—Messrs. Oldham and Satchell were also against providing the new Surveyor with an assistant before it was known whether he wanted one or not. The latter proposed an amendment that the appointment be for three months.—The original proposition was carried by six votes to three.

GENERAL BUILDING NEWS.

THE BRISTOL BUILDING TRADE IN 1890.—A correspondent writes:—One of the features of the building trade in Bristol in 1890 is the recovery of the speculative business in Redland, Bishopston, and Bedminster. The houses are distinctly of a better class than formerly erected, and while this applies to all three districts named, it does so especially to the first two. Houses in Bristol, varying in rent from 20*l.* to 35*l.*, have been hitherto lamentably deficient in bath accommodation and in the distribution of hot water for domestic use to be found in dwellings of a similar class in many other localities. Possibly the high charges of the Bristol Water Company have had much to do with this, but certain it is that a new departure having been made, the builders have found the demand for the better class of houses a real one, and have been encouraged by the improved prices obtained. People in numerous instances have left dwellings hitherto occupied, and some of them conveniently situated and provided with modern requirements, to occupy new buildings simply on account of the comfort of a properly-fitted bath-room. Building is still going on, and unless the improvement in trade is wonderfully maintained, the impression is that the thing is being rather overdone. In Totterdown, another residential district, Sir Greville Smyth is taking powers for diverting paths so as to open a considerable area of land to the builders. Semi-detached villas, and houses of a superior kind are to be erected here. In general building there has been a good deal done, and some heavy contracts are still in hand. The extension of the lunatic asylum at Stapleton is one of them, and Bedminster Liberal Club and public hall, to accommodate nearly 2,000 persons, another. Messrs. C. Wills & Son have had a fine new factory built in Rupert-street, to meet the requirements of an extending wholesale clothing trade; the Barley-fields Board Schools, the police-station at Lower Redland, a handsome school in Cheltenham-road, built for 300 girls of the middle class by the Merchant Venturers, and to be opened in January; Lady Haberfield's Almshouses, an extensive and ornamental block of buildings at the Hotwells; the completion of the Clifton College and the erection of the tower; a new Wesleyan chapel at Bishopston, and a centre for mission work for the Highbury congregation (both expensive pieces of work), are among the items which can be called to mind. There was also a large expenditure, something

like 15,000*l.*, on extensions and improvements at the Bristol General Hospital, and a good deal of work in rebuilding business premises, particularly substantial modern inns in place of the older and often dilapidated public-houses bought by the brewery companies. Amongst the opportunities for industry in the coming year are the new factory for Messrs. Fry, the cocoa manufacturers, the foundations of which are being put in; the new medical wing of the University College, in place of a barn-like structure now used; and the building and completion of churches under the local extension scheme. The formation of a code of rules governing the organisations of the masters and men was regarded by the trade generally as a matter for congratulation, and already has operated usefully in a dispute which arose. The Bristol Sanitary Committee is taking powers for certain by-laws regarding building materials, hitherto not held in Bristol, though they are in force in the suburban jurisdictions. The details of the proposed new rules have not been yet reported to the Town Council, who at the last meeting decided not to sanction by-laws a copy of which was not before them.

MARBLE PULPIT, CRIEFF PARISH CHURCH.—On the 21st ult., the marble memorial pulpit for St. Michael's parish church, Crieff, Perth, was formally inaugurated. The pulpit is the work of Mr. D. Beveridge, sculptor, Perth. The body is of Sicilian marble, is Gothic in design, and octagonal in form. It is supported by eight columns of coloured marble, while the lower base is formed of polished Peterhead granite. The front panel bears a figure in relief representing the Saviour delivering the Sermon on the Mount, and is from the chisel of Mr. Stevenson, Edinburgh.

RE-OPENING OF BREAGE CHURCH.—Breage Church, Cornwall, was reopened on the 26th ult., after renovation. The church has been re-seated throughout by new, open sittings, made of oak. The carved panels of the old pews have been utilised for a dado round the church. New rood and tower screens have been provided. The rood screen and carved reredos were supplied by Messrs. Cox, of London, who have also done the decorative painting in the chancel. The roof of the sacristy has been repaired, the original character being maintained. A new pulpit has been erected, the base being of local granite, and the upper part of polyphant, the panels being filled with polished Duporth stone. The church has been retiled. The alterations were carried out under the supervision of the Rev. Ernest Geldart, of Little Braxted, Essex, by the contractor, Mr. Julian, of Truro. During the restoration there were found on the walls four frescoes, representing Our Saviour, St. Christopher, St. Michael, and the first Bishop of Cornwall. There were also discovered the tombs of Margaret Godolphin and five other members of the Godolphin family. The inscriptions, it is stated, are to be carefully reproduced and placed in suitable positions in the church. The total cost of the alterations, including a new organ, has been about 3,000*l.*

HOSPITAL, SEAMEN'S HOMES, EGREMONT.—Some time ago (says the *Liverpool Daily Post*) it was announced that Mr. William Cliff had decided to add a hospital wing, at a cost of 2,000*l.*, to the Cliff Home, among the Homes for Aged Mariners at Egremont. This necessary adjunct to the home has been specially supervised by the honorary medical officers to the institution, Dr. Bell and Dr. Hubbard. It includes an arrangement of classified wards connected by a long corridor with the south side of the main building. The ground-floor accommodation comprises an entrance-hall and staircase, with two wards — each 24 ft. by 18 ft. — and an intermediate nurses' room. A corridor leading out of the hall connects the kitchen, surgery, bath-rooms, &c., and there is also a mortuary, approached from the outside. The first floor contains similar accommodation, and the wards are lofty and well lighted. The elevation of the building, which has been designed to harmonise with the main façade, is well broken up, having a large oriel window,—the height of two storeys,—to the river front. Red Ruabon bricks and Stourton stone dressing for the windows and other features have been used, and the roofs, which are hipped, are of green slate, with red ridges. The works have been carried out by Mr. Pritchard, of Little Neston, from designs prepared by Mr. David Walker, of Liverpool, the architect to the institution.

NEW BAKERY AT NEWPORT (Mon).—*The Western Mail* describes a new "hygienic bakery" which has been erected at Newport (Mon.) for Mr. Alfred Bland from plans by Messrs. Habershon & Fawckner, architects, London, Mr. John Linton being the builder.

BRADFORD ABBAS CHURCH.—The parish church of St. Mary, Bradford Abbas, was re-opened on the 11th ult., after restoration. The church, a fine Perpendicular structure, consists of chancel, nave, and aisles, with an embattled tower. For some years past it has been falling into disrepair, and in 1883 the vicar (the Rev. Gordon Wickham), together with the churchwardens and a number of the leading parishioners, started a restoration fund, towards which the Warden of Winchester College (the living is in the gift of the College) was the first subscriber. When 400*l.* had been gathered, Mr. A. W. Bridge, lord of the manor of Clifton Maybank, offered to give the 700*l.* which was required to make up the 1,100*l.* which was needed, and the work of restoration was commenced early in 1890, from plans prepared by Mr. C. B. Benson, and under the contract of Mr. J. Andrews, of Thornford. Mr. Benson's first plans suggested the use of oak tie-beams and king-posts in the place of the iron rods which had been placed of late years to support the roof. These plans, however, were subsequently modified, and in order to preserve the character of the roof iron rods were again resorted to, their position being improved. Most of the old timbers were found to be too full of dry-rot to be used again, but the mouldings and carvings have been carefully copied. The carving has been mainly done by Messrs. Grassby & Son, of Dorchester, and six of the angels by Mr. Harry Hems, of Exeter. The painting and decoration of the interior of the edifice have been carried out under the personal superintendence of Mr. W. Raymond (Raymond & Penny, Yeovil). Formerly the whole of the roof was decorated, the panels having red and white roses alternately, and the main and intermediate beams being painted in the "barber's pole," or "ribboned" fashion. There were also a number of carved angels holding shields or scrolls. On removing the old paint from some of these shields the coats-of-arms of Devon (Courtenay), Mortimer, and Montague (Sandwich) were found. The roof is now of new oak with no decoration, except in places where the old beams were not too rotten to be re-used, and these retain their former appearance. The coats-of-arms unexpectedly revealed have been faithfully reproduced, and, in addition, the following now appear: Winchester College, Sarum, Horsey, Clayton, Williams (vicar *res.* 1826), Bridge, Lothian, and Talbot. In the chantry, the principal bosses have been richly gilded (the gift of Mr. W. Raymond), and the angels with shields, and the old monograms found on the latter—"J. S.," John Saunders, Abbot of Sherborne, and a trade-mark of the West of England Linen Company—have been retained. The hot-water pipes for heating the edifice, which formerly ran up the centre of the nave in full view, have been moved to the sides of the church, and three additional coils have been fixed by Mr. Read, of Sherborne. The work of re-hanging the peal of bells and of putting them into serviceable condition was entrusted to Messrs. Gillett & Johnston, of Croydon.

PROPOSED PUBLIC OFFICES FOR DRIGHLINGTON.—A public inquiry was held on the 16th ult. by Colonel J. C. Hasted, R.E., one of the inspectors of the Local Government Board, with reference to an application by the Drighlington Local Board for sanction to borrow 1,150*l.* for providing public offices. The chairman of the Board (Mr. L. J. Booth) and other principal ratepayers were present. After taking the evidence of one or two members of the Board in support of the application, to which there was no opposition, the Inspector went over the premises agreed to be purchased, and he will shortly make his report.

SANITARY AND ENGINEERING NEWS

PROPOSED SEWAGE TREATMENT WORKS FOR PUDSEY, STANNINGLEY, AND FARSLEY.—The *Leeds Mercury* reports that at the meeting of the Farsley Local Board, held on the 15th ult., a letter was read from the Clerk to the Pudsey Local Board, in which it was stated that their Sanitary Committee were of opinion that a joint scheme of works for the treatment of sewage from those portions of the Pudsey and Farsley Local Board districts, and that portion of the Leeds Corporation district, which are contiguous to one another at Stanningley, could be worked with advantage to all three local authorities at some point in the valley, before the beck reaches the river. The Board decided to receive a deputation from the Pudsey Board to discuss the question.

NUNEATON SEWERAGE WORKS.—On the 18th ult., Mr. J. Thornhill Harrison, one of the engineering inspectors of the Local Government Board, held an inquiry at Nuneaton into the application of the Local Board for permission to borrow 1,350*l.* for improvements at the sewage works and in various parts of the district. The Local Board was represented by Alderman Haddon (chairman), Rev. Mr. Swinnerton, Mr. J. Estlin (Clerk), and Mr. J. S. Pickering (Surveyor). The only item to which the Inspector took exception was one of 220*l.* for renewals to the machinery at the sewage works, it transpiring that the engines were purchased by a loan repayable in thirty years, and that this had not been cleared off. It was understood that the Local Government Board would be recommended to consent to a loan for the various other matters.

THE GLASGOW SEWAGE BILL.—The Glasgow Police (Sewage, &c.) Bill, which has just been deposited, has for its object to authorise the Magistrates and Council as Police Commissioners to acquire lands for sewage purposes, and to raise money for that purpose. The Bill is divided, according to the *Glasgow Herald*, into three parts:—I. Sewage purposes; II. Police purposes; III. General. Under the first heading power is asked to acquire certain lands in the Bridgeton district for the purpose of erecting thereon works for the treatment of sewage, and also to borrow for sewage purposes a sum not exceeding 100,000*l.* on security of the sewage assessment; this loan to be paid off by the application of a sinking fund at the rate of 3½ per cent. on the amount for the time borrowed under the Act. An additional assessment not exceeding 2*d.* in the *l.*, payable in equal proportions by proprietor and occupier, is also provided for. Under the second heading the Police Commissioners ask power to purchase and utilise, if necessary, lands for the disposal of the city manure, as well as to borrow 100,000*l.* for general Police purposes, for the paying off of which a 2½ per cent. sinking fund is provided. The other sections of the Bill have reference to the amendment of previous Acts and the administration of the funds of the Police Commission.

STAINED GLASS AND DECORATION.

NEW WINDOW, CHRIST CHURCH, SOUTHPORT.—Christ Church, Southport, has been provided with a stained glass window, as a memorial of the late Rev. Arthur Pearman. The subject represented is the "Good Shepherd," the artists being Messrs. Heaton, Butler, & Bayne, of London. The window has been placed in the south side of the church.

MEMORIAL WINDOW, QUORNDON CHURCH.—A stained glass window has recently been placed in Quorndon church, Leicester, to the memory of the late Rev. Robert Stammers, M.A. The window (one of two lights) is filled with figures of St. Paul and St. Bartholomew, with small subjects underneath. The windows were entrusted for execution to Mr. Herbert Gardiner, of Leicester.

FOREIGN AND COLONIAL.

FRANCE.—M. Antonin Mercié has been entrusted with the commission for the national monument to Joan of Arc to be erected at Domrémy. M. Jules Ferry, President of the Conseil Général and a former Minister of Fine Arts, is shortly to meet M. Mercié at Domrémy to settle with him as to the site of the monument, which will be in marble, and the pedestal in Vosges granite without any ornament.——M. Eugène Guillaume, who has been appointed director of the École Française at Rome, has sent to the Comédie Française, as a parting gift, the bust of the late Emile Perrin, former administrator of that theatre.——The "Leda" of M. Roulleau, one of the finest works in marble in the East Salon, has been offered by the State to the Museum of Sculpture at Amiens.——M. Ringal, sculptor, has been commissioned by the Duchesse de Pomar to execute a marble statue of Marie Stuart, which she proposes to present to the city of Paris.——The Professorship of Archæology at the Bibliothèque National, which was filled by M. Carl Wescher, has been allowed to lapse.——The death is announced of Mdme. Daubigny, widow of the eminent landscape-painter.——A committee of the friends and admirers of Alphonse Karr, the novelist, has been formed to procure the erection of a monument to his memory at Saint Raphaël (Var).——The Municipal Council of Dijon has voted the demolition of the château commenced there in 1478 by Louis XII., which, after having served as a State prison, had been subsequently a barracks for gendarmerie. This building, long since closed as a "Monument Historique," had fallen into ruin, and as it was decided that it could not be usefully restored, it was "de-classed" by the Ministry of Public Instruction.——The death is announced of M. Emile Richard, President of the Municipal Council of Paris, formerly President of the Commission des Beaux-Arts, and author of the report on the artistic decoration of the Hôtel de Ville.——Following on the competition recently decided at the Hôtel de Ville, of which the results have been already given, the "Société Française des habitations à bon marché" has just opened, to the whole of France, a second competition which will comprise three sections: 1st, an enquiry into the state of cheap houses or "logements à bon marché" in town and country during the past fifty years; 2nd, designs for such houses both in blocks and isolated; 3rd, the financial combinations to be adopted for erecting such buildings on a remunerative basis.——The "Société Protectrice des Monuments Rouennais" has addressed to the Municipal Council a memorial for the erection at Rouen of a statue to Fontenelle, author of the "Entrétiens sur la pluralité des Mondes," whose name is already given to a street in the town.——Some interesting statues have just been discovered a Martres-Tolosane (Haute Garonne), especially a fine statue of Minerva, a bust of an Emperor, and many bas-reliefs and fragments of statues. These have been found close together at a depth of 3 to 4 mètres below the surface of the ground. The absence of any foundations or other architectural remains has led to the conclusion that this was the site of a large sculptor's atelier rather than of a mansion.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
Baths at Woodside	Halifax Corporation..	.....	Feb. 14
*New Municipal Buildings, Police Court, &c	Bury Corporation	150*l.* 100*l.* and 50*l.*...	Mar. 31

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Re-building a Mill, Longhill, near Llandbryd, N.B.	.....	A. & W. Reid	Jan. 6
Two Shops and Dwelling-house, Pontypridd	Robt. McIntosh	Fred. Gibson	do.
Steel Rails, Fishplates, &c.	India Office	*Official*.....	do.
Iron Castings, &c.	Manchester Corp.	do.	Jan. 7
Marine Hotel, Ballycastle, Ireland	.....	Henry Seaver	do.
*Sewerage Works	Epping R.S.A.....	Edmund Egan	Jan. 8
Road Materials	Dorset County Council	*Official*	do.
Alterations to Top Lodge, Queen's Park..	Manchester Corp.	do.	do.
Ironwork, &c. Mount-street Open Space	do.	do.	do.
*Making up Roads.	Wood Green Loc. Bd.	C. J. Gunyon	Jan. 9
*Supplying Tables	School Bd. for London	*Official*.....	do.
Explosive Mechanite, Pentrybedmdfrath, Merioneth	Jas. R. Watson	A. Roberts	do.
House, West End, Fernes N.B.	Mr Taylor	do	do
*Sea Defence Works, Walton on the Naze..	Improvement Commrs.	*Official*.....	Jan. 10
*New Bridge over River Stour, &c.....	Essex County Council	F. Whitmore	do.
*Chapel at New Cemetery, Morden.....	Battersea Burial Bd.	*Official*	Jan. 12
*Sewerage Works	Teddington Local Bd.	H. York.....	do.
New Service Reservoir (30,000 gallons) and Pipes, Alnmouth.....	Alnwick U.R.S.A.....	F. R. Wilson	do.
Steelwork for Bridges, &c.	India Office	*Official*.....	Jan. 13
Work at Roup Reservoir, near Leeds ..	Leeds Corporations ..	Thos. Hewson	do.
*Sewerage Works	Tottenham Local Bd.	J. E. Worth	do.
*Works and Materials	Wandsworth Bd. of Wks	*Official*	do.
*Main Drainage Extension	West Ham Council ..	Lewis Angell	do.
*Execution of Works for Three Years	Hackney Bd. of Works	J. Lovegrove	Jan. 14
Stores, Offices, &c.	Witney Black Side Indus. Co-op. Soc. ..	John Drake	do.
*Removal of Dirt, Dust, Ashes, &c.	Crown Estates Paving Commrs.	*Official*	do.
*Roadmaking and Paving Works.....	Hammersmith Vestry	H. Mair, C.E.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Re-building Portions of Reformatory, Kingswood, near Bristol	Committee	H. C. M. Hirst.....	Jan. 16
Offices, Workshops, &c. Western-road, Reading	Henry Lewis.....	W. H. Bell	do.
*Irrigation Works	Met. Asylums Board..	*Official*	do.
*Erecting and Completing Boundary Wall, Railing, and Entrances to Churchyard	Commrs. of Sewers ..	do.	Jan. 16
*New Post Office, Stratford-on-Avon	Com. of H.M. Wks, &c.	do.	do.
Gas Mains, Fittings, &c.	Ashby-de-la-Zouch Union	do.	do.
Villa Residence, Buckfastleigh	.....	Michelmore & Son....	Jan. 17
*Drainage Works, Battersea-park	London County Council	*Official*	Jan. 19
*Public Conveniences, Dulwich park.....	do.	do.	do.
*New Police Station, &c. at Leek.....	Staffs. County Council	W. Sugden & Son	Jan. 22
*Erection of Houses, &c. Lydd, near Kent	Admiralty.....	*Official*..	Jan. 23
*Improvement of River Lea	Birmingham Public Works Com. ..	W. S. Till	Jan. 24
Convalescent Home, Lanark	Glasgow Western Infir.	H. Herbertson & Co...	No date
Villa Residence, Roundhay-road, Leeds ..	Mr. Hutton	.. .. ..	do.
*Supply of Materials and Execution of Works.....	Liverpool Corp.	*Official*	do.
Mansion, near West Hartlepool	.....	J. Bargeant	do.
Additions and Alterations to "Hexham House," Newcastle-on-Tyne	.....	B. F. Simpson.....	do
Ironwork Stores, &c. Marsden, South Shields	Whitburn Coal Co Ltd.	....	do.
Enlargement of Chancel, New Vestries &c. St. Paul's Church, Holgate, York	.....	Demaine & Brierley ..	do.
Forming and Sewering, Oxford-street, Workington	.....	R. H. & H Hodgson..	do.

PUBLIC APPOINTMENTS.

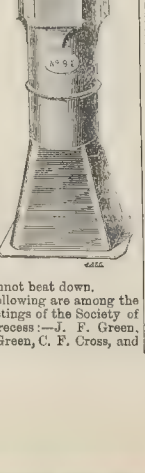
Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
Sanitary Inspector	Dumbarton C. C.	200*l.*	Jan. 6
Two Sanitary Inspectors	Renfrew C. C.	125*l.*	Jan. 10
*Clerk of Works	Hymer's College, Hull	2*l.* 3*s.*	Jan. 13
*Accountant Clerk.....	Civil Service Com.....	Not stated	Jan. 14
*Surveyor's Assistant	Burton-on-Trent Coun.	150*l.*	do.
*Borough Engineer and Surveyor	Reading Council....	400*l.*	Jan. 17

Those marked with an Asterisk (*) are advertised in this Number. Competition, p. iv. *Contracts, pp.* iv., vi., viii., x., *and* xii. *Public Appointments, p.* xxvii.

PRETORIA, SOUTH AFRICA.—New market buildings are about to be erected here. The site of the buildings is on the Market-square, at the corner of Church-street and Van der Walt-street. The two principal frontages are respectively 300 and 250 ft. in length. In the centre of the site is the market house for whites, and to the smaller one adjoining it for coloured people. The former measures 155 ft. by 60 ft., and has a roof in one span. At the western corner is a clock tower about 70 ft. high. The style of the building is described in a local paper as of a Free Dutch Renaissance, the material being red brick and stone. The ground-floor of the frontages is occupied entirely by shops, with a bar or restaurant at the corner. The cost of the entire building will be about 36,000*l.* The architects are Messrs. Campbell & Dickson, A.R.I.B.A., and Frank Emley.——The Pretoria Waterworks and the railway from the Vaal River to Pretoria are both in course of construction; to the former of which Messrs. Campbell & Dickson, A.R.I.B.A., are the Resident Engineers, Mr. Pritchard, of London and Birmingham, being the Consulting Engineer in England. The railway is under Hollander management, the contractors being, however, English. Our informant is good enough to add, "We find your paper a great solace to us in this somewhat prosaic country."

MISCELLANEOUS.

BERRY'S IMPROVED WINDGUARD. This windguard, manufactured by Messrs. Z. D. Berry & Sons, of Regency-street, Westminster, appears to possess some good points. The inventor claims that, after repeated experiments, extending over twenty years, he has succeeded in making a windguard which has at last solved the vexed problem,—how to cure smoky chimneys. A fatal fault in many cowls and windguards hitherto made has been, that the wind at some point or angle could strike down the chimney; this, however, it is urged, has been rendered impossible by the construction of "Berry's" windguard, which also claims to possess the advantage of acting as a powerful exhaust, accelerating an up-current, and acting as a ventilator, independent of the fire being lighted. Other points claimed are—1st, that it cannot be injured in sweeping the chimney. 2nd, that it is noiseless, does not revolve, and having no movable parts, cannot get out of order. 3rd, that the rain cannot beat down.



SOCIETY OF ARTS.—The following are among the papers to be read at the Meetings of the Society of Arts, after the Christmas recess:—J. F. Green, "Steam Lifeboats;" A. G. Green, C. F. Cross, and E. J. Bevan, "Photography in Aniline Colours;" Carmichael Thomas, "Illustrated Journalism;" T. Emerson Dowson, "Decimal Coinage, Weights, and Measures;" Sir Roper Lethbridge, M.P., "The Proposed Irish Channel Tunnel;" Wm. Topley, F.R.S., "The Sources of Petroleum;" Colonel Sir Charles Wilson, K.C.B., K.C.M.G., F.R.S., "Methods and Processes of the Ordnance Survey;" E. J. Ravenstein, "Lands available for Colonisation;" Prof. J. J. Hummel, "Fast and Fugitive Dyes;' William Robinson, "The Use of Petroleum in Prime Motors;" J. Harrison Carter "Milling Machinery;" F. H. Cheeswright, "Breakwaters." The next series of Cantor Lectures will be by Mr. A. J. Hipkins, F.S.A., on "The Construction and Capabilities of Musical Instruments." The course of three lectures will commence January 26.

ELECTRIC LIGHTING IN ST. PANCRAS.—An important scheme of electric lighting has been undertaken by the Vestry of St. Pancras. Professor Henry Robinson (the Electrical Engineer to the Vestry) states that the installation which is now being carried out by the Vestry under his direction will serve the south-western part of the parish, and is intended to be followed by further stations to serve the rest of the district if the results were proved to be as satisfactory from a commercial standpoint as was anticipated. He has adopted the "continuous current," and has fixed the electromotive force at 110 volts, to suit incandescent lamps. The mains will be laid on what is known as the "three-wire system," by which arrangement the current is transmitted from the central station at 220 volts along the two outside wires, whilst the third wire is kept at an intermediate potential differing from that of either of the outside wires by 110 volts. The lamps are in electrical contact with either of the outer wires and with this third wire. Half the lamps are connected to one outside wire and half to the other. In the event of the demand being greater on one side than the other, it is met by a supply from the station along the third wire. This arrangement enables current to be supplied at 220 volts for purposes of motive power and arc lights in addition to the supply at 110 volts for incandescent light ing. This is claimed to be by far the most efficient and economical system of distributing electrical energy under conditions which obtain in St. Pancras. The central station plant will be capable of supplying low-tension current to serve 10,000 incandescent lamps of 16-candle power simultaneously, and at the same time high-tension current will be provided on a separate set of mains to serve public lights in the streets, to the extent of 90 tenampère arc lights, or a larger number of lamps of equivalent candle-power, at the outset. There will be nine low-tension and two high-tension dynamos,—one of each sort serving as a stand-by, or reserve. All the dynamos will be driven direct by triple expansion condensing engines. There will be six sets of batteries or accumulators (capable of serving 800 or 900 lights) to work all the lights in use at periods of minimum demand when the engines and dynamos would not be working, and they will further act as an additional stand-by, or reserve. Provision is made at the outset for five miles of distributing mains, which are designed to carry current for 25,000 incandescent lamps of 16-candle power in use simultaneously, and separate mains are provided for the public street lighting.

HISTORIC TAPESTRY BURNED.—The *Western Mail* reports that on Saturday night a fire broke out at Eastnor Castle, near Ledbury, the seat of Lady Henry Somerset. The fire broke out in the library, and two valuable pieces of tapestry, representing "Summer" and "Autumn," were much damaged before the flames could be extinguished. The tapestry formed a portion of a set of four pieces which came from Fontainbleau, and were worked during the time of Louis XV.

TWO NEW MEMBERS OF THE COURT OF COMMON COUNCIL.—Mr. C. Val Hunter, A.R.I.B.A., and Mr. Alexander Ritchie, of the firm of Steven Brothers & Co., iron founders, have been elected members of the Court of Common Council, as representatives of Castle Baynard Ward. The City *Press* says that both of them "ought to be valuable members of the Court, since they state that they know the importance of silence;" but we have no doubt that both gentlemen will speak out when they deem it necessary.

FIRE AT THE R.C. CATHEDRAL AT EDINBURGH.—A serious fire occurred suddenly at the Roman Catholic Cathedral in Broughton-street, Edinburgh, on the 28th ult., during the hours of service. The side chapel in which it broke out was entirely destroyed, the damage being estimated at 2,000*l.*

LEGAL.

PERMANENT STRUCTURES:

THE LONDON COUNTY COUNCIL *v.* KNOWLES.

At the Thames Police-court, on December 23, Mr. Clarence Charles Knowles, carrying on business at London Wharf, West Ferry-road, Millwall, was summoned before Mr. Mead at the instance of the London County Council, for erecting certain temporary wooden structures without having obtained a licence from the County Council to do so. Mr. Chilvers appeared to prosecute on behalf of the County Council, and Mr. Percy Gye, barrister, instructed by Mr. W. D. Styer, defended.

Mr. John Clarkson, District Surveyor for Poplar, said that on July 29 last he called the attention of the Council to the erection of certain structures on defendant's premises. They consisted of pieces of timber 7 in. by 2½ in. let into the ground. They were 13 ft. in height, and cross pieces 4 in. by 2 in. each were nailed to them. There were three rows, and there were gangways between them. The space covered by the structures was about 60 ft. by 50 ft. They were used for drying old sacks. They were close to St. Luke's Schools and Messrs. Bullivant & Co.'s works. In witness's opinion the structures were of a temporary character. There were no foundations to witness's knowledge.

Cross-examined by Mr. Gye, witness said he could not say if the posts went into the ground a distance of 3 ft. If they did, witness would not say that made them permanent structures. When posts were let into the ground it rotted them. If the posts were properly treated they would probably last for years. Witness could not say if they had been creosoted. As a matter of fact, he knew nothing of the posts below the ground.

By the Magistrate: If the structure would last twenty, thirty, or fifty years, witness was of opinion that it was temporary. He considered permanency began at a hundred years. If properly creosoted, the structures would last about twenty-

five years, but if they were not they would only last three or four years.

Mr. A. Dovaston, surveyor in the office of the London County Council, said he had surveyed the structures, and was of opinion they were of a temporary character. In case of fire there would be danger to Messrs. Bullivant's premises and to St. Luke's Schools. He saw no evidence of the posts having been creosoted. No consent had been given by the London County Council for their erection.

In cross-examination, the witness said in his opinion all wooden structures were temporary.

By the Magistrate: He would not say that old Putney Bridge, which was of wood, was temporary.

For the defence, Mr. Gye submitted that the prosecution had no case, and that these structures did not come within the meaning of the Act. They were not of a temporary or movable character, but were intended to last as long as the business was carried on. The business could not be carried on without them, as they were used for drying sacks, and they really formed part of the plant.

Mr. T. W. Price, F.S.I., the managing clerk to Mr. Bradshaw Brown, of 59, Fenchurch-street, E.C., was called for the defence and supported the statement of the counsel that the structures were permanent. The posts were properly creosoted. He considered that the structures in question having been erected for the purpose of carrying on a particular business should certainly be looked upon as plant, and could not come under the clauses of the Building Acts.

In cross-examination as to whether he would consider advertisement hoardings permanent structures witness gave it as his opinion that they were temporary structures as they were invariably erected for a short period only.

Having heard other evidence for the defence,

Mr. Mead said he had come to the conclusion that these summonses must be dismissed. He was of opinion that the structures were of a permanent character and not temporary. He considered that if they would last twenty-five years that was long enough to make them permanent. He also considered that all precautions were taken, and in the ordinary course of things the structures were likely to last for a term of twenty-five years. Another thing to be taken into consideration was the purpose for which they were erected, and he (the magistrate) considered the purpose in this case made them permanent. The summonses would, therefore, be dismissed, and he would grant the defendant three guineas costs.

In reply to Mr. Cuilvers, the magistrate refused to grant a case.

MEETINGS.

MONDAY, JANUARY 5.

Surveyors' Institution.—Mr. L. P. Hodge on "The Rights and Liabilities of Adjoining Owners with Regard to Highways." 8 p.m.

Clerks of Works' Association (*Carpenters' Hall*).—Monthly meeting. 8 p.m.

TUESDAY, JANUARY 6.

Manchester Architectural Association.—Mr. S. S. Platt on "Paving Stones." 7.30 p.m.

Glasgow Architectural Association. — Mr. Robert Miller on "Statica." 8 p.m.

WEDNESDAY, JANUARY 7.

British Archæological Association.—(1) Mr. G. Payne, F.S.A., on "The Durden Collection;" (2) Mr. J. H. Macmichael, on "The Tradesmen's Signs of Old London." 8 p.m.

South Kensington Museum (*Lecture Theatre*).—Mr. Maurice Hewlett on the "Rise of the Renaissance in England." I. 3.45 p.m.

THURSDAY, JANUARY 8.

Society of Antiquaries.—8.30 p.m.

FRIDAY, JANUARY 9.

Architectural Association. — Mr. J. A. Powell on "Opaque Glass." 7.30 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

734.—SYPHON FLUSHING APPARATUS: *W. R. & J. J. Rawlings.*—According to this patent, one or more capillary or flattened tubes open at the upper end into the upper part of the syphon, preferably on the discharge side. The lower end of the tube or tubes terminates slightly above the inlet opening of the syphon, and is surrounded with a wire cage or similar device when there is a possibility of the tubes becoming choked or stopped from the presence of suspended or floating matter in the water.

746.—SASH-BARS AND GLAZING: *L. Fawthrop.*—This invention relates to the bars for supporting the sheets of glass and for holding them down; the object being to provide against any dripping from condensation on the under surface of the glass. This is effected by an improved form of sash-bar, which combines a rest or support for the sheets of glass, below which is a channel for receipt and conduct of the water of condensation.

3,942.—JOINING LEAD PIPES: *G. H. Smith and B. Cooper.*—The respective ends of the pipes are, according to this invention, formed with a thread in connection with a coupling formed in white metal, the interior of which is threaded; or in another way the threads on the pipe ends are formed by reducing the exterior diameter by compression, and afterwards placing it in a die formed with a thread, and expanding the pipe therein by internal pressure. The same form of screwed ends is not only applied to pipes in lengths but is used for angles and bends.

13,007.—METAL LATHING: *W. W. Bostwick.*—The laths are formed with corrugations and V shaped projections and the specification describes machinery specially adapted for making them in this form.

16,113. CONVERTIBLE LADDERS, &c.: *C. Ward.*—These ladders, which may be used separately, can also be combined by bolts and stays to form a pair of steps when desired.

16,117.—DOOR AND WINDOW FASTENER: *F. Weiss.*—To prevent rattling and secure the door or window in an open position, a fastener is made so that the catch can be passed from both sides over the knob of a projector and the door or window firmly secured.

16,231.—BRICK KILNS: *P. Crean.*—According to this invention, two series of small openings or flues are provided in the kilns, and gratings are raised above the floor of the kiln so as to allow air to pass in to assist combustion. When burning the bricks, instead of the furnaces being constantly open and kept fed with fuel they are closed immediately after the kiln has been steamed, or about thirty-six hours after being lighted, and the necessary heat is maintained by introducing small quantities of slack or coal-dust through the flues. These flues or openings can also be used for cooling purposes when required.

NEW APPLICATIONS FOR PATENTS.

December 15.—20,409, W. McGie, Preventing Blowdowns in Chimneys.

December 16.—20,475, J. Leather, Ventilating Structures. — 20,477, P. Lawrence, Producing Ornamental Designs in Wood, &c.—20,492, C. Vollman, Pipe Connections.—20,506, J. Bautier, Window Sashes.—20,523, J. Fairfax, Portable Buildings.—20,534, N. Hodges, Protecting Buildings from Lightning.

December 17.—20,554, J. Boot and W. Clark, Fire Grates.—20,559, W. Scott Moncrieff, Water Waste Preventing Cisterns.—20,611, E. Lucas, Wall Decorations. —20,627, J. Bayly, Chimney Cap and Ventilator.—20,633, R. Stanley, Boring and Tunnelling Machines.

December 18.—20,649, B. Giraud, Gutter Bricks.—20,661, J. McGlashan, Ventilating and Chimney Cowls. —20,700, H. Lake, Flooring for Stables, &c.

December 19. 20,717, J. Chorlton & G. Scott, Step Ladders.—20,730, C. Darrah, Ventilating and Illuminating Closed Shop Windows and Shop Fronts.—20,739, J. McGlashan & E. Braidwood, Painters' Brushes, &c.—20,763, A. Attwood & R. Jackson, Revolving Wood Shutters, &c.

December 20.—20,780, J. Bayly, Flushing Apparatus.—20,799, J. Bayly, Brick Kiln. —20,812, J. Sowden, Affixing Sash Lines to Window Frames, &c.—20,814, T. Clarke, Chimney Pots.—20,830, H. Bayley, Electric Ceiling Roses and Wall Connectors.—20,831, W. Oakley & C. Spurrier, Electric Ceiling Roses and Wall Connectors.

PROVISIONAL SPECIFICATIONS ACCEPTED.

17,956, D. Corley, Screw for Securing Roofs.—18,106, T. Harrison and W. Chaloner, Chimney-tops.—18,433, J. Raffety, System of Ventilation.—18,643, S. Bourne and G. Leonard, Fire-places or Stoves.—18,725, E. Ward, Flush Cisterns.—18,796, J. Benford, Locking Sash-fastener and Electrical Alarm and Indicator for Windows, &c.—18,813, A. Steele, Stoves or Fire-grates.—18,927, G. Webley, Escape from Burning Buildings.—18,939, R. Gregory and H. Harris, Ventilating Air-pipe and Cowl.—19,056, G. Kincaid and H. Gonjon, Lining Brush Attachment.—19,599, F. Beech and H. Dixon, Automatically Supplying Fuel to the Fires of Kilns, &c. —19,712, J. Bayly, Roofing.—19,741, W. Press, Sash-Fasteners.—19,752, F. Hadfield, Screws for Wood, &c.—19,897, J. Libby, Chimney-top, Cowl, or Windguard, for Preventing Downdraught.—20,178, G. Farrow, Portable Stage, Scaffold, or Skeleton Tower, to be employed in repairing the interior of lofty buildings, and for other uses.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

20,711, S. Danischewsky, Door Fastener.—985, H. Grimshaw, White Pigment.—2,542, F. Bird, Sewer Ventilation Columns or Shafts.—2,739, E. Ingham, Draught Preventers.—2,787, E. Seddon, Apparatus for Sand-Papering Wood.—3,075, G. Light, Intercepting Taps for Drains, &c.—3,431, J. Naylor and H. Williams, Moulding and Pressing Semi-Dry Bricks.—6,918, G. Deacon, Strips or Bars for Glazing Applicable to Rafters, &c.—18,553, G. Meyer, Door-Springs.—18,609, J. Bond, Drying Bricks, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	15	0	7	5	0
Teak, E.I. ....load	10	0	0	13	0	0
Sequoia, U.S. ....foot cube	0	2	8	0	3	0
Ash, Canada ....load	2	10	0	4	5	0
Birch ,, ...load	2	5	0	4	5	0
Elm ,, ...load	3	10	0	4	15	0
Fir, Dantzic, &c.	2	0	0	3	15	0
Oak ,, ...	2	10	0	4	10	0
Canada	4	17	6	6	10	0
Pine, Canada red	2	10	0	3	10	0
,, yellow	2	0	0	3	10	0
Lath, Dantzic ....fathom	5	0	0	6	0	0
St. Petersburg	5	0	0	7	0	0
Deals, Finland, 2nd & 1st. std. 100	7	10	0	10	0	0
,, ,, 4th and 3rd	7	0	0	7	5	0
Riga	6	0	0	8	0	0
St. Petersburg, 1st yellow	9	10	0	14	10	0
,, ,, 2nd ,, ...	7	10	0	9	0	0
,, ,, white	7	0	0	10	0	0
Swedish	7	0	0	15	10	0
White Sea	8	0	0	17	0	0
Canada, Pine, 1st	18	0	0	24	0	0
,, ,, 2nd	9	0	0	16	0	0
,, ,, 3rd, &c.	7	0	0	10	0	0
,, Spruce, 1st	8	10	0	10	10	0
,, ,, 3rd and 2nd ..	6	10	0	8	0	0
New Brunswick, &c.	5	10	0	7	10	0
Battens, all kinds	4	10	0	15	10	0
Flooring Boards, sq., 1 in., prepared, First	0	10	0	0	14	0
Second	0	8	0	0	10	6
Other qualities	0	5	6	0	7	9
Cedar, Cuba ....foot	0	0	4	0	0	5
Honduras, &c.	0	0	8½	0	0	4½
Mahogany, Cuba	0	0	4½	0	0	6½
St. Domingo, cargo average ..	0	0	4½	0	0	6½
Mexican ,, ...	0	0	4½	0	0	5½
Tobasco ,, ...	0	0	5½	0	0	6½
Honduras ,, ...	0	0	5½	0	0	6½

TIMBER (*continued*).	£.	s.	d.	£.	s.	d.
Box, Turkey ....ton	4	0	0	13	0	0
Rose, Rio	12	0	0	19	0	0
Bahia	10	0	0	18	0	0
Satin, St. Domingo....foot	0	0	9	0	1	3
Porto Rico	0	0	10	0	1	6
Walnut, Italian	0	0	4	0	0	7
METALS.						
IRON—Bar, Welsh, in London tn	6	10	0	6	17	6
,, ,, at works in Wales	6	0	0	6	10	0
,, Staffordshire, in London..	7	0	0	8	0	0
COPPER—British, cake and ingot	57	10	0	58	10	0
Best selected	59	0	0	60	0	0
Sheets, strong	53	0	0	0	0	0
Chili, bars	53	0	0	0	0	0
YELLOW METAL....lb.	0	0	6½	0	0	6½
LEAD—Pig, Spanish ....ton	13	2	6	13	5	0
English, com. brands	13	5	0	13	7	6
Sheet, English, 3 lbs. per square foot and upwards....	15	0	0	15	10	0
Pipe	16	10	0	0	0	0
ZINC—English sheet ....ton	27	5	0	27	10	0
TIN—Straits	90	15	0	0	0	0
Australian	90	15	0	0	0	0
English Ingots	0	0	0	0	0	0
OILS.						
Linseed ....ton	21	10	0	22	0	0
Cocoanut, Cochin	33	10	0	34	0	0
,, Ceylon	29	0	0	0	0	0
Palm, Lagos	26	0	0	26	10	0
Rapeseed, English pale	28	5	0	0	0	0
,, brown	26	15	0	0	0	0
Cottonseed, refined	18	5	0	0	0	0
Tallow and Oleine	21	0	0	40	0	0
Lubricating, U.S.	6	0	0	7	0	0
,, refined	7	10	0	12	0	0
TAR—Stockholm....barrel	1	1	0	0	0	0
Archangel	0	14	0	0	0	0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ABERAVON.—For rebuilding "Globe" Hotel, at Aberavon, for Mrs. Hannah Davies. Mr. George F. Lambert, architect, Bridge-end.

John Davies	£2,840	Morgan Cox, Aberavon* ..	£2 430
J. & S. Rees	2,750	Charles James..	2,360

* Accepted.

BRIGHTON.—For erecting houses and stabling in Florence road, for Mr. W. Fowler. Messrs. Pattick & Pattick, architects, 82, Queen's-road, Brighton :—

Hickmott & Son	£1,983	H. Hall & Son	£1,741
Cox & Sons	1,825	W. & A. Elliott	1,678
Preston	1,820	Wright*	1,625
Saunders	1,814		

* Accepted.

COLCHESTER.—For building boat department for the Co-operative Society. Mr. Geo. Lee, architect :—

S. Bloomfield	£410	G. Dobson	£270
R. Brown	401	Alex. Smith & Co.	
F. J. Ward	398	Undertaker*	267 10
G. Parrish	340		
F. Diprose	290		

* Accepted.

COLCHESTER.—For the erection of a pair of semi-detached villa residences in Beaconsfield-avenue, for Mr. H. E. Shaw. Mr. Chas. L. Butler, architect, Victoria Chambers, Colchester. Quantities supplied :—

G. Dobson	£360	E. Beaumont	£275
T. J. Ward	360	F. Diprose, Colchester* ..	255
C. E. Ordish	288		

* Accepted.

COLWALL (Hereford).—For the erection of factory and outbuildings at Colwall, for Messrs. J. Schweppe & Co., Ltd. Messrs. Truefitt & Truefitt, architects, 7, Bloomsbury square, London. Quantities by Messrs. Morris, Evans, & Son, 7, John street, Adelphi :—

Kendrick	£4,440	Ewral	£4 790
Bloor	4,251	J. Wood & Son, Worcester*	3,723
Estcourt & Son	4,047		
Colins	3,996		

* Accepted.

EARLSTON (N.B.).—For the execution of certain works at the parish church of Earlston, Berwickshire, for the Heritors of the parish. Messrs. Hardy & Wight, architects, 74, George-street, Edinburgh :—

A. T. Ingles & Son	£2,849 0 6
W. Rodger & Son, Earlston (accepted)	2,349 7 0

FROME.—For re-seating, new flooring, and other work at Holy Trinity Church, Frome, Somerset. Mr. W. G. Brown, architect :—

A. Clarke	£498	E. Seward	£440
T. Parfitt	[illegible]	Chislett & Son, Frome*	429
Jos. Bird	456		

* Accepted.

GUILDFORD.—For improvements to premises for Mr. J. Lympus, Spital-street, Guildford :—

D. Coker	£780	R. Wood	£247
G. Garlick	280	R. Smith (accepted)	218
S. Ellis	265		

HASLEMERE.—For erecting one pair of semi-detached houses for Mr. W. Heather, sen., Haslemere :—

G. Moore	£820	J. Marshall	£687
R. Pink....	744	F. Milton, Witley*	630

* Accepted, including pump, well, and steps.

HORNSEY.—For paving, kerbing, channelling, and making-up section No. 1 Parkham-road, for the Hornsey Local Board. Mr. T. De Courcey Meade, Engineer :—

Lewis Griffiths, Millwall, E. (accepted)....	£1,502 13 0

LEEDS.—Accepted for the erection of semi-detached villas, Roundhay, Leeds, for Mr. E. Holt. Messrs. John Hall & Son, architects, 72 Albion-street, Leeds. Quantities by architects :—

Tiles, Kitchen, *Bricklayer and Mason*....	£440 0 0
John Benton, *Carpenter and Carpenter*	240 0 0
A. Stephens, *Plumber and Glazier*	74 0 0
W. Evans, *Plasterer*	67 13 6
W. Walsh & Sons, *Painters*	21 10 0
J. Lesson, *Slater*	30 12 0

[All of Leeds.]

LONDON.—For laying out a recreation ground at Tench-street, Wapping, E., for the Limehouse District Board :—

Peart	£1,750	Kavanagh	£1,599
Measures	1,645	Willson, 277, Caledonian-street..	1,315
J. Biggs	1,590		

LONDON.—For alterations and additions to 14, Cockspur-street Pall Mall. Messrs. Glaister & Sons, surveyors :—

Clarke & Mannooch....	£1,497	F. G. Davis, Theobald's-road*	£1,147 10
J. F. Ford	1,447		
Holloway Bros.	1,312		

* Accepted.

LONDON.—For taking down and re-building Nos. 1 and 2, Harris-terrace, St. George's-in-the-East, for the Governors of Raine's Charities. Mr. A. Ashbridge, architect, 85, Leadenhall-street, E.C.:—
Chesher ..... £346 0 0 | Dawson £347 10 0
Hearle ..... 345 0 0 | Wilson, 277, Cubitt* 315 0 0
* Accepted.

LONDON. For repairs, &c., at 12, Wilson-street, Finsbury, E.C. Mr. H. Percy Monckton, architect, 32, Walbrook, E.C.:—
Wm. Pett ..... £130 0 0 | Bargman & Son £89 12 0
Harrison & Spooner (accepted) 87 0 0

MORPETH.—For alterations and additions to the "Newcastle House" Hotel, Morpeth, Northumberland, for Messrs. Jos. Sanderson & Sons. Messrs. Stockwell & Speer, arch. tects, 11, Pilgrim-street, Newcastle-on-Tyne. Quantities by the architects:
H. Brown & Co. ..... £808 7 0 | Jos. Straughan & Sons
Matt Routledge ..... 769 7 0 | Dudley, North-
T. W. Middleton ..... 754 16 3 | umberland* 640 15 0
Bryson, jun. ..... 694 1 1½ | Sidney Millard 628 7 0
W. & W. Scott ..... 681 14 9½ | *Accepted.

MORTLAKE.—For the supply and erection of sewage sludge pressing plant and machinery at the precipitation works, Mortlake, for the Richmond Main Sewerage Board. Mr. J. C. Mellins, engineer, 232, Gresham House, Old Broad-street, E.C.:—
Weyman & Co. ..... £1,801 0 | Mortimore, Allcott, & Co. £1,796 0
S. H. Johnson & Co. ..... Hubbard, Mabey, & Co.
Stratford, E.* ..... 1,825 0 | Warner 1,749 15
* Accepted.

PAIGNTON.—For erection of Mossage Hall, Paignton. Mr. George Sowdon Bridgman, architect. Quantities supplied by architect:—
C. & E. Drew ..... £77 | C. W. Perrett £695
R. Harris ..... 695 | Robbins & Brown (accepted) 663

PENZANCE.—For building dwelling-house, out-offices, and premises on the Leskidjack Estate, for Mr. R. Jo. Allen. Mr. J. Wm. Trounson, architect, 27, Clarence-street, Penzance:—
Wm. Pascoe ..... £1,775 | Waters, Burnett, & Co. ..... 1,674 | Walters £1,604
W. H. Stephens ..... 1,653 | Thomas & Bottrell 1,600
Wm. Ford, Penzance (accepted) £1,597 0 0

SALTASH.—For taking down old and erecting new dwelling-house at Boscadle, Northward, Saltash:—
Alfden, Saltash £670 0 0

SEVENOAKS.—For alterations and additions to Warren Cottage, near Sevenoaks, Kent. Mr. H. Percy Monckton, architect, 32, Walbrook, E.C.:—
Allerton & Sons £170 0 0
Iggulden, Wrotham (accepted) 296 0 0

STONE (Staffordshire).—For laying water-pipes at the Union Workhouse, for the Union Guardians. Mr. J. J. Chapman, engineer, Walton, Stone:—
H. McWhinnie ..... £200 3 4 | Wm. Smallwood, Stone* £180
Swift & Barlow ..... 180 0 0 | *Accepted.

TUNBRIDGE.—For the erection of a farm house near Tunbridge Kent. Mr. H. Percy Monckton, architect, 32 Walbrook, E.C.:—
Iggulden ..... £488 | Allcorn & Son, Shipbourne* £425
* Accepted.

WREXHAM.—For new offices for the Wrexham Water Works Company. Mr. Alfred C. Baugh, architect, Egerton-street, Wrexham:—

		Amended.
Parker Bros.	£2,997	£2,891
Hughes & Owen	2,971	2,740
Benj. Owen	2,962	2,732
J. Woolley	2,861	2,597
Brown & Backhouse	2,728	2,285
J. Gethin	2,661	2,245
Davies Bros.	2,345	2,140
W. E. Samuels, Wrexham (accepted)	2,130	2,025

WREXHAM.—For an arcade, for the Wrexham Arcade Company, Limited. Mr. Alfred C. Baugh, architect Egerton street, Wrexham:—
W. E. Samuel ..... £6,100 | Hughes & Owen £5,866
Benjamin Owen ..... 6,080 | Brown & Backhouse 5,770
Davies Bros. ..... 5,941 | J. Gethin 5,715

WREXHAM.—For rebuilding Busham Hall, for Mr. J. E. Edisbury. Mr. Alfred C. Baugh, architect, Egerton-street, Wrexham:—
Morrison & Sons ..... £2,354 | Davies Bros. £2,095
Brown & Backhouse ..... 2,165 | Thos. Hughes 2,084
Jno. Gethin ..... 2,154 | Hughes & Owen 2,000
Benj. Owen ..... 2,115 | W. E. Samuel, Wrexham* 1,890
* Accepted.

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TO CORRESPONDENTS.

W. S.—J. S. Son, & Co. (shall have early attention).—B. & G. (received). L. P. & Sons (our advertisement columns are open to you).—B. & G. (should have sent amounts).—E. P. L. B. (too late for this week).—H. H.-G. (too late).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PUBLISHER'S NOTICES.

Registered Telegraphic Address, 'THE BUILDER,' LONDON

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PREPAYMENT IS ABSOLUTELY NECESSARY.

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DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, but those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY morning.

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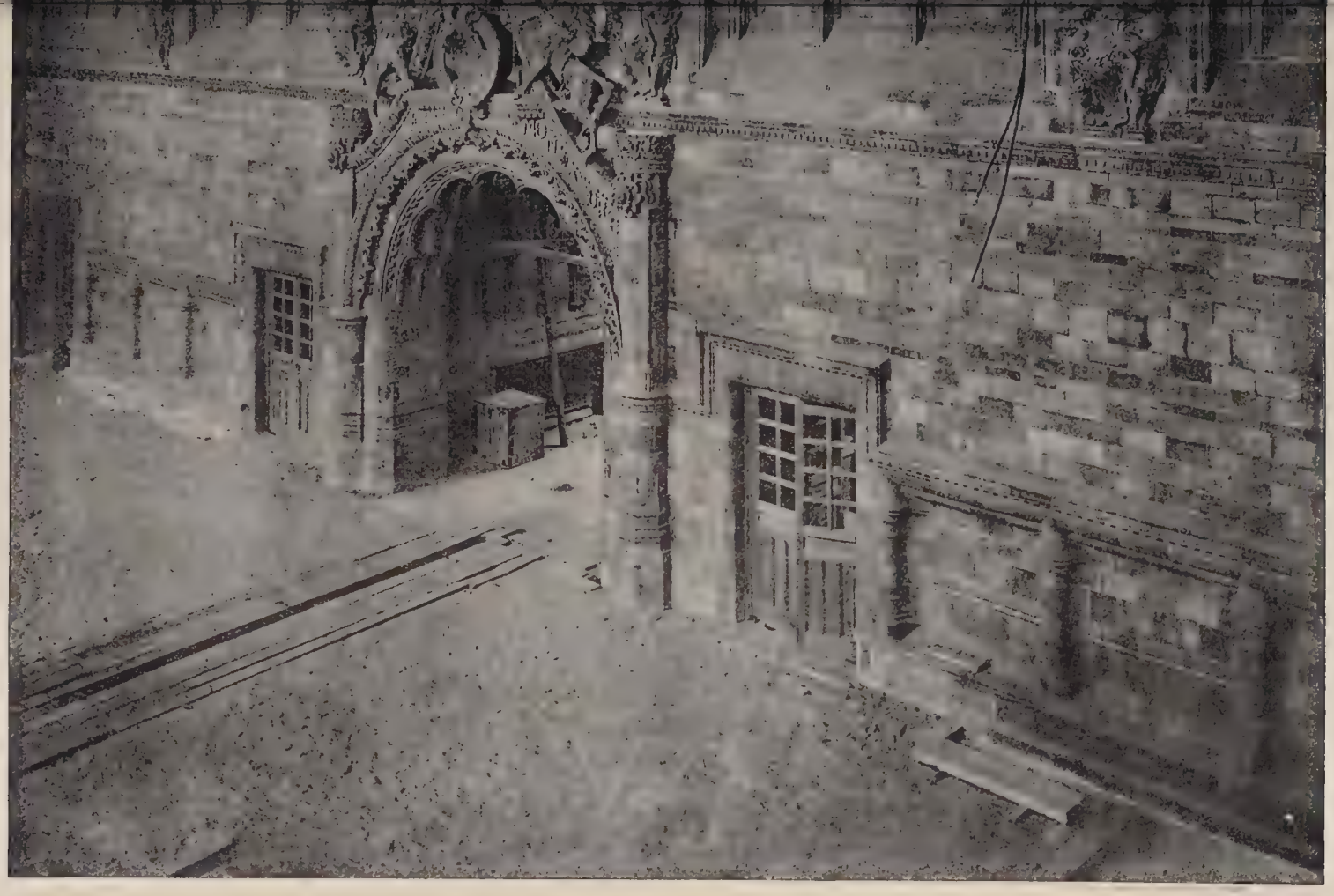
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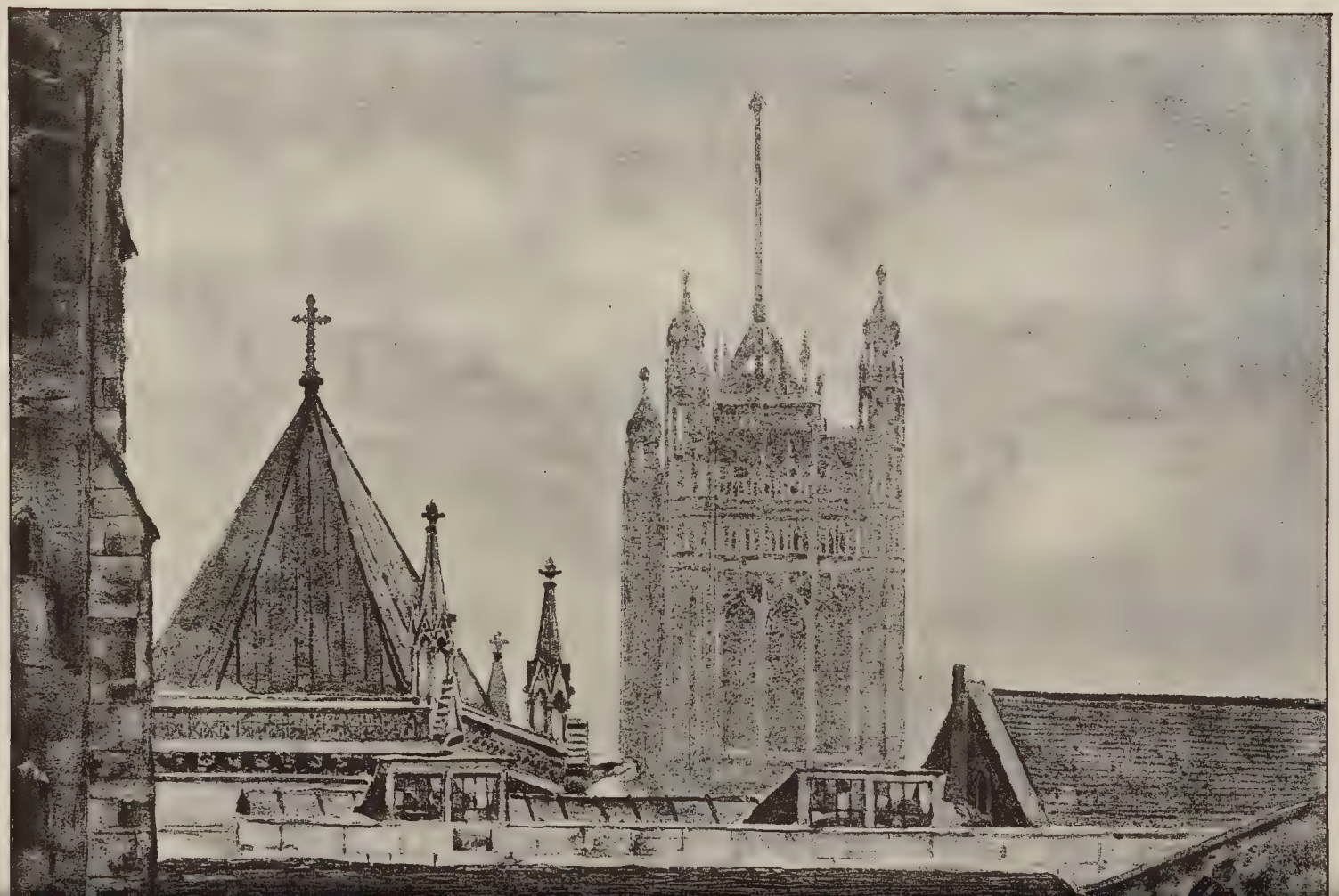


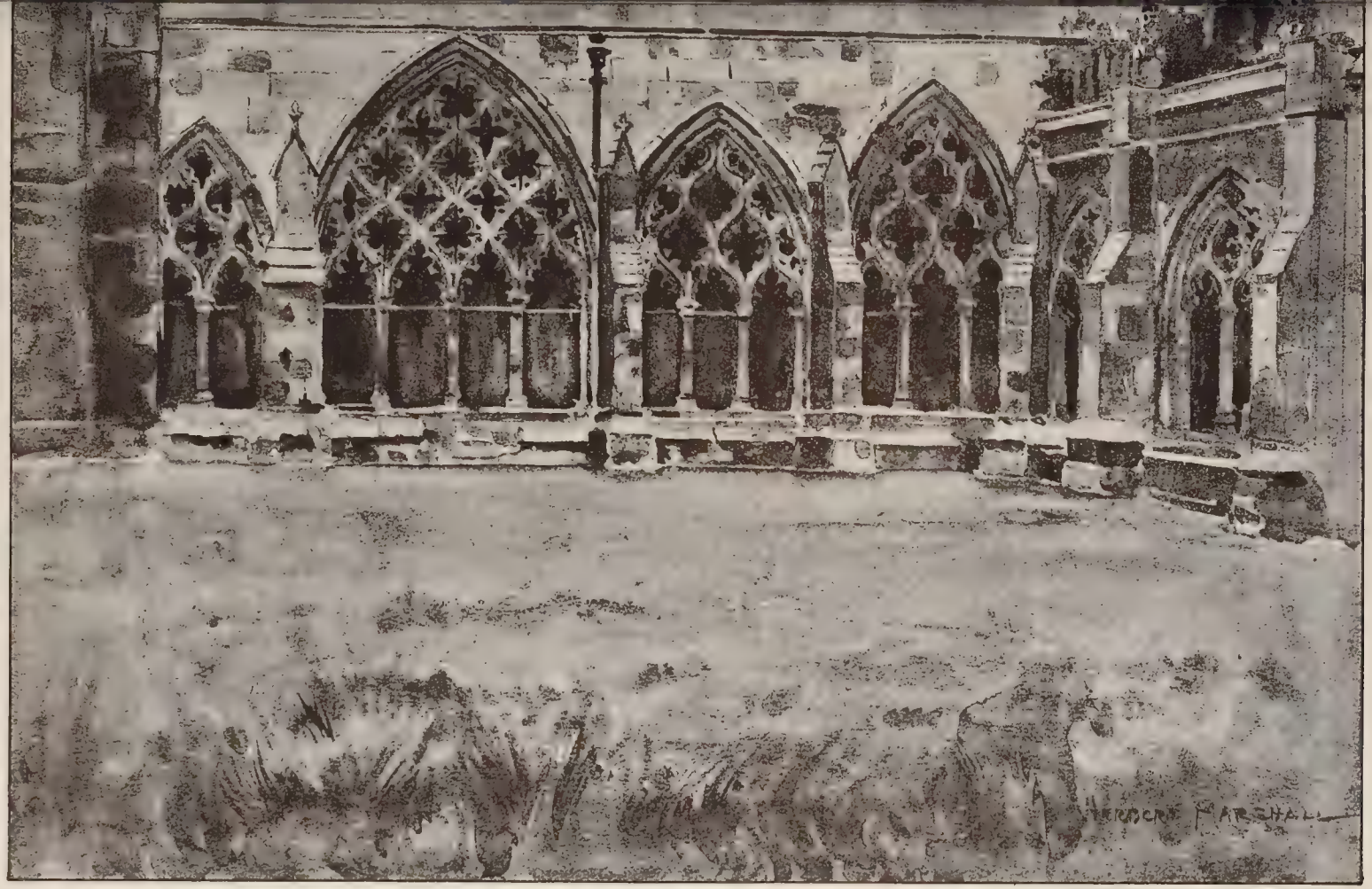
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VIEW IN THE CLOISTERS, WESTMINSTER ABBEY.—Drawn by Mr. Herbert Marshall.



Cathedrals of E

No 1. CANTERBU



nd and Wales.

DRAWN BY THE EDITOR

PLAN OF

EXPLANATIONS.

A Baptistery
B Sub-vaults
C Treasury
D St. Andrew's Chapel
E Henry IV Chantry
F Corona or Becket's Crown
G St. Anselm's Chapel
H St. Michael's Dº
I The Lady or Deans' Dº
J South Porch
K Stairs to Parvise
L Western Entrance

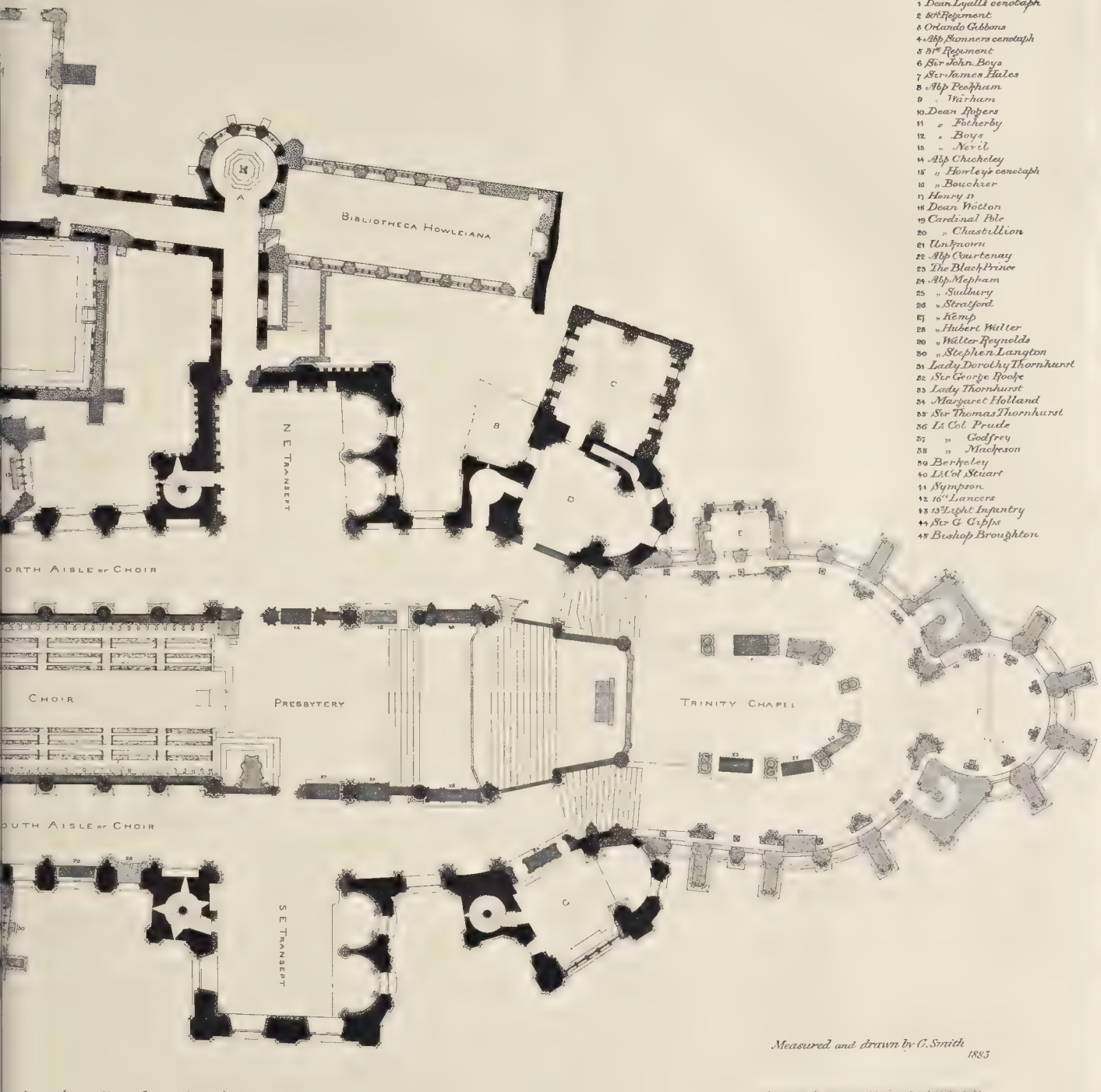
Lanfranc
Norman { not known to be Lanfranc's
Romanesque
William of Sens
English William
13th century
14th dº
15th dº
Post Reformation
Uncertain
Present century



Angles of Orientation

Scale of Feet

ANTERBURY CATHEDRAL.



MONUMENTS.

1 Dean Lyall's cenotaph
2 50th Regiment
3 Orlando Gibbons
4 Abp Sumners cenotaph
5 51st Regiment
6 Sir John Boys
7 Sir James Hales
8 Abp Peckham
9 " Warham
10 Dean Rogers
11 " Fotherby
12 " Boys
13 " Nevil
14 Abp Chicheley
15 " Howley's cenotaph
16 " Bouchier
17 Henry II
18 Dean Wotton
19 Cardinal Pole
20 " Chastillion
21 Unknown
22 Abp Courtenay
23 The Black Prince
24 Abp Meppham
25 " Sudbury
26 " Stratford
27 " Kemp
28 " Hubert Walter
29 " Walter Reynolds
30 " Stephen Langton
31 Lady Dorothy Thornhurst
32 Sir George Rooke
33 Lady Thornhurst
34 Margaret Holland
35 Sir Thomas Thornhurst
36 Lt Col Prude
37 " Godfrey
38 " Mackeson
39 Berkeley
40 Lt Col Stuart
41 Sympson
42 16th Lancers
43 13th Light Infantry
44 Sir G Gipps
45 Bishop Broughton

Measured and drawn by C. Smith
1883

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1890.

The Builder.

Vol. LX. No. 2301. Saturday, Jan. 10, 1891

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Building-Stones of the Lincolnshire Oolite.

THE formation known to geologists as the Lincolnshire Oolite has for ages been celebrated for its building-stone: it is believed to have been worked as far back as Roman times in some districts. At the village of Barnack, for example, a statue of recognised Roman workmanship has been discovered carved out of the well-known "rag;" whilst in the parish church the Saxon, Norman, Early English, and Decorated portions are built of the same material; and certain it is that in Mediæval times it was very extensively worked and carried by water to many parts of Lincolnshire and the fen country. This Oolite was also employed in the erection of some of the finest examples of Elizabethan architecture in the counties of Northampton, Lincoln, and Rutland, and in this connexion is widely known to the profession. But very few of the quarries at present open can satisfactorily trace their origin to these early times. Old workings have been abandoned and new ones have sprung into existence, not far removed it may be from their predecessors, but, still, far enough to result in some slight change in the lithological character or structure of the stone, either for the better or worse. These facts should be borne in mind when examining the present condition of the stone in these ancient buildings, and applying the results to the material as now quarried. The building-stones of the Lincolnshire Oolite as a whole have always been noted for their durability, and this, together with the favourable account of them given in the Report of the Royal Commission in 1839, has largely increased the industry. Even since the appearance of that useful Parliamentary paper, however, certain of the most important quarries now in operation have been opened up, whilst others are either but comparatively little worked, or are altogether closed,—some of the newer stones are not of such good quality as those formerly obtained near the same spots, whilst others exhibit a marked improvement in that respect. The introduction of railways and increased facilities of carriage, with the consequent reduction in prices, have also played their *rôle* in bringing about these changes. It may be well, therefore, to briefly review the principal stones at present sent to the market, and to give some account of the industry.

The Lincolnshire Oolite is best developed in the county from which it derives its name, but it extends northwards into Yorkshire, southwards into north Northamptonshire, and is well represented in Rutland. At Stamford it is about 80 ft. in thickness, and northwards from that town acquires still greater proportions. Its horizontal extent is, however, by no means commensurate with this thickness, for Professor Judd, F.R.S., has shown that it thins away rapidly southwards, eastwards, and northwards. That excellent authority considers it to be the eastern portion of a great lenticular mass of marine limestones intercalated between the Upper and Lower Estuarine series, which beds are respectively found above and below it in most districts. Its geological age, which, as a rule, is wrongly quoted in non-geological works, is referred to the Inferior Oolite period, being on the same horizon as the quarries in Gloucestershire at Painswick Hill, Guiting, Brockhampton, Broadway, Cleeve Cloud in the Cotteswold Hills, &c. We may here pause to allude to a popular error in regard to the words "Inferior Oolite"; we find that in the trade they are generally understood to imply that as a rule the stones comprised within that formation are of inferior quality; but this is by no means the case, and it is to be regretted that such an erroneous construction should be placed on a common geological term, which is merely used to indicate the relative infra-position, stratigraphically, of that stone in the Oolitic series. For example, it is inferior in position to the Great or Bath Oolite—it occurs beneath it stratigraphically.

The Lincolnshire Oolite limestone exhibits many distinct facies, even in short distances, and this, perhaps, forms its most peculiar feature when contrasted with the comparatively regular, homogeneous Bath and Portland beds in the south and west of England. The quarries of any one district in the Great Oolite, for instance, are, as a rule, very similar to each other, the succession of the beds is practically the same in all of them, with but slight variations in thickness; the jointing is tolerably persistent over large areas, and the beds of stone are fairly even, whilst soft or rotten stone and clay galls are not of very frequent occurrence. But the character of the Lincolnshire Oolite is entirely different, and the rules adopted in quarrying the one class of material do not (with rare exceptions) apply to the other, the north country stone being much the more difficult to deal with, as will presently be seen. There are at least four distinct facies comprised within it. The first is characterised by the occurrence of slightly argillaceous limestone in thin hard and soft beds, much cut up by small joints. It is ordinarily sub-crystalline, very slightly Oolitic in structure, and is full of fossils. In a pit at Castle Bytham the rock is seen to be almost wholly made of fossil corals. This bed only furnishes local building-material.

In a second facies we find the strata converted into a fissile limestone, which at Collyweston, Kirby, and near Dene produces roofing-slates. They are, of course, not the usual kind of slates, which are composed of silicate of alumina, thin, and of bluish-purple tints; but are, as might be imagined, of carbonate of lime, thick, and of varying yellow and grey tints. This material, so highly esteemed in the Middle Ages, has continued to be worked down to our own times, though on a much smaller scale than formerly. With increased railway accommodation, and the consequent introduction of the lighter and more economical Welsh slates, the "Collyweston slate" industry rapidly declined. The neutral tint of this Oolitic slate, however, harmonises perfectly with the stone of the same colour and nature used in many old ecclesiastical edifices, and the late Sir Gilbert Scott, amongst others, continued to employ it in more modern churches. A short time ago, when in the district, we were informed that its present use is almost entirely confined to the renovation of old roofs and in supplying local wants. The immense areas occupied by many of these old slate-pits abundantly testify to the great demand for the material originally; their refuse-heaps are quite conspicuous features in the landscape. Although a great portion of the beds surrounding it is fissile, the stratum from whence the true roof-

ing slate comes is comparatively thin, varying from 6 in. to 3 ft. in thickness. It is quarried either in the open or by drifts, which run a long way underground, and the stone is removed by means of picks and wedges. Curiously enough, the slates cannot be cleaved from the blocks of stone until the latter have been frosted. Professor Judd, in speaking of this, says * that they are usually dug during about six or eight weeks in December and January. The blocks are laid out on the grass, preferably in a horizontal position. It is necessary that the quarry-water shall not evaporate before the blocks are frosted, and they are constantly kept watered, if necessary, until as late as March. The weather most favourable to the production of the slates is a rapid succession of sharp frosts and thaws. If the blocks are once allowed to become dry they lose their fissile qualities, and are said to be "stocked." They can be cleaved at any time after being frosted.

A third facies of the Lincolnshire Oolite formation consists of strata very largely made up of broken or comminuted shells, amongst which numerous Oolitic granules are regularly dispersed, which pass by insensible gradations into the fourth kind, which is a true Oolite, made almost entirely of the characteristic spherules. The principal building-stones are raised from the two last-mentioned beds; for brevity, the former kind may be styled the "shelly Oolite," and the latter "true Oolite."

These different kinds of material do not follow one another in a regular order of succession throughout the formation, as in many other stone-producing districts. Locally, a few general rules may be established; but when traced over a large area, the divisions are frequently found to replace each other, the type of rock occurring at the top of the series in one district being found at the bottom of it in another. At first sight, these remarks may appear to have but little economical bearing, except from the quarryman's point of view; but this is not so; it is of considerable importance to the architect also in enabling him to make out his specification properly. We know of cases where stone of a particular horizon has been specified; but, as we see, it is not always possible to describe the building-stone raised at various places in the Lincolnshire Oolite limestone as coming from a particular horizon in it. Where several quarries are worked by one firm, specifications giving "precise horizons," however well entertained at first, are of necessity entirely ignored in practice as the order is being "made up." The following is not a bad way of dealing with such cases. When the quarry-owner indicates that he has three qualities of stone for sale at three different prices, he should be asked to submit a fair average sample of *each*,—not of one kind only,—with prices attached, respectively. One foot cube is a convenient size,—small pieces which can be put into the waistcoat-pocket are of little value for practical purposes. If the architect selects the best quality, with the highest price (depending on the nature of the work for which it is intended), the fact should be very clearly set forth in the specification, and the quarry-owner, after entering into the contract, should be well kept to the bargain throughout. It should not be permissible when the architect has ordered one class of stone from a quarry for the builder to step in and order another kind, under any pretext whatever; to some this remark may appear unnecessary, but we make it advisedly. In the event of a dispute as to the quality of the stone arising between the architect and the quarry-owner, in a large contract the matter might be submitted to an arbitrator, who shall compare the samples submitted in the first instance with the material actually supplied on the works, and be guided in his judgment accordingly. We remember having been once drawn into the vortex of a dispute of this nature, and found that the matter could not be very amicably adjusted, for the simple reason that neither party could agree as to what was originally specified, and there was nothing very definite to appeal to. Where Oolites, like those of Bath and Portland, are regularly jointed and bedded, and each bed has a definite and well-known name of recognised value, the above remarks are not so applicable, neither do they refer to certain quarries in the Lincolnshire Oolite, where, locally, the character of the stone and jointing, as at Ancaster, are more even than is usually the case with that formation.

The principal stone-quarries in the series now under review are at Ancaster, near Sleaford; Ketton, Little Casterton, Clipsham, Barnack, and other places near Stamford, and at Weldon, near Kettering.

The Ancaster quarries are about a mile from the village of the same name, and two from its railway station, where there is a depôt, to which the stone is carted in waggons. Quarries have been worked in the district for centuries, and there is every reason to believe that at some early date water carriage existed from Boston, for many of the churches on the east coast, as far south as Harwich harbour, contain considerable quantities of stone which is quite indistinguishable from that of Ancaster. The lofty tower and spire of Grantham church (thirteenth century), Belvoir Castle, and Belton House, Grantham; and Wollaton Hall, near Nottingham (seventeenth century) are excellent illustrations of its use in olden times, whilst the work recently carried out at St. Alban's Abbey (we will not say "restoration"), Midland Hotel and Station at St. Pancras, restoration of chapel and blocks of new buildings, Lincoln's-Inn; and Hatchett's Hotel, Piccadilly, may be cited as modern examples of its employment. In the Lindley quarries, which may be taken as a typical development of the beds, we found the section as follows:—

	Thickness.
Stiff black clay, elsewhere used for brickmaking	12 ft. to 22 ft.
Rag or "Weather Bed," light brown colour, hard and very compact,—at present very largely raised as building-stone ..	3 ft. to 8 ft.
"Freestone," light cream colour; tools easily. Finest beds near the bottom; mostly used for building purposes	14 ft. to 23 ft.

The measurements given are derived from an examination of the different quarries, which, however, are quite close to each other. They are total thicknesses, each division consisting of several courses separated by joints. It might be taken as a rule that the freestone in the district can be obtained in blocks from 1 ft. 6 in. to nearly 3 ft. in thickness, depending on the quarry, whilst any reasonable length and breadth can be had. We are informed that the labour in tooling is about 5 per cent. higher than that of ordinary Bath Oolite. The stone will be described in greater detail and compared with others later on. The rag or weather bed is very much stronger than the freestone, and matches the old Barnack rag, for which reason it is much used in the restoration of buildings originally constructed with the latter material. It can be obtained in any length and width, and up to 2 ft. in thickness. Certain portions of this stratum, which are light-blue in colour, are occasionally sawn into 2-in. slabs for flooring, for which purpose it is very effective. The bedding of the stones in the quarries is practically horizontal. All are open workings, the blocks being removed by picks, wedges, and bars, and in the Lindley quarries are lifted to the surface by a steam-crane and travellers. Here also there is a steam planing-machine. The stone is sawn both dry and wet. The number of men employed varies considerably with the time of year, but there are about sixty men, mostly on piece-work, in the two sets of quarries in the district.

There are also extensive workings at Haydor, near Ancaster, which produce an excellent stone. It does not differ materially from that already described, and is taken to the railway depôt by a traction-engine. We believe that about twenty men are engaged in the work.

The Ketton quarries, which are about two miles from the station, are also of high antiquity, though the earlier workings were abandoned years ago. The stone has been used in nearly all the large mansions in its immediate neighbourhood—also at St. Dunstan's Church, Fleet-street; Peterborough and Ely Cathedrals, &c. The beds are subject to considerable variability in thickness in the different workings, but the following section (with slight alterations) is given by Professor Judd:—

	Thickness.
Dark Upper Estuarine clays of great thickness, with ironstone nodules at base.	
The "Crash" bed—a coarse, shelly Oolite, of purplish-red colour, of different shades, used for walling and rough building purposes, about.....	3 ft.
Grits and Rag, of light grey tint, highly crystalline in texture, too hard to be dressed, in two beds, about.....	6 ft.
Freestone, of cream colour, true Oolitic structure, bedding planes hardly visible. This is the best building-stone	3 ft. to 3 ft. 6 in.

When the "crash" bed is first dug into, it is very soft; but, on exposure to the atmosphere, acquires extreme hardness. The freestone can be placed indifferently in any position in buildings without exhibiting increased tendency to weathering. The workable bed forms sometimes one, and at other times two, courses. The strata dip slightly. It is a pity that the amount of overburden is so enormous, and, in consequence, the cost of quarrying so great, that the material cannot be more readily obtained; for, as everybody admits, it is unquestionably one of the best and most uniform building-stones in the kingdom. It is not weathered or seasoned at the quarries, and is not difficult to tool, but we were informed that large blocks are not now easily obtained; the Commissioners' Report referred to, however, states that the size of the blocks that can be procured is said to reach 100 ft. No steam-power is at present used in any of the quarries, the stone being moved by ordinary hand-cranes. From fifty to sixty men are, on an average, engaged in the industry; but, in times gone by, as many as 100 men were employed.

In one of the Ketton quarries we saw an ingenious patented contrivance (Turner, No. 685, January 14, 1889), being an improvement in stone-working machinery. It aims at facilitating the more accurate turning of stone balusters, urns, &c., and, briefly, consists in a horizontal bar fixed about 2 ft. above and along the length of the lathe, with sliding and partially revolving "adjusters" attached thereto. The mason, putting the working drawing in position under the horizontal bar, slides the adjusters along it until they are over the more prominent and cut-in portions of the design, and then fastens them. The partially revolving portion of each adjuster (which is weighted and works independently of the part just secured) carries a sliding wire, and this wire is now adjusted to the pattern of the working drawing, and then fixed in the revolver. When this process is finished the mason allows each revolver to turn half round, carrying its wire out of the way, keeping clear of the work, which it does by means of the weights (shots) referred to. Now putting the rough stone in the lathe, he turns it partially into the required shape, but as the work approaches completion he frequently brings the wires down on to the stone until they freely revolve and pass over it. It will be seen that by this method great accuracy of proportion is attainable, for until sufficient of the stone is turned off, the wires of the revolvers will not pass by,—they should just be able to run clear. This invention unquestionably saves a considerable amount of time in turning, and avoids the unsatisfactory process of continually measuring with the rule or otherwise as the work is in progress.

The Weldon stone and quarries have already been described in our columns, but a recent

* "Geology of Rutland," &c. (Mem. Geol. Survey), 1875, pp. 182-3.

visit enables us to make a few additional observations, and a brief *résumé* of the whole will serve to render our present remarks more complete. The Weldon quarries are about a mile and a half from the Weldon and Corby station. Quarries in this district also have been worked since a very remote period, though it is only within the past few years that the present extensive operations have been opened out, and the material sent to all parts of the kingdom. The stone has been used in Kirby Hall (sixteenth century); also in the new University Library, Cambridge; Lincoln and Rochester Cathedrals; the Parish Church, Local Board Hospital, Liberal Club, and other edifices in Kettering; Board School, Rothwell; the Manor House, Brigstock, &c. We measured the following section at No. 2 quarry:—

	Thickness. ft.	in.
Boulder clay	4	0
Irregular fissile stone and sandy beds, known as "Weldon Freestone grit" ...	2	0
Rag and rough, brown-coloured freestone in alternating beds, with a strong course of ragstone at base	18	6
Freestone, shelly, cream-coloured, compact, and laminated. This is the best building-stone in the quarries	7	6

The ragstone, as in other quarries, was used in Mediæval times in the manufacture of marble chimney-pieces, &c.,—an industry now quite extinct. The freestone, which belongs to the "shelly Oolite" facies, is, by comparison with other Lincolnshire Oolite limestones, chiefly remarkable in regard to its thickness, the courses being such that blocks of any practicable size are ordinarily obtained, which, as a rule, are sound and very durable. They are not seasoned before being sent away. The jointing is rather irregular, causing the beds to be lenticularly disposed, which occasions some trouble in working; but this is more than counteracted by the facility with which the freestone can be driven into and mined. The Weldon are the only quarries in the Lincolnshire Oolite in which, so far as we are aware, the stone is obtained by mining, as at Bath, &c., and it is a distinct advantage, relieving the necessity of removing the great quantity of overburden. The rag (18 in. thick) at the base of the rough freestone forms a good ceiling. The beds dip slightly. No steam-power is used except for sawing; about sixty men are constantly employed, mostly on piece-work. The stone is at present carted to the station; but it is hoped that, with the rapidly-increasing business, a railway siding will be constructed,—indeed, a mineral railway along the valley, serving both the iron and stone industries, seems to be very urgently needed.

The Barnack quarries are more interesting historically than for the stone at present raised. We have already alluded to some instances of the use of the material, but we may add Burleigh House, Croyland Abbey, and Boston, Spalding, Holbeach, and Moulton churches. The following may be cited as the typical development in the pits:—

Rubble Oolite.	*Thickness.*
Oolite mainly composed of small shells and scattered spherules, about.....	4 ft.
White, true Oolitic limestone, with sandy beds at base	8 ft.

Professor Judd, speaking of the celebrated Barnack rag of early times, says*:—"Before the Perpendicular period (fifteenth century) the use of the stone appears to have been abandoned, probably from the exhaustion of the quarries. . . . . Several pits in the Lincolnshire Oolite are still worked near Barnack, but in none of them is a rock of exceptionally fine quality found; and the general opinion that the Barnack rag . . . . is now wholly exhausted is probably the correct one." The old quarries in the vicinity are very extensive.

Many openings exist near Stamford, which, in the aggregate, produce a considerable quantity of stone, and in this connexion we may notice the quarries at Little Casterton, where the light brown and grey tinted freestones are of good quality, and readily find their way to the London market, though the workings at present are not on a very large scale. This district is capable of being much more extensively developed.

At Clipsham the freestone is quarried from beneath a considerable thickness of clays. It is a durable material, not unlike the Ketton in appearance, but less even in grain, and with a few shells scattered through its mass.

We may now institute some comparisons between the different stones mentioned, with special reference to their structure and physical properties. We have seen that the stones sent to the market are broadly of three kinds,—viz., Ragstone, Shelly Oolite, and True Oolite.

The "Ragstone" is present in nearly all the quarries mentioned, and is mainly composed of fossil shells of considerable size, with Oolitic spherules scattered between, the whole being cemented together with highly crystalline carbonate of lime. It is either of a blue or light brown tint. According to M. Ébelman,* the blue tint is due to the presence of sulphuret of iron. Sometimes the ragstone is of sufficient importance to warrant its being quarried as an ordinary building-material, as at Ancaster, but in general it is too much cut up by joints and too thin to admit of this. Almost everywhere, however, it can be made into steps and landings. Its great durability is unquestioned, but it yields with difficulty to the hands of the mason.

The "Shelly Oolite," like the ragstone, is mostly composed of shells and scattered Oolitic granules, but the carbonate of lime cementing the whole together and the shells themselves are not so crystalline as in the ragstone, hence it is free and more easily worked. The quality of the stone in the different quarries is largely dependent on the state of crystallisation of the matrices of the shells and granules; and, as a rule, it may be taken that the more highly crystalline the matrix and the shells are, the greater the durability of the material. Moreover, it is usually more laminated than the true Oolites. The Shelly Oolite is characteristic of the Weldon and Barnack districts. Intermediate in structure between the Shelly and True Oolites,—*i.e.*, composed of less shelly matter and a greater proportion of Oolitic spherules,—come the freestones of Ancaster and Clipsham.

The "True Oolite" is a stone almost entirely formed of Oolitic spherules bound together with sub-crystalline carbonate of lime. Such a material may be met with in small quantities in many of the quarries under consideration, but it is best exemplified by the Ketton freestone.

We need hardly point out that as regards grain, the Shelly Oolite is the coarser stone and the True Oolite the finer. For fine carvings and undercuts, and general purposes, the Ketton and Ancaster freestones are very suitable; but for thick, large blocks, ashlar and bold mouldings, the Weldon and Barnack are useful. In regard to the connexion between grain and durability, it is certain that the coarser stones of the Lincolnshire Oolite do not yield to the influences of the weather more rapidly than do the finer; indeed, as far as our observations go, the former are occasionally more lasting than the latter.

The following are the chemical analyses and specific gravities of the principal stones under consideration:—

	Ancaster.	Ketton.	Barnack Mill.	Weldon	
				A bed.	A1 bed.
Carbonate of lime.....	93·59	92·17	93·4	94·54	94·35
Carbonate of magnesia..	2·90	4·10	3·8	2·51	3·55
Iron..... }	0·80	0·90	1·3	0·79	0·61
Alumina... }				0·39	0·28
Silica.....	0·00	0·00	0·0	0·17	0·08
Water, &c....	2·71	2·83	1·5	1·60	1·13
Specific gravity.	2·68	2·70	2·63	2·45	2·42

The strength of the stones has been determined as follows:—

	Crushing weight, 2-in. cubes.
Ketton	... 91 cwt.
Ancaster	... 83 ,,
Barnack	... 65 ,,

	Tons per square foot. Cracked.	Crushed.
Weldon A1 bed ...	... 140·3	164·6
Weldon A bed ...	... 103·6	126·5

It is to be regretted that experiments as to strength or resistance to thrusting stress are not carried out with more method, so as to produce uniform data for comparison. As we have on a previous occasion remarked, a relative result cannot accurately be obtained by multiplying the effects produced on small cubes to make the terms synonymous with the larger foot or 6-in cubes. By that method they are not strictly comparable.

In regard to relative powers of absorption, 100 parts by weight become:—

Weldon A1 bed	... 109¾
,, A ,, ...	... 109

Bulk of water absorbed; total bulk being considered as unity:—

Ancaster	... 0·180
Barnack	... 0·204
Ketton	... 0·244

It is no part of our present purpose to discuss the relative merits of these stone-tests and experiments; but properly understood and studied with the text of our remarks they are of significant meaning. Enough has been said, we think, to show that the building-stones of the Lincolnshire Oolite are both interesting and instructive.

NOTES.

THE preliminary programme for the seventh International Congress on Hygiene and Demography, to be held in London on August 10, is now issued, but is understood not to be by any means final. The Prince of Wales has accepted the office of President, and the long list of the general committee includes a great many names well known in connexion with hygienic subjects: among others Sir Lyon Playfair, Mr. C. T. Ritchie, the President of the Local Government Board, Sir Andrew Clarke, Sir Spencer Wells, Sir James Paget, Professor Corfield, Dr. Richardson, Dr. Orme Dudfield, Dr. Farquharson, Mr. Rogers Field, and Mr. Baldwin Latham. Among the architects included in the list are Mr. Waterhouse, Sir A. Blomfield, Mr. Aston Webb, Mr. Charles Barry, Mr. R. W. Edis, Professor Banister Fletcher, Professor Hayter Lewis, Mr. Saxon Snell, Mr. Keith D. Young, and Mr. Ernest Turner. The sections as at present divided in the prospectus are I. Communicable Diseases; II. Demography and Industrial Hygiene; III. Hygiene of Infancy and Childhood; IV. Hygiene of Houses and Towns; and V. State Hygiene. "Demography" is defined to be "the study of the life conditions of communities from a statistical point of view." The objects of the Congress will be to awaken public interest in the progress of hygiene and demography; to afford persons interested in these subjects the opportunity of meeting with the object of advancing their progress, and by conferences and debates to elucidate questions relating to hygiene, demography, and public health. Among the subjects (as at present proposed) which are of special interest to our readers are, in Section II., diseases caused by various industrial occupations, and methods for their prevention, together with the sanitary requirements as to the hygienic conditions of factories, workshops &c.; and in the same section, the housing of the working classes; effects of the hygienic condition of large cities; degeneration of the physique of town workers. In Section IV. are included the subjects of the laying out of streets, height of buildings, air

* *Op. cit.*, p. 172.

* Bull. Soc. Géol. de France, 2 ser., t. ix., p. 221.

space about houses, density of buildings and of population in their relation to health; the planning, construction, drainage, warming, ventilation and lighting of houses and of public institutions; the supply and cost of water to communities, the treatment and utilisation of sewage, the treatment and disposal of house refuse, road sweepings &c. The proceedings will extend from August 10 to August 17 The occasion will be a very important one for the discussion of many points of vital importance to the inhabitants of such a city as London, and it is to be hoped that some new lights will be struck out from the papers and discussions at the meetings.

THE great strike of railway employés in Scotland still continues, both sides being too sanguine of ultimate success to give in. The traffic is being partially carried on in most districts, as some of the regular servants have resumed work, and are being reinforced by "importations" from this side of the Border. There are still engine-drivers, &c., eager for employment who lost their places through previous strikes, although a large number of the men so discharged found situations in the Colonies. Some of the strikers have, unfortunately, allowed themselves to be led into acts of violence, and serious rioting has resulted. Their behaviour on the whole has been very commendable, but they have lately been receiving some very mischievous advice. The Secretary of the National Dock Labourers' Union is reported to have told them that they could have fought their battle quite as well at work, and would have done better not to have struck at all. He recommended that signalmen should let the signals stand against the trains, that stokers should let the fires go down, and so on; adding that the dockers knew how to play that sort of game, and had tried it on with success. Mr. Tait,—the leader of the men on strike,—in calling upon those who had resumed work to come out again, remarked that the strikers could make the position of their brethren now working very uncomfortable, and he had no hesitation in telling them to do so. The companies naturally desire to prevent their loyal servants and "emergency men" from suffering for their fidelity; and as this would inevitably follow if the strikers should return to work on their own terms, the difficulty is thus aggravated. Attempted eviction of self-discharged men from the companies' cottages has still further increased the friction, and the unfortunate dispute seems a long way off settlement. Were Parliament sitting, efforts would probably be made to invoke State intervention, although it is hardly within the competence of the Legislature to interfere.

WE have received the printed programme for the new and more extended competition for the improvement of artisans' dwellings, to be opened by the French "Société des Habitations à Bon Marché," which was referred to in our Foreign news of last week. In order to keep the enquiry, which is part of the competition, within definite lines, a certain number of questions have been formulated to which competitors are requested to supply the answers. In regard to the first section, Existing Conditions, these questions are grouped under the heads "Généralités sur le mode de logement"; "Maisons habitées par une seule famille"; "Maisons collectives"; "Garnis"; "Conditions hygieniques"; "Intervention administrative"; "Taux de loyers et mode de payement"; "Facultés de transport"; "Consequences de l'état du logement." Full answers to the questions under these heads, for various localities, will furnish a very valuable body of evidence as to the existing conditions of lower class habitations in France. A second part to this section asks for answers in regard to the existing influences for the improvement of such dwellings, and information as to what is done by (1) "Interessés," the occupiers themselves; (2) "Action des patrons"; (3) "Action des Sociétés Philanthropiques"; and (4) "Action de Speculation." Under the second main section, "Projet d'Habitations," it is noted that the competitors are invited to make designs for habitations for special localities, in accordance with local custom and making use of the materials commonly employed in the district; and it is added that great importance will be attached to hygienic conditions, to lighting, ventilation, sufficient cubic space in relation to the number of inhabitants, water supply and drainage. In the general prefatory instructions it is suggested that it would be a great advantage to have local committees constituted to conduct the competition in regard to local circumstances; and in regard to designs for buildings it is specially insisted on that this is not to be an "étude dans l'air ou une dissertation théoretique," but that a special site available for model buildings must be selected and a design made *for that site*. Cottage dwellings, (*maisonnettes*) isolated or grouped, are to be preferred in the neighbourhood of manufactures situated in a country district, collective dwellings for towns. The comprehensive ideal of the scheme is eloquently stated in the following words from the prefatory remarks:—

"Pour utiliser et même susciter tous les bons vouloirs, ce concours ne se borne pas à une localité déterminée, qui n'aurait intéressé qu'un personnel restreint. Française est la Société, français aussi doit être le concours qu'elle institue. Partout où il y a des ouvriers, des paysans, des petits employés, mal logés, et à côté d'eux des hommes de cœur et de talent pour constater ce mal, s'en affliger et en chercher le remède, notre appel peut et doit être entendu. Le temps des solutions est venu: l'opinion publique, autrefois indifférente, les réclame aujourd'hui avec une netteté qui tournerait vite à l'impatience si on les ajournait; enfin notre Société, en donnant son aide et sa publicité aux efforts individuels, en les orientant et en les groupant, peut en hâter et en faciliter le succès. Ces solutions demandent la collaboration des architectes, des hygiénistes, des économistes, des financiers, qui représentent les différents points de vue du problème, mais qui, divers par la spécialité, sont uns par la philanthropie et le but à atteindre."

AT the British Museum the sculpture and architectural details of the small temple or Heröon at Xanthus, discovered by Fellowes, and formerly in the entrance hall, have for some time past been in process of re-arrangement, under Mr. Murray's direction, in the room at the head of the staircase leading down to the Halicarnassian room. The front colonnade has been built up as a restoration on the upper part of the south wall of the room, and the sculptures are arranged in the same room. The small model of the temple is temporarily placed in the room containing the remains of the Temple of Diana at Ephesus. Mr. Murray has brought out one curious fact in putting together the fragments of the pediment of the Xanthus temple. Portions of the statues which formed the acroterion and the terminals at the extremities of the pediment show that these did not stand, as they would be almost inevitably shown in a restoration, on horizontal plinths placed on the slope of the pediment, but the block forming the base of each statue was let about three inches into the upper surface of the pediment, the raking line of which was unbroken, the statues appearing to stand on the slope of the pediment. This is a new fact for architectural restorers of Greek temples. Mr. Murray believes that he has also an idea as to the function and position of the two archaic figures of lions, long familiar objects in the entrance hall of the Museum. No probable place can be found for these on the exterior of the temple, and an examination of the surface of the marble shows that it is in a very different condition from that of the statues which were obviously a portion of the exterior decoration. The marble surface of the lions is comparatively clean, fresh, and uninjured, except where actually broken, and has not the brown weather-stained appearance of the other figures and fragments of figures. Mr. Murray therefore conjectures, with every show of probability, that these figures stood in the interior of the small temple, and were perhaps supporters to a throne or shrine.

IT appears from the recent Parliamentary return that the net revenue of the Post Office is, in round numbers, over three millions, as against a net revenue of between one and two millions in 1872. It is certain, therefore, that the department should establish many more Money-Order and Saving-Banks offices all over the country. The latter are needed to increase habits of thrift among the people, the former that members of a family more especially may be able to assist each other when at a distance. This, in itself, is a species of thrift. It is well-known that in the building and carpentry trade men work in different places at different times of the year, their families residing all the year in one spot. These persons would benefit much by an increase of Money-Order offices. If the means of sending money home are close at hand, cash is saved which otherwise would often go to the public-house. Of course, there are many other ways in which an extension of this department would be beneficial to the whole community, and, therefore, it is to be hoped that the matter will be considered without further delay by the Postmaster-General.

IN reply to the recent memorial addressed to the Marquis of Salisbury on the subject of the preservation of Egyptian monuments, the *Times* prints a letter from the Foreign Office (dated December 25), stating that the memorial presented by Lord Wharncliffe will be forwarded to her Majesty's Agent and Consul-General at Cairo for presentation to the Egyptian Government. The letter continues:—

"Sir E. Baring will be instructed to state that her Majesty's Government consider the question of the nationality of the official to be appointed to such a post to be a matter which lies wholly within the competence of the Egyptian Government, and that their only desire is that adequate steps should be taken to preserve the monuments from further destruction or mutilation."

A NEW postal regulation, under which letters may be forwarded by railway, is announced by the Postmaster-General to come into operation next month. "Railway Letters" will be accepted for conveyance by the next available train, on being tendered at any parcels booking-office, for the sum of 3d. They must not weigh more than 1 oz., and a 1d. stamp must be affixed in the usual way, the remaining 2d. being paid to the railway officer on handing the letter in. The payment will defray the cost of transmission to the station of address, but as the railway companies do not undertake delivery, the letter must either be addressed "till called for," or "to be posted on arrival." In the latter case it would be posted immediately on arrival at the receiving station for the next delivery by postman. The Railway Companies are responsible to the Postmaster-General, and letters transmitted under this arrangement are deemed to be in all respects letters sent by post, and the ordinary conditions and regulations of the Post Office will apply to them. This arrangement will probably be found very convenient in certain emergencies, as, at the present time, no letter can legally be sent by rail. Of course, urgent communications frequently are sent by train, but they are treated by the railway company as "parcels," and the lowest charge—except for short distances—is 6d. It will be noticed that any missive weighing over 1 oz. will still be excluded from the new service, and will either have to be forwarded as a parcel or wait for the next mail.

WE referred the other day to the fall of houses in Bombay, which caused the death of a number of people, and to the apparently unsatisfactory state of building legislation in the Indian cities. We now learn from the Calcutta correspondent of the *Times* (Wednesday) that two Mahommedans

who were apparently responsible for the erection of the building have been arrested on a charge of culpable homicide, and that bail has been refused. This looks as if the local authorities had been at last awakened to the necessity of vigorous action to put a stop to such dishonest and dangerous building.

BARROWBY, in the Grantham Rural Sanitary District, appears to be suffering from the evils not so much of bad drainage as of insanitary water-supply. Dr. Parsons, who has reported to the Local Government Board on the subject, says:—

"There are few water-closets connected with the sewer, most of the houses having privies with deep underground cesspits, which in some cases could be seen to be constructed of dry brickwork, a construction facilitating soakage of foul matters into the subsoil.

The water supply of the village is obtained from wells, said to be about fifty-six in number; each block of property, as a rule, having its own well. . . . Mr. Harrison, well sinker, of Barrowby, tells me that in the wells newly sunk it is the practice to make the upper part of the well, from the top of the clay upwards, watertight, with brickwork set in cement, and a backing of clay; and he thinks that if the wells were always so constructed there would be no difficulty in getting good water. The generality of the wells, however, are not constructed so as to exclude water from superficial sources, being steined in the upper part only with dry stone or brickwork (the top courses only being set in mortar), while below the steining the sides of the well are formed only of the bare rock. In some instances dark stains were seen running down the inside of the well at its upper part. Many of the wells are so situated as to be in danger of contamination by privies, pigstyes, 'crew-yards,' &c."

Recommending that the Rural Sanitary Authority should, as soon as possible, obtain the advice of an engineer as to the best means of providing Barrowby with a sufficient supply of wholesome water, Dr. Parsons appends the following useful note as to the circumstances:—

"I may point out that if a well be found to be polluted with organic matter, merely to clean it out is a very futile proceeding. What is required is so to construct the well as to exclude polluting matter from entering it, and if this cannot be done, the well should be closed. Where the water-bearing bed lies under an impervious bed of clay, the polluted top-soil water should be excluded by making the well water-tight as far down as the clay bed. A way of doing this, which has been successfully adopted in some districts, is to use, for steining the well, large-sized glazed socket-pipes, such as are used for sewers, but set vertically, and with the joints securely caulked. For this purpose, pipes are sometimes made with the flanges inside. The same object may in some districts be attained by the use of Abyssinian tube-wells.

But where there is a general pollution of the water-bearing bed, as would appear from the analyses which have been made to be the case at Barrowby, the only safe course is to obtain a supply from an outside source, free from the risk of contamination."

MR. SPEAR'S report to the Local Government Board on the fatal prevalence of scarlatina in the First (Central) Division of the Neath Rural Sanitary District, gives the following account of the sanitary condition of the most important village in the district, Coedfranc, with a population of about 4,400:—

"The houses near the highway are drained, very often by roughly-constructed channels, which pass frequently beneath the houses to the roadside gutter, where the sewage causes, at various points, considerable nuisance; those in the side streets, or further removed, not possessing even such facilities as the roadside gutter affords, are even more unsatisfactorily circumstanced. Sewage accumulates in pools or ditches about the houses, as at 'The Abbey;' or, as is chiefly the case with the newer property, is discharged into leaking and unventilated cesspools or 'dumb-wells.' One collection of houses near the railway station at Dynevor had, I found, been drained after a certain fashion; the drain in places was partly above the ground-level, it was provided with catch-pits in its course, it was unventilated, and it discharged on to the railway embankment in such a way as to occasion nuisance to the passers-by. Excrement disposal is generally by old-fashioned privy-pits. These often contain an accumulation of twelve months or more; are dilapidated and foul. A very few of the newer houses have been provided with small box-closets, *but no public provision is made for the emptying, and they, too, accordingly, are allowed to overflow, and to become a nuisance.* The removal of ashes and house-refuse is effected by the Authority under a contract."

This is another example of what we have so frequently noted, of the evil effects of leaving such sanitary operations to the will of a poor and ignorant populace.

SOME further demolition is about to be made on the eastern side of Fetter-lane, opposite to the side of the Record Office building. This will involve the removal of No. 24, of which the *Globe* says: "It was a chosen haunt of Charles Dickens in his younger days, and is evidently the original of the 'Old Curiosity Shop.'" This may, perhaps, be the case: but we find no passage in the novel whereby the locality of the house of Little Nell's grandfather can be fixed, either in Fetter-lane or elsewhere. The present tenant, Mrs. Haines, who has received notice to quit this month, has to tell many an anecdote concerning men of letters during the past fifty years or so, and claims to have given its name to *Punch*. The house in question is also the reputed home in the lane of Dryden, in rivalry of that other one, being No. 16, a few yards nearer to Fleet-street, to which we referred in a "Note" on January 29, 1887. No. 16 was distinguished by a tablet inscribed, yet on no certain authority: "Here liv'd John Dryden the poet. Born 1631. Died 1700. Glorious John"; and by its quoins and two lions' heads. It was pulled down shortly afterwards. If No. 24 is of Dryden's day, it has been much altered in appearance since, for it is now coated in front with stucco, and the windows, with their sashes, are modernised.

ST. BENET'S CHURCH, Paul's Wharf, or St. Benet Hythe, in Castle Baynard Ward, narrowly escaped from the fire which did so much damage last week in Upper Thames and Queen Victoria-streets.* It is the one survivor of the four City churches dedicated to St. Benedict; the three others being St. Benet Sherehog, Ward of Cheap; St. Benet Grasschurch, Bridge Ward Within; and St. Benet Finke, Broad-street Ward; and is mentioned in Dean Ralph de Diceto's survey of *circa* 1180. The earlier church that stood on this site has some claim upon our notice, for it contained the grave,—with the monument for which, albeit poor enough and persecuted in his old age, he devised 100*l.*—of Inigo Jones, buried June 26, 1652. The present fabric was built, after Wren's designs, in 1683, at a comparatively large cost of 3,328*l.* 18s. 10d., for the united parishes of St. Peter and St. Benet, Paul's Wharf. It is constructed of red brick with alternated brick and plastered quoins, and has composition festoons and wreaths over the windows; the tower, at the north-western angle, in three stages, has a bold cornice and blocking course, and is surmounted with a ribbed leaden cupola, having rounded openings, an octagon lantern to correspond, and vane; the roof is gabled. The body of the church measures 87 ft. by 60 ft.; the interior is in the Corinthian order, and has an aisle along the north side. The churchyard, to the north, has been thrown into the street. By an Order in Council of July, 1879, this church, formerly a rectory in the gift of the Dean and Chapter of St. Paul's, was made over to a Welsh congregation, and the two parishes were united for ecclesiastical purposes with that of St. Nicholas Cole Abbey. The church of this latter is said to be the first to have been erected and finished by Wren after the Great Fire. St. Nicholas Cole Abbey was restored in 1889, and now serves for the united benefices of St. Nicholas Olave, St. Mary Mounthaunt, St. Mary Somerset (whose tower was spared) in Queenhithe Ward, &c. That St. Benet's stands near to Heralds' College very probably accounts for the circumstance that therein were buried Sir William Neve, Clarenceux, Ashmole's friend; William Oldys, Norroy, in the aisle (1761); John Philipott, Somerset (1645); and J. C. Brooke, Somerset (1794). In the old church Elias Ashmole, afterwards Windsor Herald, was married to his first wife, in 1638, the year of his admission as a solicitor in Chancery.

* "St. Benet's Church, with front, roof, and tower, damaged by fire; rest of building and contents slightly by water, and door broken open."—Captain Shaw's official report.

THE destruction of Hurstbourne Park House by fire is regrettable, as every useless destruction of property must be. But it is a matter of still greater regret that valuable works of art which cannot be replaced should also have been destroyed, as, for example, Kneller's portrait of Sir Isaac Newton. When private works of art become public property, there is among many a feeling of regret; but there can be no doubt that pictures of inestimable value are in daily danger in large country houses. The extraordinary thing is that persons who can afford to keep up these palaces make such contemptible provision against the destruction of their property by fire. It was not very long ago that we called attention in these "Notes" to the unsatisfactory system at present in force in country towns and villages for the prevention of fires. It would be well worth while for the great insurance companies systematically to take up this matter. Meanwhile, every person who owns pictures of national interest should care that they are not rashly exposed to destruction.

SINCE the death of Leech, the artistic staff of *Punch* has suffered no such loss as that it sustains by the death of Charles Keene. He was not the most generally popular artist on *Punch*, for his humour was too serious and fine-pointed for the masses to appreciate, and probably none of that "middle class" who were the special subjects of his pencil understood or cared in the least for his portrayal of themselves. He, in fact, sketched and studied the "middle class" for the edification and amusement of the "upper class," but in no unkind spirit. He never for a moment caricatured, but produced his effect by delicate perception of real character and manner; and though, of course, drawing in black and white is not like painting a finished picture, as far as originality and characteristic expression go one of his drawings was often worth a dozen of average academy pictures. His manner of execution, working a great deal by a kind of line method rather resembling etching, was disliked by some as "scratchy" (as we have heard it termed), but it was his own, and gave an additional individuality to his work. If he was himself the author of the title-sentences to his drawings, he gave ample evidence that he could be witty in words as well as in drawing: some of them have almost passed into proverbs. His work has been highly appreciated by French critics; and in an able article in the *Revue des Deux Mondes* some years ago it was observed that any foreigner who wished to understand the English middle class should study above all things the sketches of Keene.

WE have received from the Council of the Art Union a portfolio of four etchings, "as a specimen of what they are now doing to carry out the objects of the Society." They are "The Cloverfield," etched by Mr. E. Barclay after the picture by T. Barber; "Entrance to Pisa from Leghorn," by Mr. C. O. Murray, after Constable; "House at Hampstead," by Mr. H. R. Robertson, after Constable; and "A Windmill" by Mr. Percy Thomas, after Crome. These are fine and artistic etchings after fine originals, and we heartily congratulate the Art Union on having substituted work of this class for the large and coarse engravings of "popular" pictures against which, we believe, we were the first to protest.

BY the death of Mr. John Marshall, the Royal Academy loses a valuable coadjutor. Mr. Marshall, as is well known, had for many years filled the important office of Professor of Anatomy to the Academy, a post for which he was qualified equally by his accurate knowledge of the subject and his power of clear and logical exposition. His "Rule of Proportion of the Human Figure," a short treatise accompanied by large plates, giving his idea of the control or normal type of the figure, is a standard work.

IN an interesting article entitled "Impressions of Peru" in the current number of *Harper's Magazine*, Mr. Theodore Child gives the following description of the constructive method of architecture in Lima:—

"The cathedral is a very large and curious building of grand proportions, with an imposing façade, approached by a flight of stone steps, and flanked by two towers in the Spanish Jesuit style. . . . . But, like Constantinople and other Eastern towns famed for their picturesqueness, Lima will not bear close examination. The cathedral is built of mud, timber, bamboo-cane, common bricks, sun-dried bricks, and such light material, faced with stucco, all in a bad state of repair. Inside it has a vaulted Gothic roof with mouldings of white plaster; but where the plaster has peeled off you see that the whole roof is a mere light framework of wood, covered in with fine bamboo-canes and twigs laid closely together lengthwise, and strengthened by cross-pieces. On the inside these canes are coated with white plaster and on the outside with brown mud, and this is sufficient; for at Lima it never rains, and the moisture of the winter mists is not sufficient to penetrate through the thin layer of earth that is spread over the flat roofs of the houses. . . . . The church of Santo Domingo has a very lofty tower, likewise of timber, lath, and plaster, painted white to imitate marble, and enriched with tier after tier of lapis-lazuli pillars, composed of stucco painted blue and veined with yellow."

WE have received the prospectus of a proposed great labour exhibition to be held in London this year, under the auspices of the Associated Trades Unions, but to be directly managed by an organising Committee to be elected at a general meeting of the delegates of Trades Unions. The serious part of the Exhibition will consist of workshops in which various trades will be carried on under public inspection, as well as exhibits of such work as cannot be manufactured in the building. The lighter attractions of the Exhibition are to include pictures, historical and geographical museums, musical performances, *fêtes*, and athletic displays. In regard to these we must quote the words of the prospectus:—

"An important feature in the entertainments will be *athletic displays*, which should, and no doubt will, exercise a most beneficial effect upon those whom it is intended this exhibition should principally benefit, viz., the working classes. Physical health goes a very long way towards producing a contented mind, and our toilers would do well to follow in the steps of the ancient Greeks, who divided their subjects of study into music and gymnastics—the one comprising all mental, the other all physical training. The Greeks were the first to develop a science of education distinct from book-learning, and we cannot do better than imitate them. Plato lays great stress on the influence of race and blood. According to his dictum, strong and worthy children are likely to spring from strong and worthy parents; and music and gymnastics develop the emotions of young men during their earlier years—the one to strengthen their character for the contest of life, the other to excite in them varying feelings of enthusiasm or tenderness."

This is really magnificent, and we cannot pretend to add anything to it, except the caution that those who are engaged in outdoor manual labour have less need of athletic exercises, and less physical strength at liberty for them, than those who are engaged in indoor sedentary work. The exhibition thus projected is to remain open for six months, and the projectors are sanguine of obtaining four millions of shilling visitors, basing their calculations on the receipts at such exhibitions as those of 1851 and 1862, and the recent ones at Edinburgh, Liverpool, and Glasgow. We should be very glad to hear they had been so financially successful, but we doubt if they will find their exhibition the same kind of 'draw' as some of those referred to. A more serious mistake is in the ostentatious proclamation that the object of the exhibition is to show to the world the true greatness of the working man. Previous exhibitions, we are told, have ignored the artisan, just as in the theatres, we are told,

"The leading actors alone can approach the footlights. The minor characters have to keep in the background, and a crowd of machinists and scene-shifters, without whom the play could not proceed, remain unseen in the wings and behind the scenes; not even a shadow of satisfaction is given to their modest and legitimate vanity."

This is the old story over again of the organ-blower who claimed to share in the applause given to the player. The common sense of the world has decided otherwise, and in this respect the world is not likely to alter its mind, in spite of the magniloquent declaration of the prospectus that

"By giving the workmen of all trades and of all countries the opportunity of showing what their mighty labours can accomplish, *the attention of careless people will be aroused, ignorant people will be instructed;* and the last doubt and hesitation of public opinion will be swept away by these convincing proofs."

A labour exhibition is in itself an admirable idea, and we should desire every success for it; but the promoters would be far more likely to gain public sympathy and respect if they had announced it without all this absurd display of "bunkum" and big words. Good taste, however, is among the many little things which the British workman, with all his self-satisfaction, has still to learn.

THE BURLINGTON HOUSE LOAN EXHIBITION.

THIS is the twenty-second winter exhibition of "The works of old masters and of deceased masters of the British School" (observe the delicate distinction between "old" and "deceased") which has been held at the rooms of the Royal Academy, and remarkable as has been the vitality and variety of these exhibitions one is led to question whether the time has not come to begin over again. The interest is kept up in one way or another, but year by year the really great pictures become fewer in number, though we have never been without some of the very highest class. Perhaps the twenty-fifth year, now not far off, may be a convenient epoch to accept either for closing the series (*absit omen*) or for endeavouring to work on the minds of owners or their representatives to give a fresh loan. Many of the owners when the loan exhibitions were started are probably now dead, and the present owners would therefore only feel it as a first request. A new generation has sprung up since the loan exhibitions were started, which has little conception of their pristine glory, and of the filling of whole galleries with works of such beauty as are now only to be found by the half-dozen or so, among a number of works of only moderate interest. The scheme was begun, in fact, in too prodigal a manner. Nearly the whole range of galleries was filled with great paintings in the first three or four years' exhibitions. The result was most striking for the time, but this prodigality wasted too soon the riches of the nation in pictures (great as these are), besides presenting more at a time than could be fully studied. If the attempt were made in a year or two to recommence, there is enough material available to keep up high-class exhibitions of old masters for a longer period than a quarter of a century, if only the mistake is not again repeated of being too lavish at first.

Though the "Old Masters" portion of the present exhibition is not one of the most interesting that has been, it contains really great works. The best of these are to be found in the large room, where as usual the south wall forms the main display. Here we find Reynolds's splendid portrait of Miss Kennedy (132), a work which the artist at the time considered "had more grace and dignity than anything he had ever done," and which justifies his satisfaction. The face is a noble one, painted with great delicacy, the attitude dignified, the costume rich and picturesque. Another interesting "Reynolds," though not nearly equal to this, is "Miss Horneck" (134) in Persian dress, seated on the ground facing the spectator: the Oriental attitude being apparently suggested by the Oriental costume. This is a picture of distinct individuality in colour and treatment; but the torso looks much too small for the head. Reynolds's "Young Fortune-tellers" (137), portraits of the children of the fourth Duke of Marlborough, is a charming child picture, but suggests the idea that the painting has been refreshed in parts. Then there is Romney's in every way superb-looking portrait of Lady Milnes (an ancestress of Lord Houghton's), a tall grand-looking woman in a brown silk dress and large hat, her hand placed on the pedestal of a column; the whole air and attitude of the figure form a kind of ideal of aristocratic pride, a little too self-conscious. The same wall contains Turner's two views in Lowther Park, belonging to the Earl of Lonsdale, one of which is rather tame, but the other (131) is a beautiful example of Turner in his more delicate moods: the effect of graduated sunlight on the rounded hill in the middle distance is remarkably beautiful and true.

Among the other paintings in the large room that may be singled out for special mention is the curious and in its way remarkable work by Sodoma, "St. Jerome" (110), a life-size kneeling nude figure of bronze-like colour and painted with mechanical hardness, force, and precision. Gainsborough's fine and spirited portrait of a naval officer, "John Augustus, Lord Hervey" (98), leaning against a gun, is one of the best things in the room, which also contains examples of Claude ("The Trojan Women Setting Fire to the Greek Ships"), Murillo, Velasquez (equestrian portrait of the Duc d'Olivarez) Moroni, and other well-known names, not represented however at their best.

In the first room hangs Etty's "Scene from Comus" (13), so-called; in reality a painting of the golden tree and the Hesperides as described in Comus. This is a remarkably good work in a decorative sense, both in regard to colour and composition. Its defect is the defect of all Etty's works, the total want of elevation of style in his figures; they are always admirable in colour, they seldom escape something like vulgarity in conception and design. De Loutherbourgh's two "Sea Fights by Night" (11 and 14) go to confirm his reputation as a mere scene-painter, and have no business here except on the ground that it is well to let the truth be known about false reputations. Turner's "Wreckers" (21) is an example of his late style, and his "Sheerness" (36) of his earlier style; they are neither of them of his best work, and the boats in the latter are very bad. Two pictures by Landseer, "An Event in the Forest" (34) and "Lost Sheep" (38) are of interest; the latter, where a Highland shepherd with his collies is exhuming some sheep from under deep snow, is an admirable example of Landseer's work. Among other paintings in this room are several landscapes by Crome, one or two of them rather out of his usual style of subject, and Romney's charming portrait of Lady E. Cavendish-Bentinck (10), a bust portrait in a hat and cloak.

The Second Gallery, devoted as usual to Dutch pictures, contains a really remarkable work by Jan van Meer, "The Soldier and Laughing Girl" (52), remarkable for its artistic feeling and powerful effect of light. The soldier sits in shadow in the foreground with his back nearly to the spectator, the woman laughing has the full light on her face; the painting in detail is not very refined, the power of the picture lies in the strong sense of pictorial effect which it displays. There are two or three remarkable works by Frank Hals, of which "Le Joyeux Buveur" (72), a laughing man lifting on high a glass drinking cup, is perhaps the finest. The two portraits of men of a more respectable order (69 and 71) are full of Hals's peculiar *bravura*, which to our thinking is somewhat over-estimated, and there is a trickery about the painting of the beard and moustache (in No. 69 especially), the hairs being painted in separate in a stringy fashion which gives an effect, but is contrary to truth. The De Hooge lent by the Queen (85) is a good example, and the Terburg, "The Letter" (92), also lent by her Majesty, is one of the finest specimens of the painter in regard to execution, though the extreme and defiant ugliness of the woman holding the letter takes away nearly all the enjoyment one would otherwise have in the work. Among the pictures in this room a hard topographical view of "Old London Bridge, 1630" (63), by Claude de Jongh, is of considerable interest in its way.

The collection of early oil paintings, arranged as usual in Gallery IV., includes a good example

of Bernardino Luini, "The Nativity" (140), and an interesting series by the same painter of the "History of the Three Martyrs" (143-4-5). A small Mantegna of the "Virgin and Child" (152) is remarkable for its special colour treatment, the background being filled with cherubic figures of crimson colour. Giovanni Bellini's "Virgin and Child" (155) is a fine work; and a most remarkable and extraordinary painting is that by Andrea del Verrocchio of "St. Michael trampling on Satan" (157). Satan, with bats' wings, rises half-way out of the ground, from a cleft in the rock at the edge of a chasm, the archangel standing on the margin above plants one foot on the shoulder of the fiend to keep him down; to the right stand Job, an old man with long grey hair and beard, rather recalling the conventional figure of Time, and St. Andrew, as witnesses of the scene. The figures are finished with great brilliancy in a stiff archaic manner, and the whole is a remarkable example of the strange conceptions of religious painting in the early days of the Renaissance. In the same gallery also should be noticed Lucas Van Leyden's very remarkable work, after its fashion, representing "Solomon and the Queen of Sheba" (169). The meeting takes place in a hall surrounded with most elaborately-painted and very corrupt Renaissance architectural details, through the door is seen an open court with still more curious architecture in sunlight on the other side, and a woman bathing in a cistern in the middle of the court. The group of Solomon and his attendants is a *tour de force* of brilliant painting of rich dresses of most curious and effective design, and there is something remarkable and impressive in the figure and action of Solomon, independently of his stiffly brocaded drapery. The whole is an exceedingly valuable and curious study of conventional idealism, as it may be called, completely mediæval in feeling, in spite of the Renaissance architecture.

But the strength of the exhibition is this year, as last year, in the water-colour room, which has recently been set apart for special collections. Last year it was the designs of Alfred Stevens, this year it is a collection of works in water-colour, arranged more or less chronologically. We begin in the small "Black and White" room with the works of the early artists with their restricted palettes; Paul Sandby's views at Windsor and in Hyde-park, followed by other names less known to fame. Two drawings by "Michael Angelo Rooker, A.R.A." both entitled "Ruined Abbey, Shropshire" (10 and 11) are excellent examples of architectural drawing. John Robert Cozens is represented by some mild and grey-toned views in Italy, of which the "Convent on the Walls of Naples" (16) has the most character. François Francia's "Lambeth Palace" and "Landscape" (30, 31) are good little works, and Barrow's carefully-executed and realistic view of the "Pool of London" (33) during the great frost of 1789, with the ships piled helplessly on hummocks of ice, has plenty of historical interest, and is a painstaking piece of work in its way. Henry Edridge is represented by some good little drawings, "Wormley Church" and "Rouen Cathedral" especially, and then we come to the real beginner of the English water-colour school, Girtin. His "Tattersall Castle" and "White House, Battersea-reach" (39 and 41) are works of real genius, the latter especially a remarkable example of a fine picture made from the simplest materials, the White House and its reflection standing out as the one spot of light in the picture, which looks like a forecast of Turner. This can hardly be said of the view on the Exe (42), "with rainbow," as the catalogue very unnecessarily adds; a rainbow sticking up from the ground, as solid as if built up with planking and painted. This early portion of the collection ends with a fair selection of drawings by John Varley, who is not, however an advance upon Girtin.

Back to back with Varley, on the other side of the wall, comes John Sell Cotman, one dash of whose rich full colour seems enough to burn up all the Sandbys and Varleys. The drawings exhibited are mostly little more than sketches: but what sketches! what masses of light and dark, blazing skies and inky clouds, and shadowy hills. Even David Cox loses something by coming after Cotman, though there is more of the light and air of common day in his drawings, occasionally somewhat *too* "blottesque." Somehow his large drawing of "Sherwood Forest" suggests Sir John Gilbert, and we almost look to see the foreground filled with steel-capped riders. After David Cox comes Turner, a small collection of drawings, few of them representing his finest work, but differing from all the other sets we have looked at in their remarkable variety of power, the work of a genius of the first order, not tied down to a favourite set of effects. The finest perhaps is a quiet and probably early work, "York" (87), looking along the river, with the towers of the cathedral in the distance. De Wint, who follows, is not represented to great advantage, but at the top of the room is a splendid little collection of William Hunt's works, showing his special powers at their best. There are some exquisite still-life pictures, the beautiful one of the old man seated at table, called "The Blessing" (113), two boys shivering in "A Cold Morning" (112), and perhaps most remarkable of all, though less finished than many of them, "The Cricketer" (108), a boy raising his bat for a regular "slog," with an expression of furious energy in his heated face which is almost sublime.

George Barrett is but a mechanical landscape painter, a maker of pretty pictures, to come after Cotman and Turner. Barrett worked carefully according to his lights, but his neatly-arranged scenes are not things to be enthusiastic over. Nor is Samuel Prout's "Porch of a Cathedral" (125) with its cleverly-indicated details never made out properly, and his little tricks of shadow points in the jointings of the masonry; craftsmanship rather than art. There is a certain power in the loaded view across the sea from a rocky foreground, by "William Turner (of Oxford)," as he is parenthetically labelled to distinguish him from the greater artist whose name he was unfortunate to bear. Havell and Bonington, once names to conjure with, are hardly so now, though they keep their right to a place in the show. Bonington's work is indeed admirable, only it is all alike, the repetition of one idea. These names retire into respectable mediocrity behind those of Samuel Palmer and J. F. Lewis. The latter is best represented by his superb drawing "The Reception" (142) in a harem, a work which is an absolute glow of rich colour (can this really be the same branch of art as was represented by Sandby's monochromatics?), and finished to perfection in every detail. The "Lilium Auratum" (143) would be a highly-finished drawing among the works of most artists, though here it only figures as a study for the picture exhibited a good many years ago at the Academy. Samuel Palmer was a genius restricted in his walk; he had one effect or one class of effect only, but that is a very grand one, and in his fondness for illustrating Virgil and Milton he showed a true perception of his powers, for there is something distinctly epic in the style of his rich landscapes with their golden sunsets; loaded with body colour as they are, they have the effect of great oil paintings reduced to a small scale, as if seen through the small end of a lorgnette. The principal works of his here are the "Lycidas"—

> "Together both, ere the high lands appeared
> Under the opening eyelids of the morn:"

"Tityrus restored to his patrimony," and "The Golden Hour," a small sunset picture which is perhaps the most successful of all.

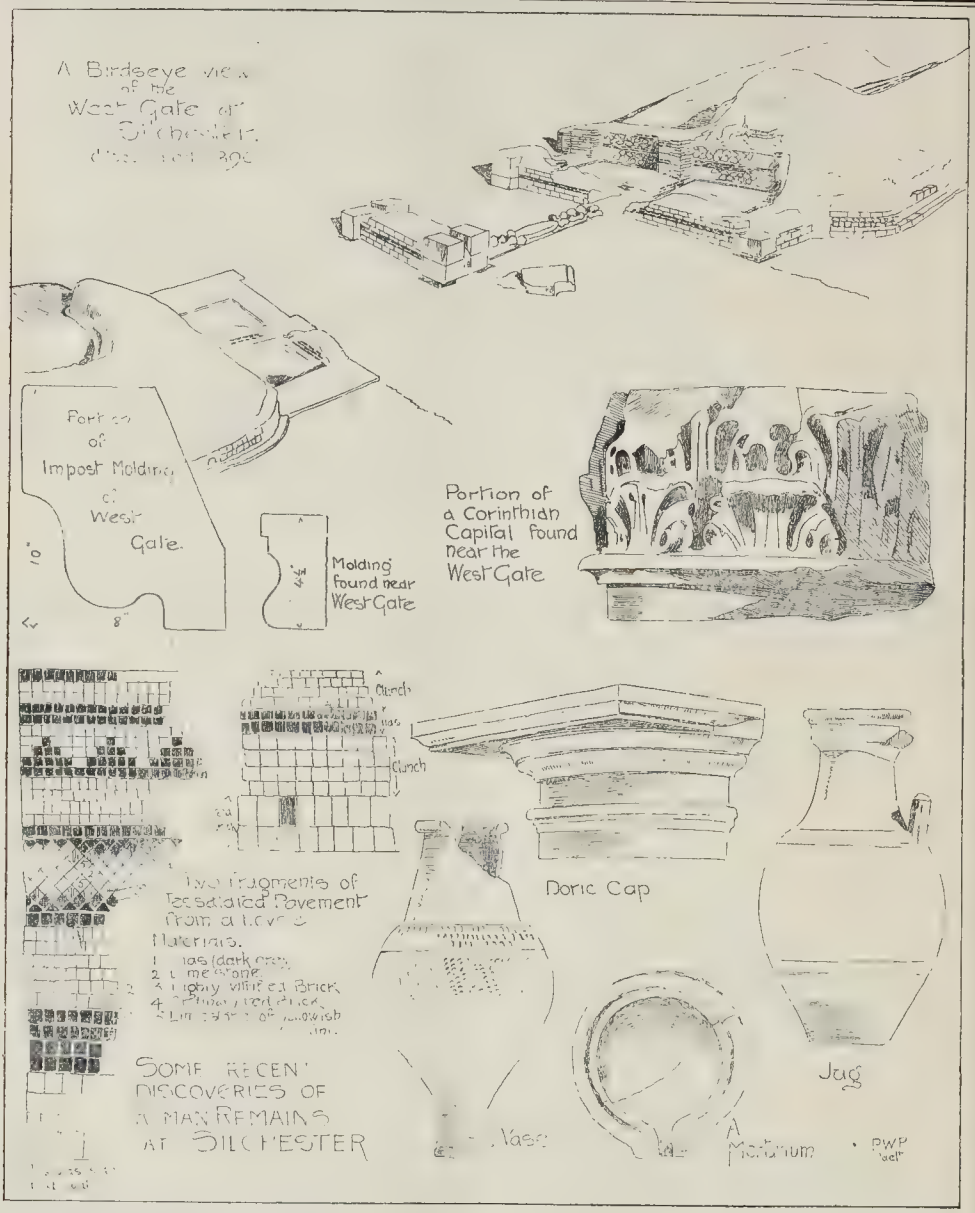
The collections ends worthily with a selection from the beautiful works of Frederick Walker, which no lover of English art can ever see without the keenest regret at the early death of one who was such a master, and would have done far greater things had he lived. As it is, this small collection of drawings is, or should be, the greatest attraction of this year's exhibition. The remarkable thing about Walker is his combination of rich and broad effect of colour with the highest finish and character in the figures. "The Ferry" (158) is one of the most noteworthy in this way; the whole composition is beautiful in its calm effect of soft rich light and colour, while the figure of the girl seated in the stern of the boat, small as it is in dimensions, is a complete study in itself. The little picture entitled "Waiting for Papa" (148), where an overdressed little girl and her fond foolish mother are visiting an orphan school, is a remarkable example of Walker's power of character painting on a small scale; the touching and expressive beauty of the orphan girl first in the rank are pathetically contrasted with the commonplace of the richly-dressed comfortable-looking mother and daughter. In this, as in such works as the "Wanderers," the "Harbour of Refuge" (or, as it is here called, the "Vale of Rest"), Walker showed that he was something more than a painter, even of the best; he was a student of life expressing his feeling on it through painting. Of this highest class of painters there are few indeed, in England at least; and none of those few keep the balance between the artistic and the moral side of painting as completely as Frederick Walker did.

SILCHESTER.

WE are enabled to give, by the kind permission of the Society of Antiquaries, some sketches of the recent discoveries of Romano-British work on the site of the ancient city of Calleva Attrebatum, now called Silchester, in Hampshire, situated three or more miles from the Mortimer Station of the Reading and Basingstoke branch of the Great Western Railway.

The site is a large extent of arable land of about a hundred acres, in the form of an irregular octagon, enclosed by a Roman wall 10 ft. in thickness and in places nearly 20 ft. in height. "It is of the usual construction of Roman city walls in this country, except that the tile courses, so prominent a feature in the walls of Roman camps and towns, are here supplied by lines of flat stones, and that the intermediate courses are laid here and there in herring-bone fashion." Of the four principal gates the north and south were partly excavated by the late Rev. J. G. Joyce in 1872. The west gate has now been unearthed, and a model to ½ in. scale made of it, and from this the bird's-eye view which we give has been taken. As will be seen by the drawing, the bases of the piers which supported the double arches remain very perfect, and the walling, composed in some places of alternate double layers of flint and brick, in others of stone and brick, is in places some considerable height. The foundations of the guard-room are also shown, and a section of a portion of the moulded impost, of brown sandstone, which was found just below its original position at a short distance in front of the central pier. The stone shows on one side (that facing the spectator in the view) a portion cut away to receive the gate itself. Here also was found a portion of a large Corinthian capital (which is also given), with some boldly-treated acanthus. The foundations of the gate itself were of flints, without cement, but probably well rammed, and the footings of the piers themselves were of brick, and show slightly in the sketch. The view also gives some idea of the nature and construction of the outer wall adjoining the gate, and the Celtic earthern mound with which it is backed on the inner face.

Coming now to the discoveries made on the site of the city itself within the walls, among the principal buildings found by the late Rev. J. G. Joyce were two large houses in the north-west quarter of the city. The *insula* on which the larger of them was situated has now been further excavated, and another house of even larger size than the other has been found. Of this, by the kindness of Mr. G. E. Fox and Mr. St. John Hope, we are enabled to give a plan. As will be seen, the arrangement, no doubt adapted to the climate of the country, was entirely different from that in general use in Pompeii and Southern Europe. The general idea seems to have been to arrange the rooms round corridors, the *atrium* and peristyle, as in Pompeian examples, not appearing at all. There were three hypocausts in the house under notice, and considerable remains of the tesselated pavement were also found; of portions of two we give two sketches. The larger one was found at the spot marked A on the accompanying plan, and forms part of a border which perhaps enclosed a pattern with figures or animals. The material used was clunch (or a fine limestone), lias of a very dark grey colour, ordinary brick, vitrified brick, and a yellowish tinted limestone. The clunch and lias were the most common, but in the central portion of the border a very clever arrangement of the materials produced a graduated effect, from the white of the clunch in the central row of tesseræ to the deep grey (which, when moistened or waxed, became almost black) of the two outer rows. The tesseræ were of two sizes, 1 in. and ½ in. square, the larger size being used for the outer rows of tesseræ against the walls. We give also one or two examples of pottery found. The vase has some delicate ornament, made by a modelling-



tool, apparently, and giving it a good deal of character. The *mortarium* shown has had the grains of quartz, which were embedded in the bottom to assist in grinding up the food, entirely worn away, and was probably thrown away as useless.

We may here quote from the Report of the Executive Committee of the Society of Antiquaries:—

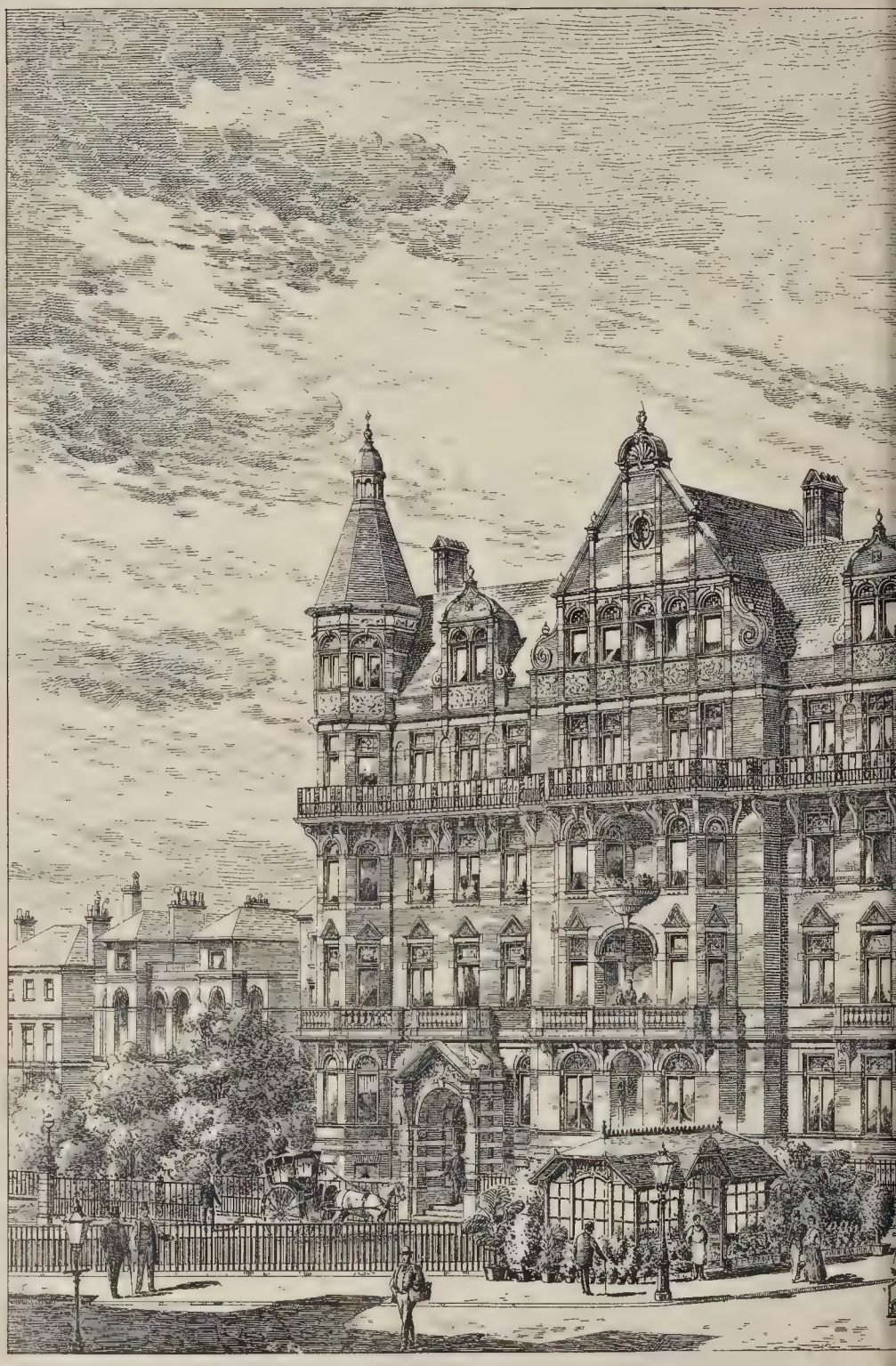
"The systematic and regular trenching of the area north of the highway, and between it and the houses, brought to light several interesting facts.

One is that the ground between and south of both houses was entirely free from buildings, and in part was perhaps used as gardens.

South of the houses the trenches disclosed a whole series of refuse-pits. These were all cleared out, and found to be of no great depth. Their contents were carefully examined and consisted chiefly of dry rubbish, with potsherds, bones, &c., and occasional coins, objects of bronze, and fragments of glass vessels. A similar variety of objects was also found in the trenches."

A very large Doric column is also shown, which was found at the south gate. It did not belong to the gate, but was brought, perhaps for sale, from some large building in the city. The original is exhibited in the Society's hall, and a cast of it, with the broken parts restored, forms part of the Exhibition. Its imposing size and character show the importance of the building of which it formed part; the site of this has yet to be discovered.

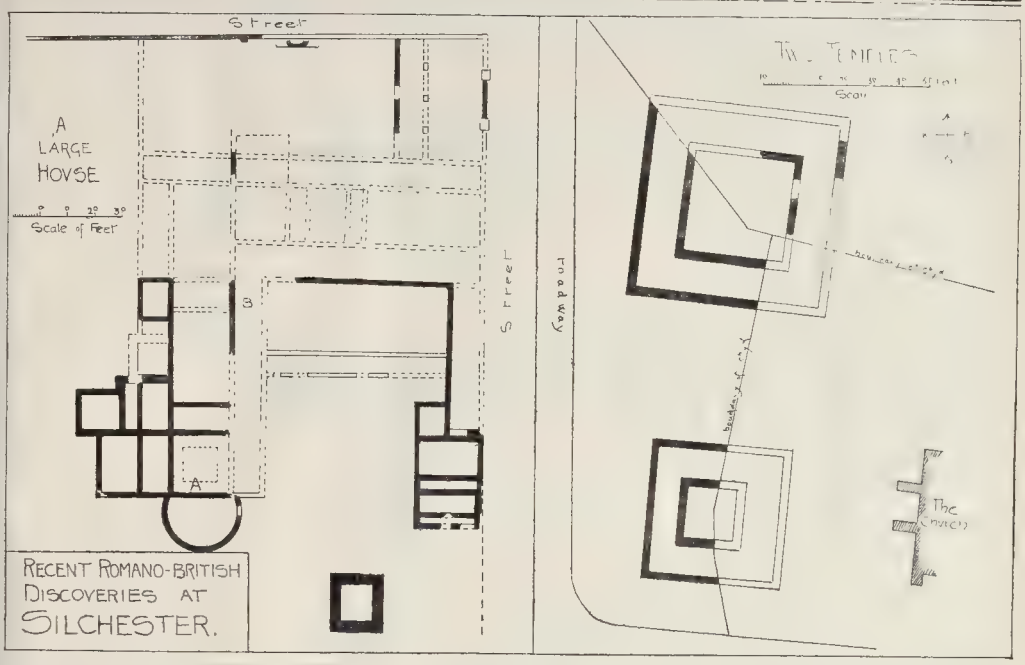
Besides the house, two temples were also found (of which we also give plans) on the eastern side of the site, and close to the parish church, which stands just within the boundary of the city walls. It is somewhat remarkable that the lines of the church are parallel with those of the temples, and not with those of the road, and it seems probable that the church was built on the site of a Roman temple, and perhaps some of the original work was used in its construction. The portions of walls black show the extent of the foundations of the temples which have been followed up to the boundary wall of the churchyard. Amongst the many objects of interest now on view in the Society's room are two specimens of *opus signinum*. One, composed of bits of brick and pink concrete, formed a portion of the platform on which the temple stood. The other, of finer texture, composed of fragments of Purbeck, brick, &c., ground down to a smooth level surface, formed the floor of the building itself. Some of the Purbeck marble wall-linings and the red painted wall-plaster, which was used on the *exterior*, have also been found, and can be seen in one of the cases. There are also a large number of tools, some of them remarkable for their good state of preservation, and also a gridiron, tongs, &c. Various pieces of pottery, Samian ware, ordinary black ware, and Mortaria are also in the collection. Very careful plans and diagrams have been placed on the walls, including a large plan of the whole site.



MAIDA VALE MANSIONS.—M



OEHMER & GIBBS, ARCHITECTS.



It is proposed to continue these interesting excavations as soon as possible in the present year, so that in a short time we shall probably obtain a very complete idea of the arrangement of a Romano-British city; one, it must be borne in mind, where the life was purely civil, and wherein the military occupation of Britain had no place. As nothing is known of the civil life during the Roman occupation of this country, the value of the results of the excavations is of the utmost importance.

We would remind those who should be interested in these matters, and they will surely be many, that the present exhibition at the Society of Antiquaries will not remain open beyond the middle of next week. This is now a good opportunity for obtaining a good general idea of the site, and hereafter it will be easy to follow the very interesting work as it proceeds.

ARCHITECTURAL SOCIETIES.

MANCHESTER ARCHITECTURAL ASSOCIATION.—The fifth ordinary meeting of this Association for the present session was held at the Athenæum on Tuesday, Mr. T. Chadwick, A.R.I.B.A., President, in the chair. Mr. P. E. Barker, A.R.I.B.A., read a paper on "A Sketching Tour through Belgium," illustrated by views with the oxy-hydrogen lantern. A vote of thanks, proposed by Mr. Davies Colley, seconded by Mr. Hewitt, and supported by Messrs. Oldham Hodgson & Davies, concluded the meeting.

LIVERPOOL ARCHITECTURAL SOCIETY.—At the fourth ordinary meeting of the present session, to be held at the Royal Institution, Colquitt-street, on Monday next, a paper entitled "Slates and Slating" will be read by the President (Mr. T. Mellard Reade, F.R.I.B.A., F.G.S.).

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE, AND ART.—At the next meeting of this Institute for the present session, to be held on the 15th inst., a lecture on "Some Architectural and other Notes on Portugal and Spain," will be read by Mr. Campbell Douglas, F.R.I.B.A., Glasgow. The lecture will be illustrated by lime-light views.

PARTNERSHIP DISSOLVED.—We are asked to mention that the partnership between Mr. Arnold Mitchell and Mr. Alfred M. Butler, of 16, Finsbury-circus, has been dissolved by mutual consent. The practice of both members of the firm will be carried on independently at the same address as heretofore.

COMPETITIONS.

PROPOSED EXTENSION OF BARTON UNION WORKHOUSE.—At the meeting of the Barton Board of Guardians, held on the 31st ult. at the Union Workhouse, Green-lane, Patricroft, the Clerk reported the negotiations of the Workhouse Extension Committee with the Local Government Board, with regard to the proposed extension of the workhouse, and the provision of an infectious hospital. Some time ago the Guardians purchased the old mill premises and adjoining property of Messrs. Waddington, in Union-street, which is adjacent to the existing workhouse, at a cost of about 3,500*l.*, of which action the Local Government Board strongly approved. The Workhouse Extension Committee had recently had an interview with Mr. Henley, Poor-law Inspector to the Local Government Board, and other officers of that body. As a result, designs of the proposed extension and new hospital were invited, and it was agreed to make awards to the best three submitted, viz., 1st, 60*l.*; 2nd, 40*l.*; and 3rd, 20*l.* The Committee recommended the adoption of the design marked "Good Administration," which had been awarded first premium. The two other successful designs were marked "Red Cross" (second), and "Union" (third). The Chairman now announced that the architects for the respective designs were—"Good Administration," Messrs. Mangnall & Littlewoods, Manchester; "Red Cross," Messrs. Booth & Chadwick, Manchester; "Union," Messrs. Barker & Ellis, Manchester. The recommendation of the committee was adopted on the motion of Mr. Robinson, seconded by Mr. Berry. According to the *Manchester Examiner*, the adopted design is similar to that of the Burton-on-Trent Union Workhouse, the block system, in accordance with the regulations of the Local Government Board, having been adopted. In reply to a question, the Clerk said the award of 60*l.* to the successful competitor would now be given on account of the architect's commission. The details of the scheme will now be fully gone into by the Guardians, and application will be made to the Local Government Board for borrowing powers to proceed with the work in due course. The accepted design is practically a new building, and will cost to carry out 25,000*l.* to 30,000*l.*

HEAP-BRIDGE CHURCH (NEAR HEYWOOD, LANCASHIRE).—The designs for this church submitted in a limited competition by Mr. John Lowe, architect, Manchester, have been selected by the committee, involving an outlay of about 2,000*l.* The building will be commenced forthwith.

WESTMINSTER ABBEY.

SIR,—The "Blue-book' on Westminster Abbey is of very great interest, but after a careful study of the published plans and evidence the impression produced on my mind is that the scale of the various schemes proposed, and their cost, is out of all proportion to the present need of any addition, while there is a certain space still available for interments and memorials.

Besides, the plans do not appear to illustrate the principle of *growth*, which gives so great a charm and interest to mediæval buildings. In them, contiguity to the high altar being aimed at, the monuments gradually spread from it as the centre outwards, as the more honourable positions became filled up.

Then, again, excepting Mr. Pearson's design for the northern addition, the plans show various forms of halls or chambers, great and small, to which the title "chapel" is given; and a "special service" is, we learn, to be occasionally held in them to carry out the chapel idea, the Burial Service itself being in the Abbey.

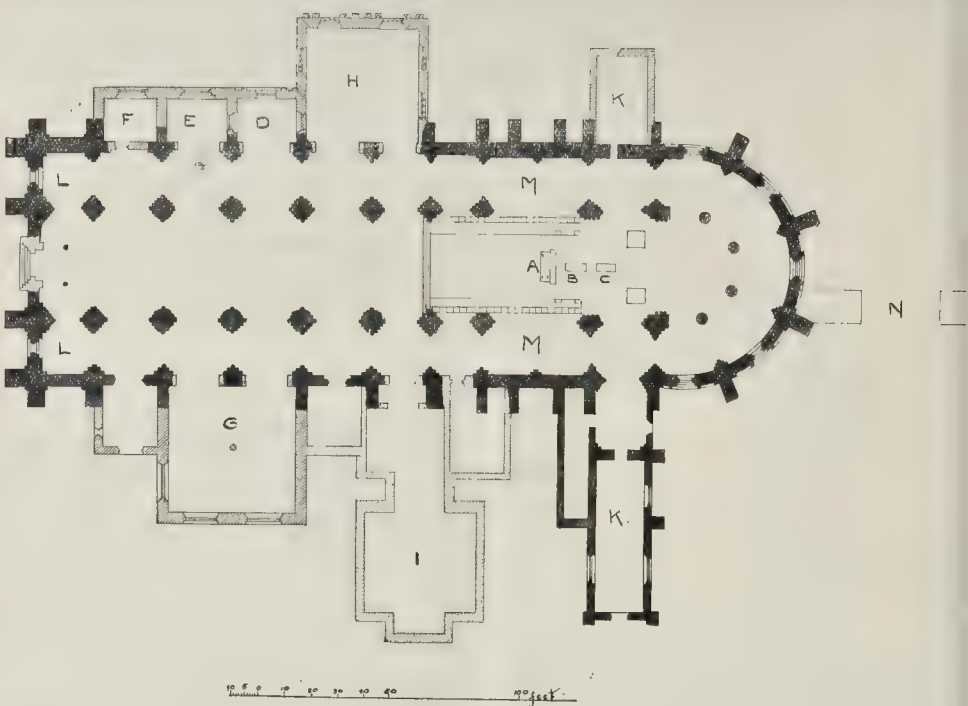
But it is the practical *separation* of these buildings from the church itself which creates this necessity of the special services. It is true that this separation is explained away by the authors as not being an actual one; yet, whatever is done will have to satisfy, not experts or artists only, but general public sentiment. And when the public, more or less ignorant of technicalities, sees two buildings connected by a cloister,—as, for instance, the choir and Lady-chapel of Ely formerly was,—no amount of argument will make them appear, in their view, *one*.

It is this *oneness* of the Abbey which is all-important, and additions manifestly an absolute part of it seem to me to be alone allowable.

The Cathedral of Roëskilde (see plan), the royal burying-place of Denmark, is an example of this oneness, with its many and various additions, not always chapels, some of them being of post-Reformation date, without altars. All of them form one unmistakable whole, and, with the exception of the most modern one, are actually part and parcel of the church.

I venture, to suggest, therefore, an alternative to the north aisle plan prepared by the architect to the Abbey, as shown by the sketch. It is proposed to be on a comparatively small scale, but yet of sufficiently dignified proportions for the purpose.

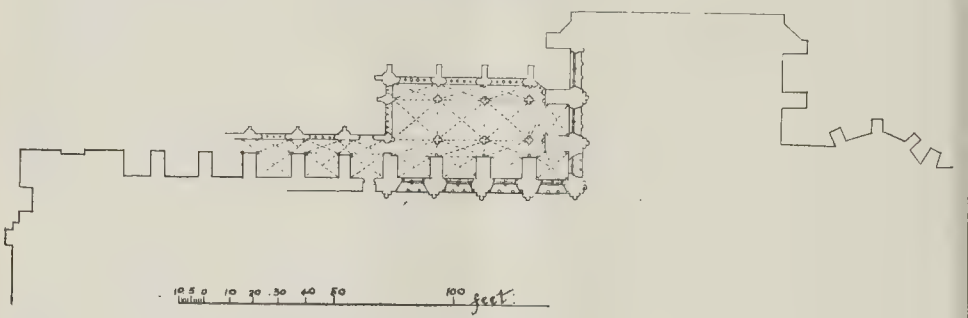
A chapel in the re-entering angle of transept and nave,—or choir,—is so common a



Denotes church of the twelfth and thirteenth centuries.
Denotes additions of the fourteenth and fifteenth centuries.
Denotes additions of the sixteenth century.
Denotes modern additions.

A. High Altar.
B. Queen Margaret's Tomb.
C. King Valdemar's Tomb.
D. Chapel of S. Lawrence.
E. Chapel of S. Brigitta.
F. Chapel of St. Mary Magdalene.
G. Chapel of King Christian I.
H. Chapel of King Christian IV.
I. Royal Chapel.
K K. Sacristies.
L L. Towers.
M M. Transepts.
N. Arched passage to Palace.

Plan of Cathedral of Roëskilde.



Suggestion for Addition to Westminster Abbey: By Mr. R. H. Carpenter.

eature of Mediæval cathedrals,—for instance, Canterbury, Rochester, and Chichester,—that there is ample precedent for an addition there at Westminster in the same or another style, and we cannot but agree that in the instances given there is a distinct gain to the architectural effect of the church without interference with its original proportions.

Of course, there is the great difficulty about a representative style for our day. Mediæval additions with us, and at Roëskilde, together with those there of the sixteenth, seventeenth, and eighteenth centuries, all tell their story to us The question is how this difficulty can be best met, and whether it is so insuperable a one that it is better to do nothing at all.

Personally, I would rather see a building of he Decorated style, in the essentially English evelopmen's of it in Kent or at Ely. The astern cloister openings of Westminster itself prove that the former will harmonise with the work of Henry III., while no one could call Alan de Walsingham's work an incongruous addition to the Norman and Early English structure.

This style, moreover, lends itself to the large windows necessary for lighting monuments, while its delicacy of proportion would contrast, as it does at Ely, with the massiveness of the other without injury to either.

In such an addition, no altar nor title of "Chapel" is necessary to impress the fact of its being a part of the building, while the, to my mind, admirable suggestion of the *Builder*, of the opening of the windows through—and, perhaps, some of the wall arcade also—will sufficiently connect it with the interior.

The style has this advantage, too, that the roof-pitch, as in the Ely Lady Chapel, can be kept low, so that the triforium parapet and pinnacles of the aisle would be visible above it and dignity of proportion obtained without unnecessary height.

But after reviewing the whole subject may we not fairly assume that posterity will scarcely thank us for altering so materially the effect of the Abbey by adding to it for their benefit a large building in a style with which they may have no sympathy? If anything must be done at once, why not be content with providing for the probable wants of our own generation?

R. HERBERT CARPENTER, F S.A.

BUSINESS CHANGE.—Mr. John Chatterton, of Bridge Wharf, Caledonian-road, announces that he has disposed of his business as a lead merchant and manufacturer, to his brother, Mr. Geo. J. Chatterton, who will carry on the business at the same address.





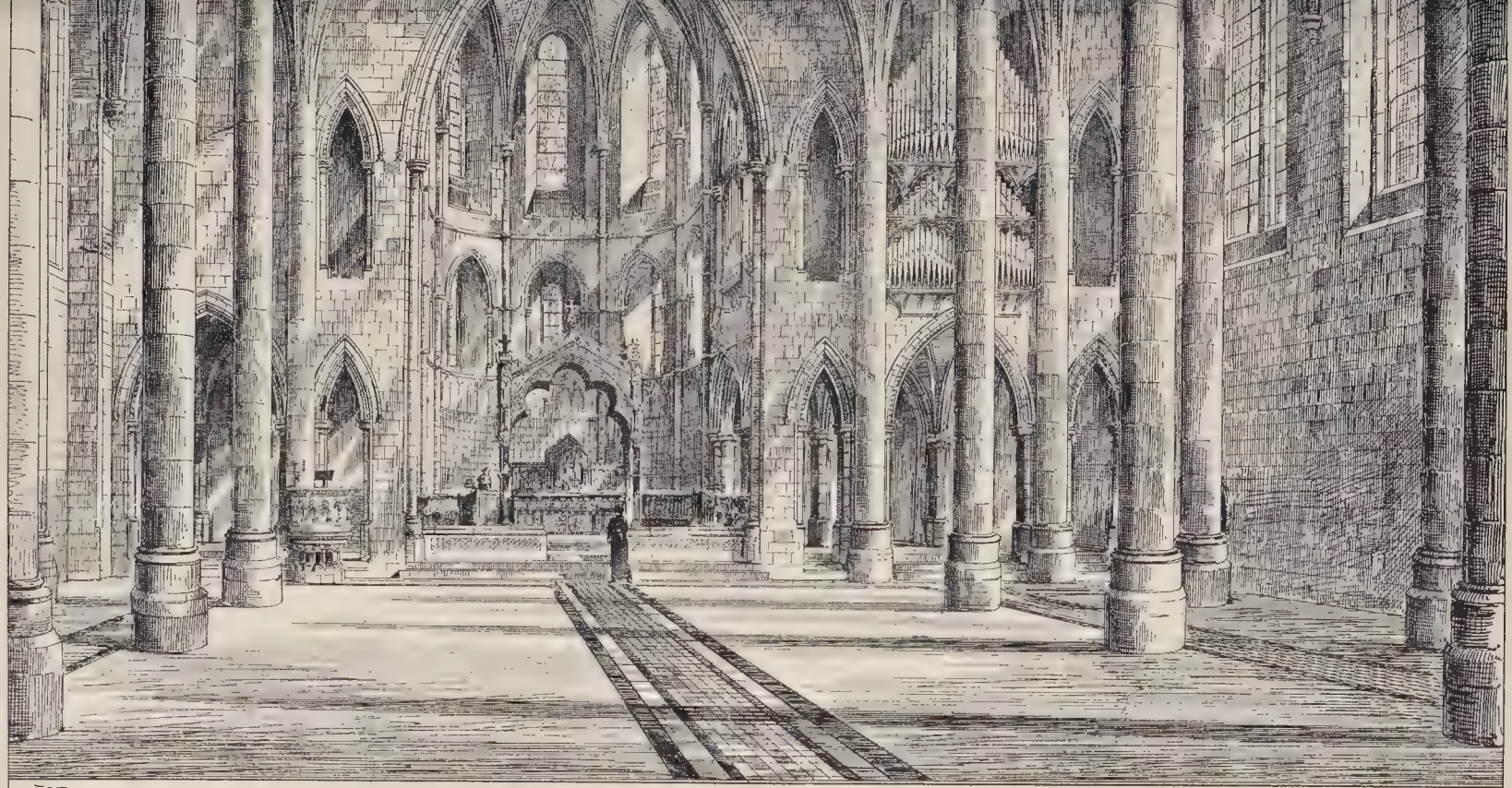
SKETCHES FROM THE CHOIR STALL





S.—By Mr Arnold Mitchell, A.R.I.B.A.





Proposed Ch· of the Good Shepherd· Nampstead· James Brooks. Archt. 35 Wellington St. Strand. W.c

Illustrations.

PROPOSED CHURCH OF THE GOOD SHEPHERD, HAMPSTEAD.

THIS church is about to be erected at Hampstead, near the Gospel Oak Station. The accommodation is for 1,600 people, all on the ground floor. The materials are red brick with stone bands and strings; the interior is to be of stone ashlar. The church is to be groined throughout in stone, the groins springing from the shafts, as shown, without caps. The estimated cost is 16,000*l.* The architect is Mr. James Brooks.

DETAILS FROM THE CHOIR STALLS, AMIENS CATHEDRAL.

THE sketches of detail from these stalls were drawn actual size, and have only been slightly reduced in the reproduction.

As an example of the carver's art the work is unsurpassed both for beauty and spirit of design, and in delicacy of execution. All the old Biblical stories are illustrated with a power and imagination which is astonishing. The sculptures afford endless material for the student's sketch book.

The work is late fifteenth or early sixteenth century, and was executed under the superintendence of one man, Jhan Thrufin, with the help of seven or eight assistants, taking fourteen years' continuous labour to complete.

A. M.

DESIGN FOR THEATRE DECORATION.

THIS is a design by Mr. J. Parlby for the decoration, in Louis Quinze style, for a theatre of a size to seat about 2,000 persons, having three balconies in the form of elongated ovals, and eighteen private boxes. The ceiling is an irregular hexagon in shape.

MAIDA-VALE MANSIONS.

THIS block of flats is now being erected on the Paddington estate, at the corner of Maida-vale and Blomfield-road. The building is separated into two distinct blocks, one of which will have its entrance from the carriage approach in Maida-vale, and the other from the entrance porch in Blomfield-road, which will be considerably widened by a strip of ground to be given up for the purpose.

On every floor there will be four flats, two in each block, containing from six to nine rooms each, which have been grouped, as far as practicable, into three separate departments for living rooms, bedrooms, and kitchens, with their minor offices; four tradesmen's lifts will be supplied to serve the kitchens of each flat.

The staircases are of ample width, the stairs formed of iron and concrete, and finished in marble. The floors throughout will be fireproof.

The elevations are being carried out in red bricks, with stout string-courses and dressings; the roof to be covered with slate. The contractor for the works is Mr. T. L. Green, of Eagle-street, Holborn, and the architects are Messrs. Boehmer & Gibbs.

THE ENGLISH IRON TRADE IN 1890.

JUST as 1889 surpassed the favourable anticipations formed as to the prosperity of the iron trade when that year was entered, so the year of which we have just seen the last has disappointed the hopes entertained at its commencement. Opening in the full flow of prosperity, with prices high and orders plentiful, 1890 closed with depression in almost all branches of the iron trade. The year cannot be described by a better term than phenomenal, as it has been one of the most eventful since the period of 1871-72. While the fall in the price of pig-iron, for instance, has been equal to a reduction of about 30 per cent., labour connected with its production has succeeded in obtaining advances ranging from 30 to 40 per cent. during the past twelve months. The causes of this abnormal condition are not far to seek. The complete organisation with which labour movements are now conducted explains the success of the workmen. On the other hand, there were many influences at work which could not but tend to bring prices down. Amongst these may be mentioned the disturbed condition of two countries of South America, Brazil and the Argentine Republic, closing them against us for a time; the further development of the protective policy of the United States by the passing of the McKinley Tariff Bill; and the great financial troubles in the City in November. All these events have tended, directly or indirectly, to retard business, and to check that inflow of orders which a growing consumption would lead us to anticipate. At the same time the trade done during the year, taken as a whole, has not been far below that of 1889.

We need but refer to that standard of British trade, the Board of Trade Returns, in order to justify this assertion. The foreign shipments of iron and steel during last year amounted to 4,001,579 tons, compared with 4,186,182 tons in 1889. While the exports of 1890 show a decline of 185,000 tons, it is satisfactory to find that the value of those shipments exhibited a gain of nearly 2,500,000*l.*, being 29,142,129*l.* for 1889, against 31,582,172*l.* in 1890. This clearly demonstrates that better prices were obtained in the latter than in the former year, although it must be admitted that much of the increased value shown in 1890 was the result of the high prices at which materials were contracted for at the end of 1889, and that the rates which ruled at the beginning of 1890 have been greatly reduced during the year.

Glasgow pig-iron warrants opened the year at 64s., but by the end of January they had lost as much as 7s. 6d. a ton. Scotch iron continued to droop until it was 43s. 4d. in June,—the lowest price of the year,—when it ascended again to 54s. in October. The subsequent financial disturbances, however, unsettled the market, and caused the depression to which we have referred, notwithstanding the fact that stocks in Connal's stores at Glasgow decreased steadily during the year, standing at 613,445 tons on December 31, 1890, against 1,035,840 tons on December 31, 1889. This is a very remarkable fact. Equally so is the circumstance in connexion with the Scotch pig-iron trade, that, although nearly all the Scotch blast-furnaces have been closed for the last three months owing to a wages dispute with the furnacemen, this has not had the least effect on the resuscitation of prices, which have given way almost the whole time. But they were at the close of the year not so low as at Midsummer, the last cash quotation of the year for Scotch warrants being 46s. 3d. This shows a decline of 18s. over the year. Cleveland pig-iron No. 3 began the year at 65s. It descended to 40s. in June, reascended to 50s. in October, and is now 42s., or 23s. less than in January last. In that case there has been only a small reduction in stocks, the stocks at the end of 1890 being 256,262 tons, against 262,385 tons at the close of 1889. While stocks in warrant stores showed a considerable decline, this was counterbalanced by an equally large increase in the stocks held by Cleveland makers. The production of Cleveland pig last year was 2,846,089 tons, compared with 2,771,181 tons in 1889, and 2,614,983 tons in 1888. Owing to the strike of the blast-furnacemen, the output of pig-iron in Scotland has been but 798,333 tons, the lowest production for thirty years. Although the stocks of hematite iron in the north-west of England decreased by close upon 170,000 tons, and makers have been doing a steady trade throughout the year, prices shared in the general depreciation. Hematite warrants were quoted 82s. 10½d. and mixed numbers of Bessemer iron 82s. in the middle of January, but by June the latter had dropped to 50s. 6d., and are now 53s. 6d; the fall for the year amounting to 29s. per ton. In the other pig-iron making districts the decrease in prices has been as considerable. In Lancashire, the drop has been from 72s. 6d. (the lowest-priced brand) to 50s., or 22s. 6d. per ton; Lincolnshire forge, from 74s. to 47s., or 37s.; Derbyshire foundry, from 78s. to 50s., or 28s. In all those districts the output was very regularly maintained until the general depression caused a withholding of orders, which almost led to a general scramble for them.

It is but natural to expect that the prevailing depression of prices of crude iron was followed by a corresponding decline in the values of the finished product, and this notwithstanding the fact that, as a rule, and for the better part of the year, the output and shipments have not decreased to a degree which would justify the low prices now ruling. In Scotland, bar iron fell from 8*l.* to 6*l.* 10s. In the north of England, common bars and ship plates receded from 8*l.* to 5*l.* 17s. 6d. In Lancashire, makers were able to obtain 8*l.* 10s. to 8*l.* 12s. 6d. for bars in January, but were glad to secure orders in December at 6*l.* 5s. and 6*l.* 7s. 6d. Welsh bars have dropped from 8*l.* 7s. 6d. to 6*l.* 7s. 6d. Marked bars were sold in January in Staffordshire at 9*l.* 10s., but they are now pretty firm at 8*l.* 10s., while the prices of black sheets (angles) were 10*l.* 5s. and 7*l.* 10s. respectively, the great drop in this class of manufactured iron being in a large degree due to the inability on the part of the Sheet Makers' Association of maintaining official quotations in a falling market. In the hardware trade, although employment has been pretty regular, and wages have been higher, operations have been frequently interrupted by disputes to which both sides contributed their share, with the result that the men have been able to greatly strengthen their position. Tinplate makers, both masters and men, have been doing well during the year, which has been a prosperous one to them, and prices closed the year at a higher level than they occupied at its beginning. American buyers at one time tried to depress the market; but, pending the passage of the McKinley Tariff Bill, they had to purchase, *nolens volens*, to be provided against all emergencies, and the consequence was the placing of large orders ahead, which will keep the tinplate makers employed for some time. Prices of plates are now from 1s. 6d. to 2s. 6d. per box higher than they were last January.

It is not too much to say that, although the reduction in prices of steel has been considerable, the trade done by steelmakers during 1890 cannot be much below that of the previous year. There has never been, to our knowledge, absolute want of work, and in some departments, notably the special branches of steel manufacture in Sheffield and Leeds, mills and forges have been carrying on operations to their fullest capacity. In the north-west of England there has been no interruption to the prevailing activity. The consumption of steel has been large both in Scotland and the north of England, more particularly by shipbuilders. There have been considerable fluctuations in steel in Lancashire, both as to demand and prices. Boiler-making qualities of steel plates sold in Lancashire last January at the inflated price of £12; they can now be bought at 8*l.* and under! The difference in price at the beginning and close of the year in other districts was not quite so glaring; still, it was considerable. Steel ship plates, for instance, receded from 8*l.* 15s. to 6*l.* 10s. in the north-west, from 10*l.* to 7*l.* 2s. 6d. in Scotland, and from 9*l.* to 7*l.* in the north of England. There was also a heavy drop in rails, heavy sections declining from 7*l.* 10s. to 4*l.* 17s. 6d. in the north-west, and from 7*l.* to 4*l.* 17s. 6d. in the north. Tinplate bars, a very important article of manufacture, have not suffered so much, the respective prices being 7*l.* 10s. and 6*l.* Notwithstanding this drawback with regard to rates, however, it cannot be denied that the demand for steel is growing, and that steelmakers, to meet the increased inquiry, will have to add to their plant.

The year's shipbuilding returns are satisfactory. Although there is a decrease compared with 1889, the tonnage launched in 1890 being 1,302,055, against 1,346,516 tons in the previous year, this is but a slight diminution in the output in face of the large totals. The tonnage launched in 1890 is the second largest within ten years, and is nearly three times that of the year of lowest production within that period, namely, 1886, when only 474,000 tons were put into the water. The tonnage still in hand is considerably less than at the close of 1889, being about 700,000 tons, while the tonnage building in January last represented nearly 900,000. Engineers can look back upon 1890 with even more satisfaction than shipbuilders, or, indeed, any other department of the iron trade. They have been busy throughout the past year, and commence the new year well off for orders, the busiest branches of the trade being those making machine tools and electrical appliances.

With the exception of the strike of shipjoiners in the north-eastern ports, which was most unreasonably prolonged by sheer obstinacy on the part of the operatives, the year has been singularly free from trade disputes in the shipbuilding line. There have been strikes in other departments of the iron trade, but they partook merely of a local character, and did not cause any unsettlement of the trade at large. The engineers in the north-eastern ports also came out for a time. On the whole, however, the relations of capital and labour have been amicable, and much of this satisfactory con-

dition of things is due to a desire on both sides to avoid strikes. The men really have very little cause for disputes, for wages are now as high as they can possibly be, although an early re-adjustment of the rate of payment appears to be inevitable if present low prices continue to rule.

With regard to the prospects of the iron trade in the present year, views differ somewhat. While the outlook at the close of 1890 was slightly disappointing, and contrary to what was expected but six months ago, there is no cause for apprehension. It must always be borne in mind that the requirements of consumers of iron and steel are not decreasing, and that, all the world over, they must be on the increase with the growth of population and the advancement of civilisation. The checks which strikes and financial speculation and subsequent disaster occasionally put upon legitimate trading are, after all, but temporary. The wants of civilised humanity must be met, with the inevitable consequence of an ever growing production. As to the year before us, it is necessary to observe that, as far as human foresight can determine, there is nothing to disturb peace, and, with peace preserved, trade will revive under the silent but potent influences which have been referred to.

THE RIGHTS AND LIABILITIES OF ADJOINING OWNERS WITH REGARD TO HIGHWAYS.

THE SURVEYORS' INSTITUTION.

AT the ordinary general meeting of the Surveyors' Institution, held on Monday evening last, Mr. R. C. Driver, President, in the chair, Mr. L. P. Hodge, Fellow, read a paper on the above-named subject. He said:—

The history of our roads is one of evolution. In mediæval England the insecurity of life and property prevented even the free communication between town and town which characterised the golden age of Elizabeth. But no sooner did the country realise that the Wars of the Roses had rid it, by a process of exhaustion, both of the feudal system and the grinding tyranny of the old nobility, than a change at once took place. Towns and hamlets, hitherto isolated, became alive to the importance of free and rapid intercommunication, labour ceased to be serfdom, and the immigration to the cities, which still figures as a puzzling factor in our national economy, then commenced.

It would naturally be expected that the improvement of the then existing and newly-formed roads would proceed *pari passu* with the increased desire to travel, and so it happened to some extent. The mere tracks across country, in following which it was literally, as well as figuratively, possible to "lose one's way," became permanently defined. In process of time pillions and pack-horses were superseded by stage wagons, and eventually by coaches, necessitating a wider draught; but beyond the extension of width nothing seems to have been attempted to improve the road surfaces.

The highways ran, we are told, straight up hill and down dale, with the most profound contempt for gradients. In bad weather there was generally a slight ridge in the centre between two channels of deep mud. What wonder, then, that it was considered a dangerous feat for the flying coach to leave Oxford at six in the morning and reach London at seven o'clock the same evening? A winter journey from Chester, York, or Exeter to the metropolis took six days, and even as late as 1790 the cotton bales of Manchester were carried to Bristol on pack-horses. Nor was the population of the country sufficiently spread over its surface to insure a good demand for properly-constructed roads. The revolution of 1688 found more than half England consisting of moorland, forest, and fen, while vast commons and wastes covered the greater part north of the Humber.

But the tranquillity which attended the Protestant succession, and the numerous Enclosure Acts passed in the reigns of George the II. and III., soon effected vast changes in the face of the country.

Scotland, too, shared in the general improvement, though from somewhat different causes. Upon the collapse of the Chevalier's last effort, in 1745, to regain the throne of his ancestors, the Government became alive to the importance of good roads as agents in the pacification and development of the Highlands, and the highways constructed by them for strategic purposes drew from one fervent admirer (possibly of Hibernian extraction) the warm encomium:—

"If you'd seen these roads *before they were made*,
You'd hold up your hands and bless General Wade,"

he being the officer in command of the troops charged with the execution of the work.

It is, however, to the formation of the Turnpike Trusts that we owe more than anything else the vast improvements which have taken place in our roads during comparatively late years.

I have dealt somewhat fully with the gradual evolution of roads, as it materially assists to explain the *rationale* of the various common law rights and liabilities which we now propose to pass on to consider.

In the case of an ancient highway formed, as most roads were originally, through an unenclosed country, the lord of the manor would contribute the soil, which, subject to the use by the public of the surface, would still vest in him. In process of time, the lord's copyholders would commence to enclose land against each other, and against the road. If the lord granted them the land up to the roadway, it would make no difference whether they enclosed to the full extent of their grant, or left a certain amount of waste comprised in their grant outside their fence, and adjoining the roadway. Such waste would be the copyholders' property.

If the lord did *not* grant the land up to the roadway, but reserved a strip of land adjoining the latter, such waste, as well as the roadway, would be his property.

This common law axiom would apply only to roads made through an unenclosed country.

Now, passing on to consider roads formed in an enclosed country, the *copyholders* would, in this case, contribute the land which would remain vested in them, likewise subject to the public rights as in the first instance.

These operations are supposed to have taken place in the remote past, in fact, before the time of legal memory, which is an exceptionally good one, and can be trusted as far back as the reign of Richard II., where a lay mind would be hopelessly unreliable, and it is upon the assumptions just laid down that the common law as it affects owners of land contiguous to highways, is based.

In the absence of evidence to the contrary it is assumed that the land upon which any highway has been formed belongs to the adjoining owners, and that each contributed the use of his ground *usque ad medium filum viæ*.

Land not being then of much value, and the part of the highway actually used being of a fluctuating width, according to the seasons, the owners would generally, in enclosing against the road, set back their fence to leave more than the minimum width, and the surplusage, or "waste," as it is technically called, would be still deemed their property.

The existence of these wastes is, however, more fully accounted for by Lord Chief Justice Tenterden, whose explanation of them I will quote at length:—

"In remote and ancient times, when roads were frequently made through unenclosed lands, and they were not formed with that exactness which the exigencies of society now require, it was part of the law that the public, where the road was out of repair, might pass along the land by the side of the road.

"This right on the part of the public was attended with this consequence, that although the parishioners were bound to the repair of the road, yet, if an owner excluded the public from using the adjoining land, he cast upon himself the onus of repairing the road. If the same person was the owner of the land on both sides, and enclosed both sides, he was bound to repair the whole of the road; if he enclosed on one side only, the other being left open, he was bound to repair to the middle of the road; and where there was an ancient enclosure on one side, and the owner of lands enclosed on the other, he was bound to repair the whole. Hence it followed, as a natural consequence, that when a person enclosed his land from the road, he did not make his fence close to the road, but left an open space at the side of the road to be used by the public when occasion required. This appears to be the most natural and satisfactory mode of explaining the frequency of wastes left at the sides of roads; the object was to leave a sufficiency of land by the side of a road when it was out of repair."

It would seem, therefore, that if any owner encloses against the actual roadway and neglects to keep it in repair, it would be lawful for any travellers to trespass on his property, provided that they travel not into it further than is necessary in the exercise of their right.

This permission would, however, only apply in the case of public roads.

The right to use a private road is strictly an easement, and the person using it ought himself to do the necessary repairs, so as to impose no greater burden upon the grantor than that contemplated at the time of the grant.

Beside, a private right of way is generally restricted to a particular line of road, with fixed ingress and egress, and the grantee would have no right to diverge therefrom, nor to leave it at any point not specified in his grant.

There are three exceptions to the common law obligation to repair *ratione clausulæ*:—

1. That where the enclosure is made by virtue of an Enclosure Act the adjoining owner is not liable to repair, unless in pursuance of such Act.

2. That in the case of building roads and others of modern construction, where only the portion actually formed would be presumed to be dedicated, the adjoining owner may build up to the roadway so formed without incurring any liability save that imposed by statute; and

3. Following from this, that where enclosed land has not been used as a public highway before enclosure the public rights are limited to the extent of the roadway so enclosed.

Any owner can rid himself of the liability to repair *ratione clausulæ*, by throwing open his land to the highway as before, but it may be worth while to point out that by so doing he would not evade his obligation to contribute towards the widening or diversion of the road under the powers of the Public Health or various Highway Acts.

The common law obligations and rights are based, as I have endeavoured to show, only upon presumption, which may be rebutted by evidence that the grantee *did* enclose to the full extent of his grant, in which case the rights and duties of the adjoining owner would vest in the lord of the manor, as first stated.

In the absence of direct evidence the lord must prove acts of ownership in support of his contention, which need not necessarily be exercised over the precise spot in dispute, provided that the places between which such acts can be proved are parts of the same common or waste.

I have been somewhat particular in setting out the principles which govern the ownership of the soil and waste land adjoining highways, as from the number of queries which are constantly appearing in the professional journals, and this Institution's own "Professional Notes," it would seem that the historical theory upon which the common law with regard to highways is based, is not always clearly understood.

In all cases where the public claim a common law right, it must be remembered that the width of road over which it is claimed must always be somewhat undefined, as the public rights extend only over the ground actually used, and are limited solely to the surface.

The soil of the road, with the mines and minerals, and the waste land and trees at the sides, remain, as we have seen, the property of the adjoining owners *usque ad medium filum viæ*, and if from any cause, such as a diversion, the public ceases to use the highway, the adjoining owner can resume absolute possession of the same.

If any proof be needed that the subsoil of a road remains absolutely private property, and that the surface belongs also to the owner of the land upon which the road has been made, it will only be necessary to refer for a moment to the ruling in "Regina *v.* Pratt," where it was held:—

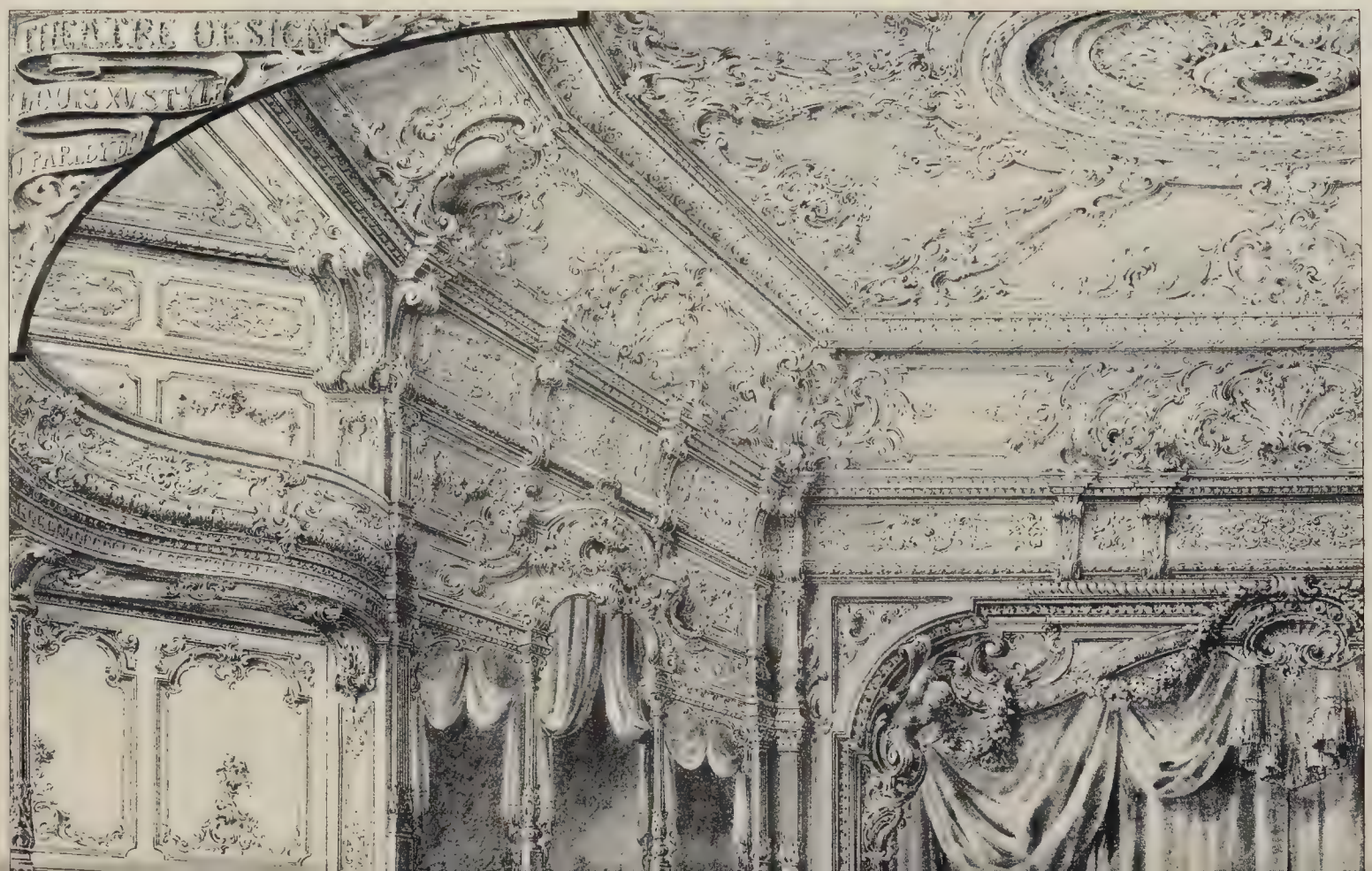
"That if a person stand on a highway (the land on both sides of which belongs to B), and by sending a dog into a cover adjoining puts up a pheasant, which he shoots as it flies across the road, he is guilty of trespassing upon the land of B (*viz., the highway*) in pursuit of game, because he is there not merely in the exercise of his right to travel upon it, but for another and a different purpose."

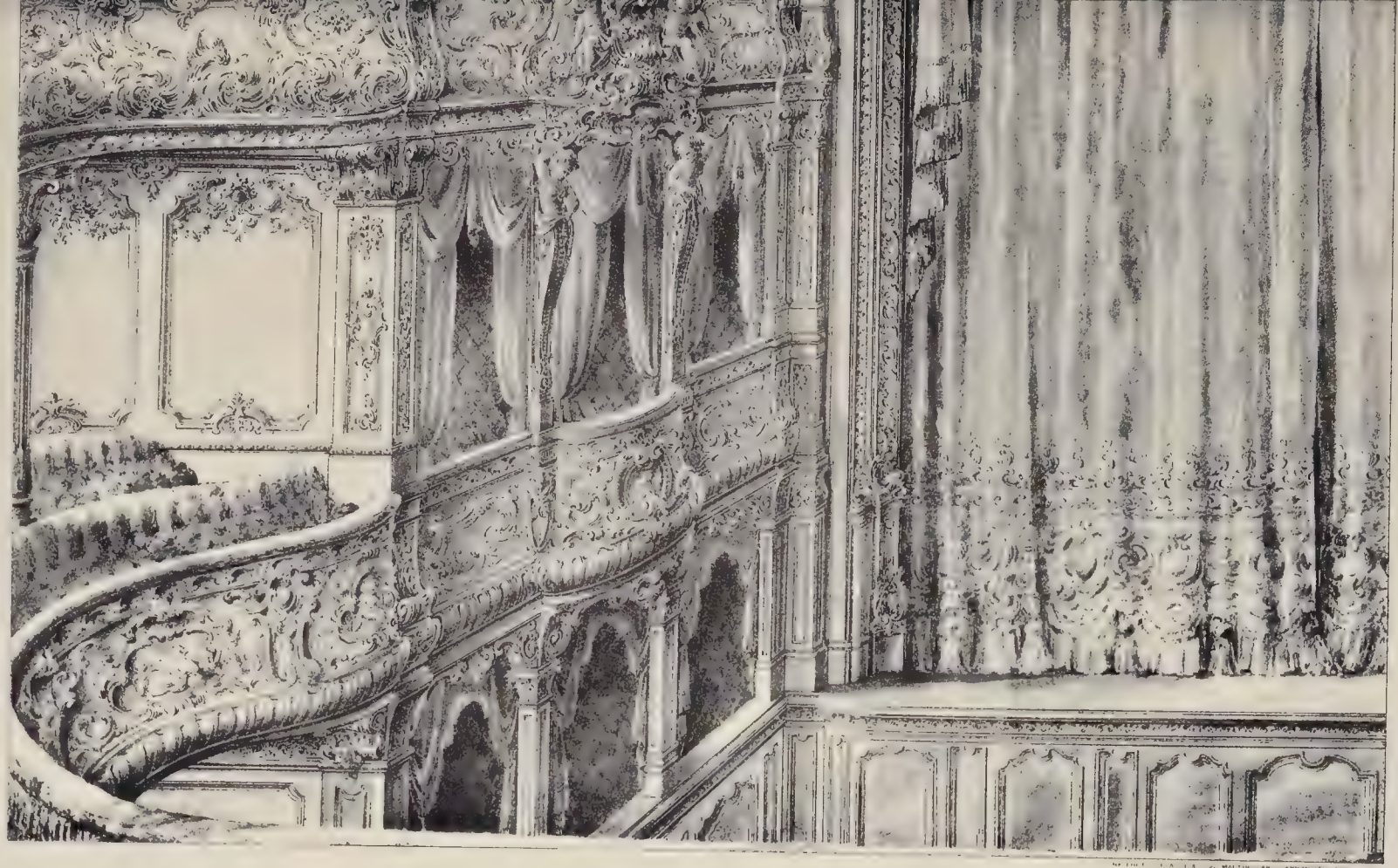
Another point of interest to lessees and owners of building land is that no person can dedicate a road to the public, save the owner in fee, and where lessees for ninety-nine years allowed a road to be used as a public thoroughfare for the whole term, the Court held that the freeholder was able at the expiration of the lease to close the road by erecting a fence across it.

I did not intend, when commencing this paper, to trespass into other professional domains by quoting case-law, but the two cases just mentioned so fully bear out the statement of common law rights, that I am unable to refrain from noticing them.

In these days of Highway Boards and local vigilance the enclosure of waste land next public roads had best be let alone, as it seems of questionable legality.

"If it were once held" [said Lord Tenterden, C.J.] "that only the middle part, which carriages ordinarily run upon, was the road, you might by degrees enclose up to it, so that there would not be room left for two carriages to pass. The space at the sides is also necessary to afford the benefit of air and sun. If trees and


THEATRE DESIGN
LOUIS XV STYLE



DESIGN FOR THEATRE DECORATION IN LOUIS QUINZE STYLE.—By Mr J. Parlby.

hedges might be brought close to the part actually used as the road it could not be kept sound." (Regina v. Wright.)

The wording of the 1st Sub-section of Section 11 of the Local Government Act of 1888 is also significant of the attitude which the County Councils may be expected to take, but I shall refer to that more fully when considering that Act.

The Rights and Duties of Adjoining Owners as Conferred and Imposed by Statute.

The statutes relating to highways are so many in number, and so well understood, that it will be impossible to do more than glance at the various Acts as they extend or limit the operation of the common law.

The first Act which we need consider is the Highway Act of 1835, which provides that each parish shall elect a surveyor of highways, who is to fix direction-posts, place graduated stones or posts where the road is subject to floods, secure the causeways, remove snow or slips, keep accounts, and levy a rate upon all property ratable for poor or highway rate.

In large parishes with a population of 5,000 the Vestry may, by a two-thirds majority, elect any number of persons, not exceeding twenty nor less than five, to form a highway board to discharge the duties which would otherwise devolve upon one surveyor.

For the purposes of this paper the Acts of 1862 and 1864 may be deemed one with the Act just summarised, and adjoining owners were affected by their operation principally as follows:—

1. If liable to repair the highway *ratione tenuræ* they may under section 6 of the Act of 1835 transfer their liability to the parish by paying either an annual or capitalised amount as determined by the Highway Act, 1862, section 35, or the Act of 1864, section 24.

Until 1890 it seems never to have been definitely decided whether the owner or occupier is liable to repair *ratione tenuræ*, but the decision in the case of "The Queen *v.* Barker," reported in Vol. IV., part 3, of "Professional Notes," seems to affirm that it is the occupier who is liable.

2. If liable to repair *ratione clausulæ* (which liability attaches to the occupier and not the owner), the latter may, as we have seen under the common law, find the public trespassing upon his property, should he suffer the roadway to become impassable. But, under this Act, Section 46, the owner may, with the consent of the highway board, if in a highway district, or of the surveyor in other cases, erect fences between his land and the roadway without incurring any liability to repair the roadway as a consequence of so doing.

The Act of 1855 has defined the minimum widths at which the various classes of highways are to be maintained as follows:—

Carriage or cartway, minimum width, 20 ft.
Horseways ,, ,, 8 ft.

Footpaths can only be constructed with the consent of the vestry, and their minimum width is defined as 2 ft.

Whilst considering the minimum widths, I must point out, as probably many members here present have had to do when acting for adjoining owners, that section 80 of the Act of 1835 only compels the surveyor to maintain the clear width of 20 ft. where the space between the road fences will allow of this being done without infringing upon the rights of such adjoining owners.

Where the latter have enclosed against the road the fence and ditch belong to them absolutely, the public roadway extending only to the toe of the ditch.

Any paring away, therefore, of banks or curtailment of ditches can only be done with the consent of the adjoining owners, and if such consent be refused Section 82 of the Act empowers the authority to take the extra ground required, and to compensate the owners, subject to certain restrictions with regard to mines and minerals, timber, &c., which remain still vested in the owners of the fee.

The powers conferred under this Act do not extend to the pulling down of houses, or the compulsory acquisition of gardens, parks, or nursery ground.

If an adjoining owner wishes to put a gate across a highway the Act imposes a minimum opening of 10 ft. for a cartway and 5 ft. for a horseway.

Under Section 51 the surveyor may dig gravel from waste lands, rivers, or brooks without payment, but if sufficient material cannot be obtained from those sources he may give one month's notice to the occupier of any enclosed land (not being a garden) in that or the adjoining parish, to appear before the justices and show cause why gravel should not be dug from such land. The surveyor is to offer compensation and to make good any incidental damage, and the justices may make an order and determine the compensation to be so paid.

The Acts of 1835, 1862, and 1864 all contain clauses compelling the adjoining owners to repair the highway where liable *ratione tenuræ*, unless they prefer to compound with the highway authorities for an annual or capitalised sum to be paid in lieu of the discharge of their obligation.

There are a few nuisances both at common law and by statute for which adjoining owners are liable which it will be convenient to consider under one head.

Nuisances at Common Law.

Where a road has been enclosed the public are entitled to the full use of the width between the fences, and even telegraph poles placed on the waste at the side of the road have been held to be nuisances, and the owners compelled to remove them. Telephone poles, erected without Parliamentary powers, would, of course, be equally indictable.

Adjoining owners may also be proceeded against for allowing their ditches to become so foul as to injure the road by not allowing the surface water to run freely away. They may likewise be summoned for allowing their trees or underwood to overhang to such an extent as to impede the traffic of the highway.

An adjoining owner cannot, without obtaining an Act of Parliament, authorise the taking up of the pavement in order to lay a service-pipe or drain to or from his house, even though, as we have seen, the ground upon which the pavement is laid might be his own property.

Fortunately, however, for Members of Parliament, who would otherwise be inundated with private Bills, adjoining owners are not often required to go to this expense, as the various public companies, who have so kindly undertaken to supply the necessities of modern existence at a profit, have obtained legislative powers, enabling them to open up the ground upon payment of a fee.

The public can only take a highway upon the terms granted them, and as between themselves and the adjoining owners they use the way subject to incidental risks. But such owners are liable for accidents arising from negligence or their own acts, and are not only open to civil action, but even to criminal prosecution.

Thus, a person who turned out a horse upon a common with an unenclosed public footpath, so that a child was killed by a kick of the horse, underwent trial for manslaughter, and was found guilty.

Also, if an adjoining owner excavate so near the highway as to endanger the public, or negligently blasts stone, he runs the risk of a criminal prosecution.

Any person has a common law right to remove an obstruction to a highway, but must show his necessity for travelling over the portion obstructed ("Dimes *v.* Petley").

Nuisances under Statute.

In considering nuisances under statute, it will be sufficient, I think, to summarise the sections of the various Acts defining them.

Section 64 of the Act of 1835 enacts that no tree can be planted within 15 ft. of the centre of any highway.

Section 65 provides that if any adjoining owner neglects to trim his hedges and trees, to the detriment of the highway, he may be summoned before the justices, who may make an order compelling him to do what is necessary within ten days. If such order be not complied with within that time the surveyor may trim the hedges and trees himself and recover the cost.

The order served upon the owner must not be a vague and general one, but must specify what is to be done, and the particular trees or hedges requiring attention, in such a manner as to leave him in no doubt as to the precise manner in which it is meant to be complied with.

This section merely extends the common law obligation which makes the obstruction of a highway by overhanging trees a matter for indictment, but with this difference, that whereas the injury was at common law one sustained by the public, under this section it would be sufficient if only the roadway itself suffered in consequence of the hedges or timber not being properly looked after.

We have already noticed that under the common law adjoining owners could be indicted for allowing their ditches to become foul and so injure the highway.

Section 67 of the Act of 1835 gives to the surveyor power to make, scour, cleanse, and keep open all ditches adjoining any highway, and would, apparently, operate to release the adjoining owners from their common law obligations.

The law officers of the Crown have, however, held (29 J. P. 319) that this section merely empowers, *but does not compel*, the surveyor to cleanse the ditches more effectually than the adjoining owners could be compelled to do.

When such ditches have been so treated by the surveyor it would appear that, under Section 68, they are henceforth under his control, and the adjoining owner is liable for any damage arising from his (the owner's) interference with them.

It is, therefore, worth while for professional men, when acting as agents for adjoining owners, to consider each question of this sort upon its merits, as it is not desirable always to evade one's common law liability at the cost of losing the control of one's ditches.

The law officers of the Crown have, moreover, advised that, to prevent disputes, the surveyors should give notice to the adjoining owners to cleanse the ditches, and should not exercise their powers under this section unless such notice be not complied with.

They also consider that any materials removed under this clause are the property of the adjoining owner, if claimed by him.

Any encroachment by an adjoining owner upon a highway is a public nuisance, and indictable as a misdemeanour. No length of time will legalise it or prevent the public from gaining possession of its site. Such encroachment must, however, be appreciable.

Before passing on to consider additional restrictions imposed by statute upon adjoining owners rather than private persons, there is one point which seems to lack a recorded decision, and upon which other members of this Institution may share my desire for fuller information. In the event of a landslip occurring, by which the soil of an adjoining owner is carried over into the highway, who is liable to remove the soil and repair the road and ditch? If it be the Highway Board, as I suppose, is the soil, as in the case of that removed from ditches, the property of the adjoining owner, and if it be replaced upon his land, is he liable for any costs incurred beyond his contribution as a ratepayer?

Perhaps some gentlemen here who have dealt with a case of this description may be able to throw more light upon these points.

Having now briefly summarised the duties and liabilities of a private adjoining owner under statute, I will conclude by noticing certain exceptional obligations which the law imposes upon railway companies when crossing highways.

By 2 & 3 Vic., cap. 45, railway companies must maintain gates, with a suitable person to open and shut them, across each end of any turnpike or other road. * * *

The Railway Clauses Consolidation Act, Section 11, enacts that no undue deviation from the authorised levels shall be made affecting any street or public highway without the consent of two justices.

Subject, however, to the restrictions imposed by this section, or the special Act, or any Act incorporated therewith, the company may generally alter and divert roads.

The word "conveniently," in section 16, which confers this general power, has been held to mean conveniently both for the company and the public, and "where a company have *bonâ fide*, although acting *ultra vires*, diverted a road with a view to public convenience, a court will not compel them to construct the road *intra vires*, if the result would be a great inconvenience to the public."

Section 46 deals with bridges over and under public roads.

Upon this section it will be sufficient to observe that where a railway crosses a highway otherwise than on a level, and the special Act is silent, the company may carry the road over the railway, or *vice versâ* (R. *v.* S.E R., 17 Q.B.D. 485), where the highway is carried over the railway, the company are perpetually liable to repair the bridge and its approaches ("N.S. Railway Company *v.* Dale").

for the foul air must be provided, there is in every application of natural ventilation a constant danger that, by the fluctuations of the difference of air-pressure, the intended course of the current may be reversed and the outlets become inlets and *vice-versâ*. So that if we use natural ventilation, this is a point that must always be borne in mind and provided against.

The serious character of the irregularity of efficiency in natural ventilation is particularly felt where artificial warming is necessary, for it is at once evident that if the rate of extraction of the warm air and of admission of cold air is fluctuating, very considerable difficulty will be experienced in adjusting the warming power to meet the fluctuation.

SURVEYORSHIPS.

DIOCESAN SURVEYORSHIP, PRETORIA. — Mr. George Arthur Hamliton Dickson, A.R.I.B.A., of the firm of Messrs. Campbell & Dickson, architects and civil engineers, Pretoria and Johannesburg, has been appointed Diocesan Surveyor by the Right Rev. the Bishop of Pretoria, South Africa.

NEW MALDEN.—At the meeting of the New Malden Local Board, on Tuesday evening, Mr. T. V. H. Davidson, Assistant Borough Surveyor of Windsor, was appointed to the joint offices of Surveyor, Engineer, and Inspector of Nuisances to the New Malden Local Board at an inclusive salary of £100 per annum.

GENERAL BUILDING NEWS.

NEW CHURCH HALL AT PECKHAM.—The new Church Hall of St. Mary Magdalene, St. Mary's-road, Peckham, S.E., was formally opened by the Lord Mayor on the 3rd inst. The building, which seats about 400 persons, consists of a hall 51 ft. 6 in. by 31 ft. 6 in., and three adjoining class-rooms, averaging 17 ft. by 14 ft., and is so arranged that by opening revolving shutters every part is in full view of the platform. A soup-kitchen and ample lavatory accommodation are also provided. The interior and external walls of the hall, &c., are faced with best stocks, with red-brick dressings. The whole of the roof is open, and formed with queen-post trusses, which are stained and varnished, as is the whole of the interior joinery. The roofs are boarded with pitch-pine, in narrow widths, and left clean. Each class-room has a fireplace, and the hall is heated by means of two large combination, smoke-consuming and controlled combustion, heating, radiating, and ventilating stoves, supplied by the Carron Company. Mr. W. M. Dabbs, of Portland-avenue, Stamford-hill, was the builder, and the architect is Mr. J. C. Perkin, of New Broad-street, whose design for the building was selected in public competition in April last.

ST. JAMES'S MISSION-ROOM, MOSS SIDE, MANCHESTER.—This building was opened for service on the 6th inst. It is somewhat in the form of a church, and comprises a mission-room, 40 ft. by 31 ft. 6 in., affording accommodation for 250 persons. At the east end is a small chancel, 18 ft. by 9 ft. 6 in., with a vestry on one side and a store-room on the other. The mission-room has an open-framed roof, and is partly lighted by a low clearstory. The front of the building is faced with white bricks, relieved with red bands, and timber-work in the gable, with belfry. The work has been executed by Mr. G. Macfarlane, of Manchester, under the superintendence of the architect, Mr. John Lowe, of Manchester, at a cost, including fittings, of 600*l*.

PUBLIC ROOMS, NEWTOWN, MONTGOMERYSHIRE.—These rooms, after having undergone considerable alterations, extensions, and improvements, have been re-opened. The large concert-room measures 79 ft. by 39 ft., and is 28 ft. high. There are four retiring-rooms or dressing-rooms, a lecture-room on the ground floor, and a large dining-room 49 ft. by 27 ft. above. The New Post-office will not be ready for occupation for a few weeks. A caretaker's house for the public portion of the building is provided, and also one for the Post-office department. The concert-hall has three of Sugg's sun-burners, with powerful extract ventilators attached, and there are numerous Tobin inlets provided. The heating throughout is by hot water, and has been done by King, of Liverpool. The architect for the alterations is Colonel David Walker, of Liverpool. The contractors were Messrs. Davies & Son, Newtown.

NEW PUBLIC HALL, DUNDEE.—On the 29th ult. the Rosebank Public Hall, Dundee, was opened. The building was originally an old factory. The old joists which crossed the roof have been removed, as well as several of the iron columns supporting the roof. The ceiling, which is divided into two sections, and is supported in the centre by a series of columns, takes the shape of a half barrel, and is panelled in wood. Ante-rooms have been provided on either side of the platform, which is situated at the north end of the hall. Retiring-rooms have also been fitted up at the south end, along with lavatories, refreshment-buffet, &c. Over the retiring-rooms at the south end of the hall is a balcony. The hall is capable of seating 1,500 people. The work has been carried out under the supervision of the architect, Mr. Richard J. Murray, Dundee.

BUSINESS PREMISES, BELFAST.—We learn from the *Belfast Newsletter* that a new warehouse for Messrs. Swanston & Bones has been erected on a portion of the large plot of ground in Queen-street, between Messrs. J. & R. Young's premises and College-street. The remainder of the site is taken up by four spacious warehouses, built to the order of Mr. William Swanston, some of which are already let. Messrs. Swanston & Bones' main entrance is placed on the angle formed by the two streets, and has niche shafts of polished Peterhead granite, supporting a boldly-moulded arch. At each side of this are placed carved shields, charged with the arms of the city of Belfast and the province of Ulster respectively. A circular turret starts over the doorway, and is continued up above the main cornice, terminating at a height of 75 ft. in a steeply-pitched conical roof, covered with green slates. The entire frontage is four stories in height, with a massive cornice and parapet above. All the ground floor walling, to a height of 15 ft., is faced with random ashlar of Scrabo sandstone from the Glebe quarry. The dressings of the windows are of rubbed sandstone. A large gateway, with elliptical arch placed in College-street, affords access to the yard of Messrs. Swanston & Bones' premises, which contains engine and boiler house, with a large chimney 90 ft. high. The façades in both streets are broken up by a series of pilasters, which divide them into numerous bays. Mr. Swanston's buildings are designed with a common yard covered with a glass roof in two spans, and so arranged that carts can be loaded in each warehouse. A spacious gateway opening into Queen-street forms the central feature. The windows and other architectural features of this block are similar to the first-described premises. Each warehouse is four stories in height, with ample light at front and rear, all being fitted with hoists and having sanitary improvements of the latest kind. Both of the contracts have been carried out by Messrs. Fitzpatrick, builders, Great Victoria-street, from the plans and under the superintendence of Messrs. Young & Mackenzie, architects, Belfast.

THE PROPOSED NEW CENTRAL CRIMINAL COURTS FOR LONDON.—Writing with regard to some improvements at the Old Bailey, the *City Press* is gratified to learn that something has at last been done to improve the present disgraceful condition of the accommodation provided for prisoners awaiting trial at the Old Bailey sessions. Vast improvements have been nearly completed which will enable untried prisoners to be in something approaching comfort and decency. Even as it is there is much left to be desired, but the present arrangement will serve until the new Central Criminal Courts, so long designed, are built. The City is prepared to take these in hand immediately a settlement is come to with the Home Office. This matter has been awaiting the convenience of the Secretary of State for nearly a year past, and it is quite time that it was taken in hand seriously.

CHRIST CHURCH, GLODWICK.—The chancel of Glodwick Church, Lancashire, has just been re-opened, having been closed for nearly two months, during which time very material alterations have been made. This portion of the church was built some twenty-five years ago by the late Mrs. Clegg, of Broomhurst, Werneth, in memory of her husband, and now, as a fitting memorial to her, the cost of the present alterations has been defrayed by her family. The wooden steps and flooring have been replaced by marble steps and mosaic pavement, and the choir stalls now stand on a pavement of wooden blocks. The two steps at the entrance to the chancel are dark green marble, the sanctuary step of dark red, and that on which the altar stands is white. A dado to the height of about 6 ft. has been placed on the north and south walls of the sanctuary; the plinth red, the same colour as the step, the dado itself being of alabaster marble, with a dark green cornice. A credence table of Caen stone, in character with the reredos, has been let into the south wall, and the reredos thoroughly cleaned. This work has been executed by Messrs Patterson, Manchester. The four panels of the reredos are shortly to be filled with figures in mosaic work, representing the Evangelists.

MAIDEN BRADLEY CHURCH, NEAR FROME. The floor of the chancel of this church has lately been taken out and a new concrete foundation put in, the floor being laid with encaustic tiles. New sanded Keinton stone steps have been placed under the chancel arch. The cost of this part of the work has been defrayed by Christ Church College, Oxford (the patrons of the living), and voluntary contributions. As a memorial to her sister, Miss Elizabeth Beatrice Coles, of Hove, Brighton, Mrs. Hanson, wife of the Rev. E. K. Hanson, the vicar, has placed new sanctuary and altar steps of polished Keinton stone, had the floor of the sanctuary relaid with encaustic tiles, and given new altar-rails, the standards of which have been manufactured by Messrs. J. W. Singer & Sons, Frome. The tiles were supplied by Messrs. Webb & Co., of Worcester. The whole of the work has been carried out by Mr. John Vallis, Frome. The architect concerned was Mr. F. W. Hunt, of London. Mrs. Hanson has painted an altar-piece. In the north panel is a figure of St. Cecilia, in the south panel a figure of St. Elizabeth of Hungary, and in the centre panel St. George, St. Hugh of Lincoln (prior of Witham Friary), St. Agnes, and St. Mary Magdalene.

NEW BOARD SCHOOLS, READING.—New schools have just been erected by the Reading School Board on land between the Hatherley-road and Blenheim-gardens-road. The new buildings will provide accommodation for 1,166 children, and in addition a centre is provided for teaching cookery. The style of architecture adopted is a free treatment of "Queen Anne." The walls are of red brick, and all the mouldings and ornaments are cut out of the same material, and the roofs are tiled. The ground floor is occupied by girls, and the upper story by boys. In the centre of the plan is a corridor, 56 ft. long and 16 ft. wide, around which the several class-rooms are arranged, each with a separate door into the corridor. The floors of the upper corridor and upper clothes-room are of fireproof construction on Homan & Rogers' patent principle, and the staircases are of Wilkinson's patent stone. The infants' department forms a separate detached block of one story in height, and consists of a schoolroom divided into two by patent swivel partitions, two senior class-rooms, and a babies' class-room. Each division of the school-room and each class-room has separate access to an entrance corridor. A clothes-room has been provided. There is a lavatory adjoining the clothes-room, and teachers'-rooms are provided on an upper floor. The cookery centre is a detached building. The surface of the ground-floor throughout is covered with concrete and Portland cement, and all the rooms and corridors on the lower story have floors of patent pitch-pine blocks, keyed with steel discs, and laid in herring-bone pattern in a composition of asphalte. Similar flooring is also laid to the upper corridor upon the fire-proof construction. The corridors and clothes-rooms are heated by hot-water pipes and coils, and the rooms by Shorland's patent "Manchester" ventilating-grates. There are also vertical tubes provided for the admission of cold air, and upcast foul-air flues are constructed side by side with the smoke flues for carrying off vitiated air. The schools have been erected from the designs of Mr. S. S. Stallwood, of Reading, and the works have been carried out, under the direction of the architect, by Messrs. Winter & Fitt, builders, of Reading.

RENOVATION OF ST. BEDE'S CHURCH, LIVERPOOL.—This church, situated in Hartington-road, has just been re-opened, after having undergone various alterations. In consequence of dry rot, all the old floors and the wet soil beneath them have been entirely removed, and the whole area covered with concrete and wood-block floors. A new inner roof of pitchpine has been erected at a distance of 14 ft. lower than the original roof. A new heating apparatus has been inserted by Messrs. Newton, Chambers, & Co., and the vestry and church-room warmed by hot-water pipes. A new system of lighting has also been introduced by Messrs. Sugg. The church has been decorated throughout by Messrs. A. L. Moore & Co., of London. The general contractor has been Mr. Thomas Haigh, of Liverpool, and the whole of the work has been carried out under the supervision of Messrs. Habershon & Fawckner, architects, London. The cost of the various works has been about 1,800*l*.

NEW R.C. CHAPEL AND SCHOOLS, DUNDEE.—On the 25th ult., the new Roman Catholic schools and chapel erected at Lilybank, Dundee, were opened by the Rev. Bishop Smith. The building, which has been erected from plans prepared by Messrs. Pugin & Pugin, London, stands at the angle formed by the junction of Lilybank-road with Robertson-street. The schools are in the Gothic style of architecture. Internally the structure is divided into two stories. The lower portion is reached by a short flight of stairs, and is divided by glass partitions so as to provide three rooms. The chapel is on the upper story.

RESTORATION OF PRESTWOLD CHURCH. — The ancient little church at Prestwold, Leicester, has recently undergone restoration. Latterly the church had become dilapidated, and Sir Arthur Blomfield, A.R.A., was consulted as to the best means of effecting an improvement. Acting upon his advice, it was decided to remove the old Italian nave, to replace it with a nave of the Gothic style of architecture, and to entirely re-model the internal arrangements. The work was entrusted to Mr. John Thompson, of Peterborough. Externally the church has undergone considerable alteration, a new high-pitch roof taking the place of the flat roof on the old building. The roof is covered with Broseley tiles. Internally the gallery has disappeared, and the arch between the tower and nave has been opened out again and restored to its original proportions. The roof is of oak with tracery principals, and at the north-east end of the nave an organ chamber has been added. The nave is lighted by three Gothic windows on the north side and four on the south. The windows throughout are glazed with cathedral tinted glass. The floor in the aisle is composed of red tiles, and in the seats of wood blocks. The whole of the internal fittings are of oak. The octagonal pulpit is also of oak. At the east end the three-light window with Gothic tracery has been filled in with stained glass by Messrs. Powell & Son, of London. The church is heated by hot-air apparatus. The whole cost of the restoration has been borne by Mr. Hussey Packe.

OPENING OF A BOARD SCHOOL AT YORK.—On the 1st inst., the first Board School for York was formally opened. Externally the buildings are built of red brick, with pressed brick dressings and arches, and green slated roofs. The style is based on that of the Netherlands in the seventeenth and eighteenth centuries. The buildings are arranged in two blocks. The boys' and girls' schools are on the north side of the site, and fronting on to Shipton-street, with the caretaker's cottage at the north-west corner, and the infants' school at the south-west side. The boys' and girls' schools are for 460 children, and are arranged with central hall corridors, with the school and class-rooms, &c., opening into them. The halls are each 50 ft. by 14 ft. The school rooms are on the south side, and there are five class-rooms on the north side. There are also separate coat and cloak-rooms. The infants' school will accommodate 200 children, and consists of entrance corridor, with a cloakroom adjoining, schoolroom, class-room, and other rooms. The buildings are warmed on the warm-air system; in addition to which fire-places are provided in the school and class-rooms and a system of hot-water circulation in the corridors and cloak-rooms. The work has mostly been executed by local contractors as follows:—Messrs. Wilson & Sons, general contractors and joiners; Messrs. J. & T. Biscomb, masons and bricklayers' work; Messrs. Rawling & Sons, plasterers' work; Mr. Hardgrave, slating; Mr. T. G. Hodgson, plumbing; Mr. J. Thomas, painting. The architects were Messrs. Demaine & Brierley, of York. The cost of the undertaking is about 6,500*l.*

SANITARY AND ENGINEERING NEWS.

THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN.—At the usual monthly meeting of this Association, held on Saturday last, at Carpenter's Hall, an address on "London Sanitation and Sanitary Inspectors," was given by Captain W. H. James, R.E., who was until lately the Chairman of the Sanitary Committee of the London County Council. A report is in type, but is unavoidably held over until next week.

WATERWORKS FOR PRETORIA, SOUTH AFRICA.—Messrs. Campbell & Dickson, A.R.I.B.A., are the resident engineers of the Pretoria waterworks, now in course of construction, Mr. E. Pritchard, of London and Birmingham, being the Consulting Engineer in England.

THE SANITARY INSTITUTE'S EXAMINATION FOR SANITARY INSPECTORS.—At an Examination for Inspectors of Nuisances, held at Leeds on December 19 and 20, thirty Candidates presented themselves. Questions were set to be answered in writing on the 19th, and the Candidates were examined *viva voce* on the 20th. The following seventeen Candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspector of Nuisances:—T. Brindle, Chorley; J. Brown, Whitby; W. H. Crane, Hull; W. H. Harrison, Rotherham; W. A. Mason, Shildon; W. Matthews, Kidsgrove, Derby; G. Milne, Sanitary Inspector, Ballater, N.B.; T. S. Prescott, Gorton; J. T. Proffitt, Boston; W. B. Shaw, Wellingborough; R. Skinner, Leeds; J. W. Smith, Carlisle; J. Spencer, Keighley; T. J. Trowsdale, Stockton-on-Tees; T. W. Waddington, Padiham; S. Webster, Liverpool; and T. Windle, Burnley.

THE "AMINES" PROCESS OF SEWAGE PURIFICATION.—Mr. E. B. Ellice Clark, M.Inst.C.E., requests us to announce that he has resigned his seat at the Board of the Amines Syndicate (Ltd.), and that he has no further connexion with the company.

SCARCITY OF WATER IN LIVERPOOL.—At the monthly meeting of the Liverpool Town Council on Wednesday Mr. Bowring called attention to the present unsatisfactory state of the water supply to the city. He asked the cost of the straining tower at Vyrnwy Works, and what progress had been made with the cutting under the Mersey, and urged that temporary pipes should be laid on the bed of the Mersey, in order that people who were paying 85,000*l.* a year for the water should obtain some of it.—Sir W. B. Forwood also urged the necessity of energetic steps being taken, not only to get water from Vyrnwy, but for the relaying of pipes from Rivington, which were now so corroded that, instead of getting 16,000,000 gallons a day, they could only get 12,500,000 gallons.—Alderman John Hughes, Deputy Chairman of the Water Committee, said that a special meeting of the Committee had been called to consider the matter, and he believed they would not permit any delay whatever. The straining tower and plant had cost 34,000*l.*, as he had been informed.

STAINED GLASS AND DECORATION.

DODDINGTON CHURCH, CAMBS.—Stained glass has been inserted into the east window of the old church of Doddington, Cambs. The work, which has been executed in the style of the fifteenth century, illustrates the principal events in the life of the Saviour. It is from the studio of Messrs. Powell Brothers, of Park-square, Leeds.

WETHERBY CHURCH.—In memory of the late Miss Sanderson, the western tower window has just been filled with richly-coloured stained glass, illustrating the subject, "Christ blessing little children." The work has been designed and executed by Messrs. Powell Brothers, of Park-square, Leeds.

MEMORIAL WINDOWS, WARFIELD.—Three new memorial windows, the gift of Mrs. Cazenove and her family, were unveiled in the parish church of St. Michael and All Angels, Warfield, Berks, on Christmas Day. The designs have been executed by Messrs. Powell & Sons, of London. The subjects are "Christ blessing little children," and "Christ approaching the storm-tossed ship, and saying, 'It is I, be not afraid.'" A small lancet window contains the simple figure of the "Good Shepherd."

MEMORIAL WINDOW, ST. MARK'S CHURCH, BROOMHILL.—A new memorial window has just been erected in St. Mark's Church, Broomhill, near Sheffield, in memory of Alderman Brooksbank J.P., of Southbourne. The window has been executed by Messrs. Clayton & Bell, of London. It is a three-light window, situated at the east of the south aisle, and the subjects selected for representation are the parables of the ten talents and of the Good Samaritan—three scenes from each.

WORDSLEY.—A stained-glass window has just been placed in a side window of the chancel of Wordsley Church, by Messrs. G. & E. Webb, of Wordsley, Stourbridge. It consists of two lights, divided by a transom and tracery; the subjects illustrated are:—"The Three Marys going to the Tomb to Anoint the Body of Our Saviour," "The Resurrection," "Our Saviour and Mary Magdalene in the Garden," and "The Unbelief of St. Thomas," with angels in the tracery bearing text, and the whole having a structural canopy and base. The window has been designed and carried out by Messrs. Winfields (Limited), of Birmingham.

FOREIGN AND COLONIAL.

FRANCE.—At the Champ de Mars offices last week M. Alphand was presented with his bust in marble by the general staff of the Direction of the great Exhibition. Among those present were MM. Charles Garnier, Contamin, Dutert, Formigé, and Bouvard. M. Alphand has since left for Pau in company with M. Laforcade to direct the works of embellishment there.——M. Dézermaux, architect for the buildings for Class 63 at the great Exhibition, has been appointed architect for the French Exhibition to be opened this year at Moscow. The engineer in chief for the same Exhibition is M. Berthot, who was engineer for Classes 50, 51, and 56 in the 1889 Exhibition.——The Municipal Council of Paris have now let the Palais des Beaux Arts to the Musée des Arts Decoratifs, at an annual rental of 30,000 francs, and on the condition that the galleries necessary for the Meissonier Salon should be let to that body at a rent of not more than 15,000 francs yearly.——A committee has been formed, under the presidency of the Minister of Public Instruction, for erecting a statue to the poet Moreau.——The town of Epernay has opened a literary and artistic competition in honour of Joan of Arc; the artistic portion will include pictures, enamels, faïence, etchings, statues, bas-reliefs, medallions, &c. The sole condition is the personification, in whatever manner, of the pet heroine of France.——The President of the Republic has presented to the "Cercle National des Armées de Terre et de Mer" a splendid centrepiece in Sèvres porcelain, representing the "Triumph of Bacchus."——It is stated that M. Falguière, the eminent sculptor, has given in his adherence to the Salon Meissonier, and will send his works there this year.——The Académie des Beaux Arts has elected M. Meissonier as its president for 1891, and M. Bailly, the architect, as vice-president.——The death is announced of the painter, Julien Perret, at Saint-Chéron, in his thirtieth year.——The death is also announced of the architect G. Giucestre. He was born in 1857, entered the École des Beaux Arts in 1877, and on leaving the schools founded a preparatory academy of architecture which he directed with great success.——A competition was recently opened for a new Chamber of Deputies and Senate House at Bucharest. The French architects, MM. Vallot and F. Jolly, who were appointed judges of the competition, have awarded the first premium for the Chamber of Deputies to M. Maernarolu, a Roumanian architect, and that for the Senate House to M. Alexandre Marcel. The second premium for the Senate House has also gone to a Frenchman, M. Albert Ballu, and the third to a Roumanian, M. Socolesco.——The Righi railway is about to have its counterpart in France in that which will take tourists from La Mure to the summit of Mount Beaumont, in the Hautes Alpes, a height of about 1,900 mètres. A large hotel will be built on the summit, from which there will be a splendid view over the surrounding country. The works will be commenced in the coming spring.——The ancient college of Bar-le-Duc, founded in 1563 by Gilles de Trèves, is about to be restored for use as a girls' school. It is one of the rare examples of the architecture of the sixteenth century, and M. Demoget, the architect commissioned to carry out the necessary work, will scrupulously respect, we are told, all existing details.——M. N. Marnier, of the Academie Française, has promised to leave his valuable collection of engravings and rare books to the town of Pontarlier (Jura).

THE GREAT STEEL BRIDGE ACROSS THE COLUMBIA RIVER AT VANCOUVER.—An American paper says that, according to published accounts of the great steel bridge across the Columbia River at Vancouver, its length will be 6,000 ft. from the Washington to the Oregon shore. It will be double-tracked, with a roadway on top for teams. The opening available on each side of the draw-pier, for vessels to pass, will be 200 ft. The whole structure is to be of steel, built 10 ft. above the high water of 1876, and 40 ft. above low water. It will probably not be completed before January, 1892.

TESTS OF MATERIALS OF ARCHES IN AUSTRIA.—Tests of the resisting-powers of arches of different materials are about to be carried out on a large scale by the Society of Engineers and Architects of Austria. The tests will be divided into three groups. Group I. will comprise tests of strength and elasticity of the materials used in arch work; Group II., resistance tests of small span arches; and Group III., resistance tests of bridge arches of spans of 23 mètres (about 75 ft.). Special interest, it is thought, will be attached to the tests comprised by this last group. Different kinds of masonry and *béton* arches will be tried and compared with an iron arch of the same dimensions. The arches are to be tested with special reference to their use as railroad bridges. The loads are to be gradually increased until the arches give way. Careful observations are to be made of the behaviour of the latter during the different load applications; measurements of their distortion are to be carried out, &c. The trials will be conducted in one of the quarries near Vienna. It is understood that the cost of the trials will be covered by subscriptions by various railroad companies and others, and that ample funds will be available for a thorough investigation.—*Engineering Record, N.Y.*

MISCELLANEOUS.

THE INSTITUTION OF CIVIL ENGINEERS was founded on January 2, 1818, so that it has reached its seventy-third anniversary. Its Presidents have been, successively, *Thomas Telford, James Walker, Sir John Rennie, Joshua Field, Sir William Cubitt, James Meadows Rendel, James Simpson, Robert Stephenson, Joseph Locke, George Parker Bidder,* Sir John Hawkshaw, *John Robinson McClean,* Sir John Fowler, Bart., K.C.M.G., Sir Charles Hutton Gregory, K.C.M.G., *Charles Blacker Vignoles,* Thomas Hawksley, *Thomas Elliot Harrison,* George Robert Stephenson, *John Frederic La Trobe Bateman,* William Henry Barlow, James Abernethy, Lord Armstrong, C.B., Sir James Brunlees, Sir Joseph William Bazalgette, C.B., Sir Frederick Joseph Bramwell, Bart., Edward Woods, and Sir George Barclay Bruce. The names in *italics* indicate those who are no longer living. The present President is Sir John Coode, K.C.M.G. The numbers of the various classes now on the books comprise 1,700 Members, 2,880 Associate Members, 427 Associates, 19 Honorary Members, and 927 Students—together, 5,953.

SELBY ABBEY.—The *Leeds Mercury* gives the following extract from a report of the Vicar of Selby in regard to the progress of the work of repair at Selby Abbey:—"In a little over twelve months the large sum of nearly 7,000*l.* has been raised, a considerable portion of which has come from the people of Selby themselves. I think we may accept this as one proof, at least, that there exists in the town deep affection for our beautiful old church. I am frequently asked, 'When will the work at the church be finished?' It is a question difficult to answer, for several reasons. In the first place, the progress must necessarily be slow, for we are building what we hope will last—not for years, but for generations. Again, much depends upon the extent of the work. Our present funds are sufficient for the interior work, but there remains the work in connexion with the tower and south transept, which we shall undertake if additional funds come in.'

THE HARROW AND STANMORE RAILWAY.—This new branch line to Stanmore from the London and North-Western main line at Harrow was formally opened to the public on the 18th ult., by Mr. Findlay, of the London and North-Western Railway Company. The new railway will open up some of the most beautiful and picturesque country within easy distance of London, and now, with increased railway accommodation, Stanmore will doubtless become a favourite residential district of the highest class. Mr. R. T. Wreathall, F.S.I., of London and Harrow, the surveyor to the Company, bought the land for the line, which is being worked by the London and North-Western Railway Company.

THE INSTITUTION OF ELECTRICAL ENGINEERS.—The opening meeting of this Institution for the current session will take place on Thursday, the 15th inst., when the President, Mr. W. Crookes, F.R.S., will deliver his inaugural address.

THE ST. PAUL'S ECCLESIOLOGICAL SOCIETY.—At the next meeting of this Society, to be held at the Chapter House, St. Paul's, on Wednesday next, a paper will be read by Mr. Edward J. Tarver, F.S.A. on "Screens."

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*New Markets and Abattoirs	Bury Corporation	75*l.* 50*l.* and 25*l.*	Mar. 31
*New Municipal Buildings, Police Court, &c	do.	150*l.* 100*l.* and 50*l.*	do.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Water Tanks for Stations, Tyres, and Galvanised Roofing	India Office	*Official*	Jan. 13
*Sewerage Works	Tottenham Local Bd.	J. E. Worth	do.
*Works and Materials	Wandsworth Bd. of Wks	*Official*	do.
*Main Drainage Extension	West Ham Council	Lewis Angell	do.
Paving Setts, &c.	Sowerby Local Board	Ell Hartley	do.
Tool Works Chimney, Offices, &c. Water-lane, Halifax	.....	Jas. Farrar	do.
Providing and Laying Pipe Drain	Billericay U.R.S.A.	*Official*	do.
Steel Rails, Steel Sleepers, and Fishplates	Bombay, Baroda, and Cent. India Ry. Co.	do.	do.
New Offices, Warehouse, and Factory Buildings	M'Caw, Stevenson, & Orr, Lim.	W. H. Stephens	do.
Additions and Alterations to Hotel, Porthcawl	Porthcawl Hotel Co. Lim.	G. J. Brind	Jan. 14
Iron, Smithwork, &c.	Belfast Police Com.	*Official*	do
*Execution of Works for Three Years	Hackney Bd. of Works	J. Lovegrove	do.
*Removal of Dirt, Dust, Ashes, &c.	Crown Estates Paving Commrs.	*Official*	do.
*Roadmaking and Paving Works	Hammersmith Vestry	H. Mair, C.E.	do.
*Works at Burton-on-Trent and Leeds	M. R. Co.	*Official*	Jan. 15
Police Station, Low Moor, near Bradford, Yorks	Standing Joint Com. of West Riding	J. V. Edwards	do.
Thirty-four Cottages, New Tredegar	New Tredegar Building Co. Lim.	.....	do.
Taking-down and Re-building the "Three Compasses Inn," Charminster, near Dorchester	.....	Crickmay & Sons	do.
*Iron Gates and Gate Posts	Central Markets Com.	*Official*	Jan. 16
New Post-office, Stratford-on-Avon	Com. of H.M. Wks, &c.	do.	do.
Repairing Roads and Bridges at St. Andrews and Speymouth	Elgin County Council	H. J. Mackenzie	do.
*Erecting and Completing Boundary Wall, Railing, and Entrances to Churchyard	Commrs. of Sewers	*Official*	do.
Road Metal, &c. Elgin, N.B.	.....	H. J. Mackenzie	do.
Chimney Stack and Porch at Workhouse	Cardiff Union	Seward & Thomas	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Thirty Dwelling-houses, Halifax	.....	Horsfall & Williams	Jan. 17
*Making 600 yards of Roadway, Sawridge-worth	.....	A. U. Higgins	do.
*Repair and Maintenance of Water Carts and Vans	St. Pancras Vestry	W. B. Scott	Jan. 19
Hotel, Tonypandy, Rhondda Valley	Tonypandy Brewery	.....	Jan. 20
Thirty Cottages, Kinsley Common, near Wakefield	New Hemsworth Colliery Co. Lim.	.....	do.
*New Police Station, &c. at Leek	Staffs. County Council	W. Sugden & Son	Jan. 22
Banking Premises, Leeds	York City and County Banking Co.	Smith & Tweedale	do.
Two Shops and Offices, Southgate-street, Halifax	.....	Jas. Farrar	do.
*Erection of Houses, &c. Lydd, near Kent	Admiralty	*Official*	Jan. 23
*Improvement of River Lea	Birmingham Public Works Com.	W. S. Till	Jan. 24
New "Boar's Head Inn," Southgate, Halifax	.....	Jas. F. Walsh	do.
*Weights and Measures Office, Newington Addittons to New Town Schools	London County Council Wednesbury Sch. Bd.	*Official* E. Pincher	Jan. 27 Feb. 1
Four Small Villas, Ryeland Estate, Hereford	.....	W. W. Robinson	No date
Cliff Railway or Lift at Clifton, Bristol	Geo. Newnes, M.P.	Marks & Munro	do.
Alterations to "Speed the Plough Inn," Felling	Mr. J. White	B. F. Simpson	do.
Restoring and Enlarging Church at Wallsend	.....	Hicks & Charlewood	do.
Felling and Cutting Timber, W. Hartford	Mr. J. Foggo	.....	do.
Free Library and Technical School, Ashton-under-Lyne	.....	J. Eaton & Sons	do.
*New Medical Schools, Owens College, Manchester	.....	A. Waterhouse	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Surveyor's Assistant	Burton-on-Trent Coun.	150*l.*	Jan. 14
*Accountant Clerk	Civil Service Com.	Not stated	do.
*Temporary Civil Engineering Assistant	Hull Corporation	200*l.*	Jan. 19
*Engineer Students and Students in Naval Construction	Civil Service Com.	Not stated	Mar. 16
Surveyor, &c.	Ware R.S.A.	120*l.*	No date

Those marked with an Asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv. *and* vi. *Public Appointments, p.* xxi.

MESSRS. BOLLING & LOWE'S STEEL AND IRON REPORT.—Messrs. Bolling & Lowe, in their annual report on the iron and steel trade, thus refer to the possible effects of the spread of Protectionist ideas abroad upon our iron and steel trade:—"The United States, under influence of the Republican party, now in power, have lately fixed a new and higher tariff in order to encourage home industry, which will do its utmost to prevent imports of manufactured articles from Europe. Such an extreme Protectionist tariff would, under ordinary circumstances, have encouraged American manufacturers immediately to launch out in extension of works, and to lay down new plant for the production of articles so heavily taxed, but as yet they hesitate. This hesitation may be founded on the fact that the recent elections in the United States have gone in favour of the Democratic party, which objects to heavy taxation of ordinary necessaries of life and comfort. Therefore, in the near future, there looms a possibility of this crushing tariff being cut down to a moderate scale. The imports into the United States of iron and steel and other articles might consequently not diminish materially for some time, as soon as the enormous stocks, hurried in before the tariff came into force, are lessened. Tinplates (our most valuable metal export to the United States, 4,386,133*l.* for eleven months) will have the benefit where they have come from this country, and can be proved to have been worked up into goods for export, that the duty will be refunded by their Government to the exporter, less a deduction of one per cent. There is a continued tendency in nearly all countries to increase their protective duties. We have seen what has taken place in the United States; France is on the point of rearranging all her tariff in this spirit, and Russia is on the same path. It has now become a very important question for manufacturers and traders in Great Britain to consider whether there are any means by which this threatened exclusion of British steel, iron, and machinery can be reduced to a reasonable proportion. It is all very well to say to foreign nations that we can sell them goods cheaper than they can themselves produce, but if they make up their minds and will become manufacturers "at any cost," then argument ceases to be of any avail, and unless we can show them a good set-off, either by a benefit or loss to them, in other way of trade for not meeting us, they will continue to adhere to their Protectionist ideas, and our markets become more and more curtailed."

ELECTRIC LIGHT IN THE CITY.—By the arrangement the Commission of Sewers has made with the various electric lighting companies interested, when the companies are in a position to pay 10 per cent. to the shareholders, a reduction will be made to private consumers. The Commissioners, we learn, expect that within twelve months the installation will be complete.—*City Press.*

INDUSTRIAL DEVELOPMENT AND TECHNICAL TEACHING IN THE WILDS OF DONEGAL.—A lecture on this subject, in aid of the funds of the Technical School of the Donegal Industrial Fund, and illustrated by dissolving views, will be given by Mrs. Ernest Hart, in Princes' Hall, Piccadilly, on Monday, January 19, at five p.m.

MESSRS. MATHESON & GRANT'S ENGINEERING TRADES' REPORT.—Messrs. Matheson & Grant, in their circular report dated the 1st inst., say, "The year just closed has been the most prosperous since 1873, for though in the autumn of 1879 there was a sudden revival and a rise in prices even greater than has lately prevailed, that revival was due to temporary causes and subsided early in the following year. The present activity has already lasted two years, it is still in operation, and, subject to certain contingencies, is likely to continue for some months to come. The Board of Trade Returns for the whole year show an improvement over 1889, although there is a diminution during the last few months. The engineering trades are particularly dependent on foreign enterprise, and when, in 1888, the accumulation of public works waiting to be done culminated in a general launching of such projects, ample capital was available for their accomplishment. South America, which has during the last few years played so important a part as a customer for the engineering manufactures of this country, is now an immediate cause of depression. The natural demands of the Argentine Republic, stimulated by bold financiers, have led to excessive borrowings, and engineers, together with the trades depending on them, who have benefited by the expenditure, are likely to feel most keenly the reaction now that the supply of money is arrested. Harbours and docks, waterworks on an unprecedented scale, mining projects, railways, electrical schemes, have all been equipped from Great Britain, and contracts for such supplies will be running for some months to come. The private Bills and provisional orders for the coming session, though much fewer in number than usual, will involve considerable expenditure among engineers and the trades dependent on them. Most of the principal railway companies are seeking powers for extensions, and in some cases for amalgamation with other lines. The proposal for a new route from the midland districts to London will be met with great opposition, and for the present is hardly likely to be authorised. The light railways already commenced in Ireland will open out new districts to further enterprise and development. Numerous schemes for canal and river improvement, giving cheap access from the inland towns to the sea, and even schemes for ship railways, are supported by capitalists.

NEW PARTNERSHIPS.—Mr. Percy Scott Worthington, M.A., who is an Associate member and medallist of the Institute of Architects, has joined the firm of Messrs. Worthington & Elgood, of Manchester, who will in future conduct their practice in conjunction with him, under the same style as before.——Mr. W. F. Miles, F.S.I., of the firm of Miles & Miles, Friar-lane, Leicester, announces that he has taken into partnership Mr. J. A. L. Beasley, who for a long time has been associated with the practice, having served his articles with the late Mr. E. L. Miles. The style of the firm will in future be "Miles & Beasley."

FAILURES IN THE BUILDING AND TIMBER TRADES.—According to *Kemp's Mercantile Gazette* there were last year 701 failures in the building and timber trades, as compared with 711 in 1889, 785 in 1888, 761 in 1887, and 712 in 1886.

THE ENGLISH IRON TRADE.—After longer holidays than usual for business cannot be said to have commenced virtually before last Monday—the market opens the new year dull and weak. Nearly all the pig-iron markets this week were almost lifeless, the little trade that has been done being carried through only if lower prices than those current were accepted by makers. In Scotland the strike of the blast furnace-men and of the railway men combined, continues to paralyse business, while the warrant market has been extremely quiet. Very little has been done in Cleveland pig-iron, and similar accounts reach us from Lancashire and of the north-west of England. It is evident that transactions in finished iron and steel will not become more numerous until the quarterly meetings this week have shown what turn the market will take. Common bars are 5*s.* a ton lower, and shipbuilding material, both iron and steel, is also cheaper. Steel has receded from 2*s.* 6*d.* to 5*s.* a ton. The shipbuilding trade is very quiet as far as inquiries are concerned. Engineers open the year well on the whole, but there are signs of coming quietness in some branches.—*Iron.*

PROGRESS OF THE PLUMBERS' REGISTRATION MOVEMENT.—At the quarterly meeting of the Court of the Plumbers' Company, at the Guildhall, on the 29th ult., under the presidency of the Master (Mr. W. H. Bishop), Sir Philip Magnus brought forward a report showing that 1,350 apprentice and journeymen plumbers are now attending plumbing classes in London and the provinces, and that at examinations for the last session, held at Bristol, Edinburgh, Glasgow, Leeds, Liverpool, Manchester, and Newcastle-on-Tyne, the average number of "passes" was 44 per cent. of the total number of candidates. The Court had under consideration applications for aid in connexion with the plumbing classes at Plymouth and Dublin. The Court received a report of the presentation by the Mayor of Belfast of the Company's prizes to the successful students in the plumbing classes at Belfast.

DINNER TO BUILDING WORKMEN.—On New Year's Eve Lord Walsingham gave a dinner, at the King's Arms Inn, Watton, to the workmen, some 50 in number, employed by Mr. William Hubbard, of East Dereham, in building the new stables, &c., at Merton Hall, Norfolk. Mr. W. D. Hubbard presided, and the vice-chair was taken by Mr. Thwaites, the foreman of the works. After the usual loyal toasts, "The Health of Lord and Lady Walsingham" was proposed by Mr. Hubbard, and, of course, enthusiastically drunk. The architects of the new buildings (which replace those which were destroyed by fire in April last) are Messrs. Milne & Hall, of London.

THE ELECTRIC LIGHT AT DURHAM CATHEDRAL. A proposal has been made to light Durham Cathedral with electricity in future, instead of with gas, the motive power to be derived from the River Wear.

ROYAL SOCIETY OF ANTIQUARIES OF IRELAND.—The annual general meeting of this society will be held in the Lecture Theatre, Royal Dublin Society's House, Kildare-street, Dublin, on Tuesday next, January 13.

THE RECENT FIRE IN QUEEN VICTORIA-STREET.—Messrs. Thos. Thomas & Sons, hoisting engineers, announce that in consequence of the recent fire at 141, Queen Victoria-street, and pending the rebuilding of their late premises, they have taken offices temporarily at Metropolitan-buildings, 63, Queen Victoria-street.

MEETINGS.

MONDAY, JANUARY 12.

Royal Institute of British Architects. — Business Meeting for Members only. 8 p.m.

Liverpool Architectural Society.—Mr. T. Mellard Reade, the President, on "Slates and Slating." 7 p.m.

Leeds and Yorkshire Architectural Society. — Mr. Heywood Rider on "Decorative Art in its relation to Architecture." 7.30 p.m.

TUESDAY, JANUARY 13.

Institution of Civil Engineers.—Mr. W. H. Allen on "Auxiliary Engines in connexion with the Modern Marine-Engine." 8 p.m.

Society of Biblical Archæology.—Anniversary Meeting. 8 p.m.

Royal Society of Antiquaries of Ireland.—Annual General Meeting, Dublin. 4 p.m.

WEDNESDAY, JANUARY 14.

South Kensington Museum (Lecture Theatre).—Mr. Maurice Hewlett on "The Rise of the Renaissance in England." II. 3.45 p.m.

St. Paul's Ecclesiological Society.—Mr. E. J. Tarver, F.S.A., on "Screens." 8 p.m.

Society of Arts.—8 p.m.

Liverpool Engineering Society. — Annual Dinner, Adelphi Hotel, Liverpool. 7 p.m.

THURSDAY, JANUARY 15.

Institution of Electrical Engineers.—Inaugural Address by the President, Mr. W. Crookes, F.R.S. 8 p.m.

Society for the Encouragement of the Fine Arts.—Conversazione at the Galleries of the Institute of Painters in Water Colours, Piccadilly. 9 p.m.

Society of Antiquaries.—8.30 p.m.

Edinburgh Architectural Association. — Mr. H. Bellyse Baildon, M.A., on "Art Delight." 8 p.m.

Dundee Institute of Architecture.—Paper by Mr. Campbell Douglas, entitled "Some Architectural and other Notes on Portugal and Spain." 8 p.m.

FRIDAY, JANUARY 16.

Institution of Civil Engineers (Students' Meeting).—Mr. R. G. Hansford Worth on "A Survey of the Bed of Sutton Pool, Plymouth." 7.30 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

268.—BRICK-MAKING MACHINERY: *W. L. Gregg* (U.S.A.).—According to this specification, the improvements made by the patentee in the class of machinery or apparatus used in the manufacture of ornamental bricks consist chiefly in providing the machine with wheels to facilitate its movement from place to place; in providing the mould-box with a steel lining; and in an arrangement of springs and rods which operate the plunger.

9,637.—ROOFING TILES: *B. Edwards.*—According to this invention, on the weather face of each tile or slate where the overlapping tile reaches to one or more projecting bosses or short studs, the studs are so placed that the tile immediately above it is supported in such a manner that it is impossible for it to slip out of place or fall to the ground. Every tile when fixed on a roof has a two-fold instead of a single means of support.

12,419.—DOOR BELLS: *A. F. Rockwell (U.S.A.).*—The objects of these improvements in door-bell mechanism are to provide for winding up the main-spring of a door-bell by the operation of opening the door, and at the same time provide for closing the door by a spring, connected with the door-casing at one end, and with a main-spring winding lever at the other end.

1,474.—FITTINGS FOR GATES AND HEAVY DOORS: *J. and T. Griffiths and J. James.*—To remedy the constant dropping of a gate, the upper hinge is made with a ratchet on one of its outer sides, and when the gate "sags," or drops, a notch is taken up. A peculiar fastening is also described, which will permit of the gate being easily opened by a man on horseback. The gates or doors are prevented from winding, and thus last much longer than those of ordinary make.

9,937.—LEAD PIPES: *L. W. Tracy and others.*—The principal feature in the manufacture of lead pipe, according to these improvements, is that the block is arranged directly at the end of a transversely-bored cylinder, thus dispensing with the ordinary die block.

16,765.—WOOD SCREWS: *C. D. Rogers.*—According to this patentee, the rolled screws, instead of having a gimlet point, are made with a plain point unthreaded, but provided with oppositely-arranged screw threads commencing at the base of the tip, extending radially, and forming chisel-shaped or cutting edges, the advantage being that in inserting the screw the unthreaded tip serves to first centre and steady or support the screw laterally, after which the sharp edges of the threads cut their way readily into the wood.

NEW APPLICATIONS FOR PATENTS.

December 22.—20,882. T. Newall and B. Ireland, Raising or Lowering Windows or Doors that work in Slides, at leisure, without the use of Pulleys, Weights, and Cords.

December 23.—20,908, J. Biggs and J. Allen, Flushing Cisterns, &c.—20,948, C. and O. Wernaer, Artificial Granite and Marble.—20,992, G. Jones, Electric Bells.

December 24.—21,021, H. Smart, Regulating Apparatus for Ventilating Shafts.—21,035, D. McKellar, Bench Stop.—21,041, E. Allen, Construction of Large Buildings for Exhibitions, Stores, Barracks, &c.

December 27.—21,072, E. Arthur, Glaze or Enamel for Tiles, Bricks, &c.—21,087, J. Sepulchre, Regulating the Draught of Fireplaces and Stoves.—21,120, J. Longworth, Closing, Latching, and Opening Doors.

December 29.—21,150, H. Haes, Levelling Staves.—21,169, J. Hancock, Chimney Cap and Ventilator.

December 30.—21,187, S. Burlingham, Machinery for Pressing Bricks, Tiles, &c.—21,191, E. Allen, Construction of Portable Buildings and Fixing same.—21,192, E. Allen, Concrete Buildings, &c.—21,210, A. Boult, Carving or Cutting Machines.

December 31.—21,265. J. Houston and J. Colville, Automatic Smoke Cowl.—21,276, J. McGlashan, Preventing Down-draught in Chimneys, Ventilators, &c.—21,278, E. Nutzinger, Asphalte Pavements and Coverings.

PROVISIONAL SPECIFICATIONS ACCEPTED.

17,839, J. Machale, Anti-fouling Paint and Preservative Composition.—17,902, J. Leather, Ventilating.—19,213, R. Batey, Norfolk and Suffolk Latches, &c.—19,836, J. Beddow, Reversible Locks and Latches for doors and gates.—20,477, P. Lawrence, Producing Ornamental Effects or Designs in Wood, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

579, W. Reynor, Staunching Defective House-drains without taking up floors or opening ground in basement.—2,941, G. Appiani, Kilns.—8,237, T. Jones, Dispensing with the use of Sash Lines and the ordinary Sash Fastener.—11,346, R. Curry and others, Joining Water, Gas, and other Pipes.—18,459, C. Haenaler, Fire and Weather Proof Roofing.—19,141, W. Thompson, Door Hinges.—19,154, J. Bardsley, Door Spring and Check.—19,192, G. Spring, Sash Holders.

SUMMARY OF SALES AT THE MART IN 1890.

THE return of sales of real estate, &c., as recently reported by the Estate Exchange for the year ending the 31st ult., is 4,287,111*l.*, as compared with 4,304,954*l.* for the year 1889, thus showing a decrease of 17,843*l.*, and also a falling off as regards the year 1883, when the amount registered was 4,447,340*l.*

We have carefully analysed the reports as published in the columns of this paper each week, and find that the properties sold during the past year were divided and realised as under:—

	£.
1,188 Freehold houses in the London Postal Districts	700,510
52 Copyhold ditto ditto	30,010
3,398 Leasehold ditto ditto	1,101,345
533 Freehold houses outside the Postal Districts	227,108
30 Copyhold ditto ditto	24,770
144 Leasehold ditto ditto	45,318
Freehold ground-rents of 9,476*l.* 9s. 8d. in the Postal Districts	283,096
Copyhold ditto 90*l.* 0s. 0d. ditto	1,800
Leasehold ditto 7,604*l.* 13s. 6d.	110,297
Freehold ditto 2,785*l.* 16s. 6d. outside the Postal Districts	79,560
Leasehold ditto 162*l.* 1s. 8d. ditto	2,140
Enclosures of freehold land 99,512a. 2r. 25p...	1,202,740
Enclosures of copyhold land 427a 2r. 27p. ..	29,070
Freehold building sites, with areas of 110,204 sup. ft.	27,115
220 freehold building plots	28,096
Three copyhold building plots	155
One brewery	20,000
53 public and beer houses	73,080
One music-hall	27,100
Freehold and leasehold wharves	12,400
Foreign estates of 13,626 acres	90,315
Reversions	33,146
Shares	101,505
Policies for 31,837*l.* 15s.	16,027
Rent charges, chief rents, and fee-farm rents of 655*l.* 6s. 1d.	16,483
Advowsons	1,330
Annuities	550
Goodwill and plant	90
Box in the Albert Hall	175
Fishing rights	1,680
Spring of water	800
Total	£4,287,111

Referring to the statistics for the year 1889, as published in our columns on January 11 last, we find that there is a falling off in 1890 in the amount realised for both freehold houses and ground-rents, but an increase is shown on the sale of similar properties of leasehold tenure; landed property also showing an improvement, although the average is not so high as in 1890, when land averaged over 50*l.* per acre, as compared with about 41*l.* per acre for the past year.

There has also been a falling off in the letting of building sites, as only 10,339 superficial feet were let by auction, realising 2,412*l.* per annum.—*Estates Gazette.*

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Greenheart, B.G. ..... ton	6 15 0	7 5 0
Teak, E.I. ..... load	10 0 0	13 0 0
Sequoia, U.S. ..... foot cube	0 2 8	0 3 0
Ash, Canada ..... load	2 10 0	4 5 0
Birch ,, ... fathom	2 5 0	4 5 0
Elm ,, ...	3 10 0	4 15 0
Fir, Dantsic, &c.	2 0 0	3 15 0
Oak ,, ...	2 10 0	4 10 0
Canada	4 17 6	6 10 0
Pine, Canada red	2 10 0	3 10 0
,, yellow	2 0 0	3 10 0
Lath, Dantsic ..... fathom	5 0 0	6 0 0
St. Petersburg	5 0 0	7 0 0
Deals, Finland, 2nd & 1st. std. 100	7 10 0	10 0 0
,, ,, 4th and 3rd	7 0 0	7 5 0
Riga	6 0 0	8 0 0
St. Petersburg, 1st yellow	9 10 0	14 10 0
,, 2nd ,, ...	9 0 0	9 10 0
,, white ,, ...	7 0 0	10 0 0
Swedish	7 0 0	15 10 0
White Sea	8 0 0	17 0 0
Canada, Pine, 1st	18 0 0	24 0 0
,, ,, 2nd	9 0 0	16 0 0
,, ,, 3rd, &c.	7 0 0	10 0 0
,, Spruce, 1st	8 10 0	10 10 0
,, ,, 3rd and 2nd ..	6 10 0	8 0 0
New Brunswick, &c.	5 10 0	7 10 0
Battens, all kinds	4 10 0	15 10 0
Flooring Boards, sq., 1 in., prepared, First	0 10 0	0 14 0
Second	0 8 0	0 10 6
Other qualities	0 5 6	0 7 9

TIMBER (*continued*).	£. s. d.	£. s. d.
Cedar, Cuba ..... foot	0 0 4	0 0 5
Honduras, &c.	0 0 3½	0 0 4½
Mahogany, Cuba	0 0 4½	0 0 6½
St. Domingo, cargo average ..	0 0 4½	0 0 6½
Mexican ,, ...	0 0 4½	0 0 5½
Tobasco ,, ...	0 0 5½	0 0 6½
Honduras ,, ...	0 0 5½	0 0 6½
Box, Turkey ..... ton	4 0 0	13 0 0
Rose, Rio	12 0 0	19 0 0
Bahia	10 0 0	18 0 0
Satin, St. Domingo ..... foot	0 0 9	0 1 3
Porto Rico	0 0 10	0 1 6
Walnut, Italian	0 0 4	0 0 7

METALS.		
IRON—Bar, Welsh, in London tn	6 10 0	6 17 6
,, ,, at works in Wales	6 0 0	6 10 0
,, Staffordshire, in London..	7 0 0	8 0 0
COPPER—British, cake and ingot	67 0 0	68 0 0
Best selected	69 0 0	69 0 0
Sheets, strong	66 0 0	0 0 0
Chili, bars	63 0 0	0 0 0
YELLOW METAL ..... lb.	0 0 6¾	0 0 6¾
LEAD—Pig, Spanish ..... ton	12 17 6	13 0 0
English, com. brands	13 2 6	13 5 0
Sheet, English, 3 lbs. per square foot and upwards....	15 0 0	15 5 0
Pipe	16 10 0	0 0 0
ZINC—English sheet ..... ton	27 0 0	27 10 0
TIN—Straits	90 15 0	0 0 0
Australian	90 15 0	0 0 0
English Ingots	0 0 0	0 0 0

OILS.		
Linseed ..... ton	21 10 0	21 17 6
Cocoanut, Cochin	33 10 0	34 0 0
,, Ceylon	29 0 0	0 0 0
Palm, Lagos	26 0 0	26 10 0
Rapeseed, English pale	28 5 0	0 0 0
,, brown	26 15 0	0 0 0
Cottonseed, refined	18 0 0	18 5 0
Tallow and Oleine	21 0 0	40 0 0
Lubricating, U.S.	6 0 0	7 0 0
,, refined	7 10 0	12 0 0
TAR—Stockholm ..... barrel	1 1 0	0 0 0
Archangel	0 14 0	0 0 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BERE REGIS.—For the erection of pair of labourers' cottages, at Bere Regis, Dorset, for Mr. C. H. E. Ed. Drew. Mr. W. Watts Fooks, architect and surveyor, Wareham.

Green	£440 Beer, Wareham* £345
Hobbs	374 * Accepted

BOURNEMOUTH.—For the erection of [illegible] for conservative scheme extension for the Corporation of Bournemouth. Mr. H. W. Davey, Borough Engineer, Quay Chambers, Poole.

F. Howell	£2,532 6 5
Stanley Cole and Co.	The Shoreham Brick and Tile Co. 2,436 10 2
Cornelius Grove, & Co.	2,734 11 8 Cox, Cross & Co., Limited, Basingstoke 2,436 10 2
Dorset Iron Foundry Co.	2,587 0 0 Cottam & Co., Limited (accepted) 2,436 10 2
Wood & Co.	2,750 16 4

For Schools at Lytchett Minster.

Stanley Cole and Iron Co.	£296 2 0
F. Howell	287 9 0
Dorset Iron Foundry Co.	286 0 0
Cochrane, Grove, & Co.	276 12 0
Wood & Co.	270 16 4

For the Supply of Pipes, &c., for Alum Chine Road.

Stanley Cole and Iron Co.	£1,049 12
F. Howell	1,005 18 10
Farnstone Bros.	1,178 0 0
Cochrane, Grove, & Co.	1,176 2 11
Wood & Co.	1,067 — 6

Stephen Brown Bros. Co. £1,049 12 17
J. Cooke & Co. (London), Limited (accepted) 923 11 11
Cochrane, Grove, & Co. (Limited) 1,176 2 11
Wood & Co. ..... 1,067 — 6
Clay Cross Co. (Limited) 1,049 12 17
J. & L. Roberts, Ltd. ..... 921 1 — [illegible]

BOURNEMOUTH.—For carrying out alterations and [illegible] new buildings at West Yard, for the Bournemouth Town Council. Mr. F. W. Lacey, surveyor, Town Hall, Bournemouth.

Reed Bros., Ltd.	£1,295 0 Hayward, Bros. & Co. £1,298 12
F. Hall & Son	1,290 0 J. W. Laws, Bexhill ..... [illegible]
Jas. White	1,410 0 [illegible] mouth (accepted) 1,298 0

BRISTOL.—For the erection of a villa residence at Mount's Hill, Kingswood. Messrs. Clouttman & Smith, surveyors, Somerset-chambers, Corn-street, Bristol. Quantities by the surveyors:—

S. Turner	£880 C. & F. H. £810
S. Williams	[illegible] W. G. Jeffries, Kingswood* 782
T. T. Smith	682 J. & C. Whitelaw 780

* Accepted.

CHESHAM.—For the erection of two villa residences on the Stanley Avenue Estate, Chesham, Bucks. Mr. Geo. H. Green, architect and surveyor, Chesham.

W. [illegible]reenside, Chesham (accepted)* ..	£1,200 0 0

CHESHAM.—For the erection of new road, kerbing, channelling, sewering, and other works on the Stanley-avenue Estate, Chesham, Bucks. Mr. Geo. H. Green, surveyor, Chesham.

Geo. Capper	£750 J. Morecroft, Wycombe* £680
A. Mead	700 * Accepted.

CWMBRAN.—For road-making, building chapel, entrance gates, boundary walls at the Cemetery, for the Llantarnam Local Board. Mr. B. Lawrence, architect, Austin Friars-chambers, Quantities, Mr. C. Miles, Newport, Mon.

J. Jones Dawes	£1,868 0 0
J. Jenkins, Chepstow and Newport*	1,680 0 0

*Accepted for building, and roads.

GREENWICH.—For alterations to Blue Coat School, Greenwich, S.E. Mr. Thomas Dinwiddy, architect, Greenwich.

Hocking	£345 Kennard Bros.* £295
Long	316 * Accepted

HARROW.—For building house at Harrow, for Mr. E. Wintle, of Weymouth-street, W.

Alaway Bros. (accepted)	£350 0 0

LEICESTER.—For alterations and additions to Messrs. I. Mason & Co.'s Stone-crushing Engineering Works, Brandon-street, Leicester. Mr. H. Stockton Judd, architect and surveyor, 3, New-street, Leicester. Quantities by the architect:—

Bricklayers, &c.

T. Johnson	£345 0 0	W. G. Harrison ..	£287 15 0
Duxbury & Son	339 0 0	A. Plant	285 0 0
T. C. Tyers	317 0 0	T. Bland & Sons	285 0 0
B. Lenk	314 13 0	T. R. Tebbitt*	283 0 0
C. E. Richardson	300 0 0		

* Accepted.

LEICESTER.—For alterations to premises in High-street, Leicester, for Messrs. Foster Brothers. Mr. H. Stockton Judd, architect and surveyor, 8 New-street, Leicester. Quantities by the architect:—

Bricklayers, &c.

T. & H. Herbert	£440 0	T. C. Eyers	£273 0
Dunkley & Son	430 0	C. E. R. Harris & Son	284 15
T. Bland & Son	389 15	A. Pratt*	264 0
T. R. Tebbutt	370 0	* Accepted.	

Ironfounders.

Ashwell & Co	£234 0	Goodwin, Barsby & Co.	£205 0
W. W. Judd	219 19	Gimson & Co. (accepted)	205 0

Plumbers.

Norman & Underwood	£171 14 0

LISCARD (Birkenhead).—For the erection of an ornamental boundary fence and entrance gates for new park, for the Wallasey Local Board. Mr. A. Salmon, Surveyor to the Board, Public Offices, Egremont, Cheshire:—

J. W. Wilson, New Brighton (accepted)	£4,400 0 0

LIVERPOOL.—For new stables, &c., Cropper street, for Messrs. Lewis's, Ranelagh-street. Mr. Walter W. Thomas, architect, 25, Lord-street, Liverpool:—

Avrie	£2,477	J. & G. Chappell	£1,997
Hughes & Sterling	2,280	James Sanders	1,975
W. Thornton & Sons	2,184	W. Tomkinson & Sons	1,969
Roberts & Rowlands	2,100	James Hughes	1,963
Samuel Webster	2,020	Isaac Dilworth	1,910
J. Henshaw & Sons	1,999		

LONDON.—For the erection of a new Police Station at Barnes, for the Receiver for the Metropolitan Police District. Mr. John Butler, Architect. Quantities by Mr. W. H. Thurgood:—

Avins	£4,590	Patman & Fotheringham	£4,396
Thompson	4,586	J. T. Chappell	4,390
Higgs & Hill	4,484	J. & J. Greenwood	4,347
Colls	4,469	Ansell	4,300
Garlick & Hart	4,430	Smith & Sons	4,291
Grover & Son	4,417	Scrivener	4,256
Nightingale	4,410	Atkinson	4,198
Burt	4,397	Lathey Bros.	4,047

LONDON.—For alterations and repairs, No. 1, Wakefield-street, Soho, for Mr. G. Hart. Mr. H. Wakefield, architect, 17, Stockwell-road, S.W.:—

Reed & Son	£1,710 0 0	W. Watson*	£1,079 0 0
Lathey Bros	1,187 0 0	* Accepted.	

LONDON.—For alterations and additions at "The Princess of Wales," York-road, Wandsworth, for Mr. H. Dearling. Mr. G. Treacher, architect. Quantities not supplied:—

B. Stone	£1,816 0 0	Moore & Son	£1,347 0 0
Burman & Son	1,500 0 0	J. Beale	1,340 0 0
Hemsell	1,414 0 0	S. & L. W. Ransom	1,276 0 0

LONDON.—For the erection of All Saints Vicarage, Kensington-park, for the Rev. Canon Teacher. Mr. E. P. Loftus Brock, F.S.A., architect:—

E. Cutler & Sons	£2,850 0 0	Mattock Bros.	£2,677 0 0
B. E. Nightingale	2,750 0 0	Pozzey & Lumley	2,780 0 0
J. C. Bennett & Co.	2,650 0 0	J. Allen & Sons	2,675 0 0
W. Johnson	2,544 0 0	P. Peters (late)	2,655 0 0

LONDON.—For rebuilding Stratford, and alterations to leather factory and warehouse, at Radford road, Rotherhithe, S.E. Mr. Fred. G. Grierson, architect, 9, Old Jewry-chambers, Cheapside, E.C.:—

J. Peasle	£983	Mattock Bros.	£833
H. H. Hedgeland	898	Courtley & Dallaway	747
C. Atwell	782	* Accepted.	

Contract and Ironwork
Rowmson, Drew, & Co. (accepted).
[No competition.]

LONDON.—For the rebuilding of the printing works of Messrs. Ford, Shapland, & Co., Nos. 26 and 27, Whetstone-park, Lincoln's-inn-fields. Mr. H. Huntly Gordon, architect, 123, Cannon-street, E.C.:—

Perry & Co.	£1,654	Wm. Shurmur	£1,740
F. & H. F. Higgs	1,850	E. Jones	1,738
Wm. Brass	1,836	E. Lawrence & Son	1,652
Falkner	1,804	W. & F. Crocker*	1,632
D. Charteris	1,732	* Accepted.	

LONDON.—For the re-building of No. 13, Bateman-street, Soho, and forming weekly tenements and shop premises. Mr. H. Huntly-Gordon, 123, Cannon-street, E.C., architect:—

E. Jones	£1,589	W. Shurmur	£1,395
J. W. Falkner	1,499	Kirly & Chase	1,350
F. & H. F. Higgs	1,480	Wm. Sprycer & Co.	1,346
D. Charteris	1,475	W. & F. Crocker*	1,243
E. Lawrence & Sons	1,400	* Accepted.	

MOLD (North Wales).—For taking out old plant and machinery and refitting with new, and alterations to Brewery, High-street, Mold, for Messrs. D. C. Radcliffe & Co. Mr. Walter W. Thomas, architect, 25, Lord-street, Liverpool:—

Ellis Marsden, Liverpool	£1,110 0 0

SUTTON-IN-ASHFIELD.—For providing temporary pumping plant and executing certain works to augment the water supply by one million gallons per day, for the Local Board. Mr. Geo. Hodson, engineer, Abbey-buildings, Westminster, London, S.W.:—

Docwra & Son	£6,411 0 0	H. Bowman	£3,299 1 7½
Tilley & Son	3,852 1 8	Price & Standlow	2,934 0 0
Fotheringby & Son	2,599 10 0	H. Vickers, Nottingham (accepted)	1,950 0 0
J. Tomlinson	2,475 0 0		

WALLASEY.—For sewering and making promenade, with other relative works, for the Wallasey Local Board. Mr. A. Salmon, Surveyor, Public Offices, Egremont, Cheshire:—

A. Bleakley, Birkenhead (accepted)	£6,397 18 4

WARLINGHAM.—For the erection of a new country house at Westhall, Surrey, for Mr. James Lind. Messrs. Gordon, architect, 123, Cannon-street, E.C.:—

T. & J. Ward, Warlingham	£1,750 0 0
[No competition.]	

WARLINGHAM.—For the erection of stabling and gardener's cottage at Westhall, Surrey. Mr. H. Huntly-Gordon, architect, 123, Cannon street, E.C.:—

T. & J. Ward	£750 [Charles Rice, East Grinstead £625

WEST BURTON.—For building a covered service reservoir to hold about 6,250 gallons and for the construction of an earthenware conduit about 550 yards in length, and cast-iron pipes, for the Aysgarth Union Rural Sanitary Authority. Messrs. Rodwell & Son, engineers, Keld Head Office, Wensley, Yorks:—

Thos. Armstrong & Chris. Bushby, West Witton and Preston (accepted)	£414

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"A Competitor" (should have enclosed name and address. We cannot act upon anonymous communications).—W. S. (of course to such ceiling would be passed by a District Surveyor in the case of a public building. The difference depends on the construction of the floor above. If this is a solid fire-proof floor of brick or concrete, the danger in case of fire is not so great; if it is a timber floor, with ordinary boarding, the whole may be said to be a preparation for a bonfire).—P. W. R. (should have sent amounts).—J. D. (ditto).—Messrs. B. (ditto).—J. H. (ditto).—F. M. & Co. (too late for this week).—C. L. & Co. (ditto.)—J. H. (ditto).—Messrs. B. G. & S. & Co. (ditto).

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The Builder.

Vol. LX. No. 2502. Saturday, Jan. 17, 1891.

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Thessalonica and the Recent Fire.

THESSALONICA is to-day one of the most interesting cities in the East of Europe, as it has always been one of the most important. Its position at the head of the Thermaic Gulf, the natural outlet for all the country lying to the north between it and the Danube, makes its great strategic value unquestioned, and its possession has always been contended for as commanding the key to the whole of Macedonia. In Roman times the great highway from the Adriatic to Byzantium, the Via Egnatia, passed through the centre of the town, and its course is still identified in the main street of the modern city. So great is its importance to-day that its future destinies hang in the balance; and, in the event of complications in the East or the dismemberment of European Turkey, its possession will be competed for with almost as much zest as for Constantinople itself.

Its position it also one of great natural beauty, stretching up from the water's edge, enclosed by its old walls, and dominated and overshadowed by the old Byzantine fortress of the seven towers. From the sea it appears a city of tall minarets and white, red-roofed houses rising tier over tier on the sloping hill-face, embedded amongst gardens and green trees. This hillside is to-day the Turkish quarter; here the streets are green and hushed and quiet, the houses all closely shut in, and the windows screened off from the vulgar gaze by those lattice blinds of thin laths which one always finds in Mahommedan cities. Lower down on the flat land near the sea, the Jews and Greeks congregate, and there is the centre of busy life, the bazaars with their rows of covered booths, their tortuous alleys, and the unending stream of everchanging humanity of many races and religions. The streets of this quarter are probably more picturesque in their variety of type of character and costume than those of any other European city. The population is about two-thirds Jews, whose ancestors were expelled from Spain by the Inquisition during the reign of Ferdinand and Isabella, and who found an asylum here, where they have been free to exercise their religion undisturbed, under the rule of the Mussulman, from that day till now. They speak to-day the same language they brought with them, a variety of old Spanish, which they write in the Hebrew character, and they still retain their traditional costume, the men in their long, fur-lined coats of various hues, the women in their quaint and striking headdresses and daintily-contrived bodices. Side by side with them mingle the grave and stately Turks fezed and turbaned, in loose trousers and gay sash and jacket, or more soberly clad in black frock-coat and trousers of European cut, their women veiled and hooded, and neatly dressed in robes of simple colours; and the wily Greeks intent on turning a piastre to most account. The Greek is said to be equal to two Jews in craftiness. In Athens the Jew finds it impossible to thrive. The Greeks, however, form now but a small fraction of the population in this the second city of the old Byzantine Empire. Rubbing shoulders with them one sees the horny-handed, bronzed Bulgarian or Wallachian peasantry from the outlying country districts, who bring in their produce to the town for sale on horse or donkey, and the sailor from all corners of the Levant and Mediterranean. Each religion observes its own Holyday, so that in point of fact there are three Sundays in Salonica in every week, but Saturday is the great feast-day, and in the bright weather the broad quay extending along the water-side from one end of the town to the other, and which took the place some seventeen or eighteen years ago of the old sea-wall of defence, is crowded with moving life and the streets and bazaars are comparatively deserted. From here across the gulf the great range of Olympus is in full view between forty and fifty miles distant.

As in most Eastern cities, each trade has its own quarter of the town; in one street you hear the hammering of the worker in brass and the kettle-maker, in another there is nothing but silversmiths' shops; here the carpenter plies his calling, there are the shoemakers and the tailors, and at every corner the money-changer sits before his desk and seems to do a good business.

One autumn morning last year a brief telegram in the daily newspaper announced that Salonica was in flames, that the Church of Saint Sophia, built by Justinian, the former metropolitan church of the Greeks, was destroyed; that other Byzantine churches were damaged, a large part of the town already burnt, and the fire still going on. For a long time authentic information regarding the extent of the fire and the damage actually done was unobtainable, and even now we do not know of any description giving accurate details. We have, therefore, the less hesitation in placing the following facts before our readers.

The fire occurred in the most populous part of the town, lying between the main street and the sea, towards the east end. This district was closely packed with houses belonging to the poorer classes. It broke out on the evening of a Bulgarian feast day, and political motives were at once attributed as the cause, but it seems that it originated in a light wooden building used as a still, and through the overturning of a vessel containing spirit. The wind was blowing towards the sea, otherwise the whole town might have been consumed.

Afterwards, when the extent of the damage came to be examined, it was found that several thousands of families, mostly Jews, had been rendered homeless, and, in many cases, destitute. A large corner of the town, perhaps a sixth part, was in ruins, and two Consulates, the Greek and the British, which both stood facing the sea, were destroyed. The Greek Metropolitan Church and the Archbishop's house, we cannot dignify it by the name of palace, were also consumed in the flames, and several other buildings belonging to the Greek community which had its headquarters in this part of the town also perished. These buildings, which were of comparatively late date and of no architectural pretension or value are, we believe, to be replaced, through the liberality of a wealthy Greek banker of Athens, M. Syngros, to whose patriotism Athens is indebted for some of her new public buildings, and Olympia for her new museum.

Army tents were requisitioned for the temporary shelter of the homeless families, and a camp was formed in the outskirts of the town,—a veritable case of "Israel in his tents."

The subscriptions received from all parts of Europe in answer to the appeal for help have made the reconstruction of this part of the town in a more substantial form a possibility, but things move slowly in the East, and it is quite possible that this work has not yet been commenced.

In the Metropolitan Church perished a fine carved wood Iconostasis, on which the Greeks set great store. They assert that it had been removed from St. Sophia when the Turks took possession of that church, and converted it into a mosque about the year 1489. If so, it must have been put there after Sultan Amurath conquered the city in 1430, as tradition says, that the victorious Turkish soldiers pillaged all the churches, and broke or removed all the treasures and objects of art of which the Iconostasis was always one, being generally inlaid with gems and precious stones. But a matter for much greater regret is the loss of the records of the Greek Church, which are said to have dated back from before the Turkish Conquest, and which had all been stored here. With them had perished for ever valuable information regarding the history of the town. Little was known about these documents, as they were jealously guarded, and various Christian archæologists had tried to get access to them without success. All the episcopal vestments and the church vessels were also destroyed, as well as the body of a minor saint, whose remains were preserved here with great reverence, and formed a source of revenue to the church. Probably, however, some relics of him have been recovered, as a resident in the town tells a story of how he was walking round the ruins a few days after the fire, and came across two or three Greek priests digging on the site, and with a doctor in attendance to certify which of the charred fragments they were unearthing were bones and which were not. The pity of it is that the records might have been saved, and perhaps the saint also, as there was sufficient time before the fire reached the church to have removed them all to a place of safety, but the Archbishop, instead of taking practical measures for their preservation, preferred to trust to Saint Demetrius, the patron of the town, who, however, again forsook them, as he had done previously when they relied on his protection during the siege by the Saracens in the tenth century, and again before the Turkish conquest in the fifteenth; although he had formerly, according to an old chronicle, miraculously preserved the city from the barbarians in the seventh century.

Salonika, like so many Turkish cities, is largely built of wood, and fires have been of frequent occurrence from time to time; but since the fire insurance companies began to do business in the town, it is said that they have increased both in number and frequency. The insurance companies have provided fire-extinguishing apparatus, but, from one cause or another, whether want of water or want of knowledge of how to use it, it generally does very little practical good.

The church of Saint Sophia is situated near to the spot where the fire originated. It stands in a large open space, but that fact did not save it from damage. The people, looking upon the building with its thick walls and arches as virtually fireproof, had brought hither the things they were able to rescue from the houses close by, and had strewn them about all over the floor in the interior of the building, forgetting that the windows of the dome were unglazed.

Showers of sparks blown by the wind fell through these windows on to the easily ignited household gods, and the result was soon a burning mass which speedily spread to the collection of the Turkish archives of the town, which for greater security from fire had been kept stored in the small chamber to the south of the bema, and alongside of them, in the south aisle, the records of the property of the mosque itself. This large accumulation of paper burned fiercely for some time, and loosened all the plaster from the walls and vaults, and destroyed the wooden window frames. Unfortunately, although the walls and arches were stout and withstood the heat, it cracked and split the beautiful verde antique pillars which divide the area of the church from the aisles, and ruined the magnificent carved capitals with their wind-blown leaves, which resemble those in S. Apollinare in Classe, at Ravenna, but are much finer. On the north side of the church, where there was very little débris, the pillars and capitals have been spared. The mosaics of the dome have been blackened by the smoke, but otherwise we believe they are uninjured.

This, however, was not the only damage done; the roofs of the galleries which extend over the narthex and side aisles were of wood covered with lead. These roofs, which were probably Turkish work, were soon a prey to the flames, and the falling beams and the heat combined seriously injured the smaller marble pillars with carved capitals which divided this part of the church from the central area. The open Turkish porch, stretching across the west end of the building, also suffered, and the sparks reaching to the top of the very high minaret adjoining set on fire its steep conical roof.

It is a matter for great satisfaction that the building has not been seriously injured structurally, and that it is capable of substantial repair, and we understand a movement is on foot to try and so far influence the Turks as to get them to have the restoration of this most important architectural monument of the finest epoch of Byzantine construction proceeded with with all due caution, and in such a way as not to injure or destroy anything of archæological or historical interest. This is all the more necessary as they have recently spent a good sum of money in restoring the Church of St. George, known as the Rotunda, and have done it in such a way as to obliterate and obscure a great deal of important and interesting data that was formerly apparent, and have for ever ruined the archæological value of its most unique mosaics.

But of this and of the other churches in the town, which have happily yet once more escaped destruction, we hope to have more to say in the near future, when we trust to be able to publish more in detail short descriptions of the various objects of interest, both of Roman and Christian times, in this the most notable city, after Constantinople, of the Eastern Empire.

STUDENTS' DESIGNS AT THE INSTITUTE.

THE drawings sent in competition for the various prizes offered by the Institute have been hung in one of the galleries at the rooms at Conduit-street. The most satisfactory works this year are those submitted in competition for the Pugin and Owen Jones travelling studentship for the present year, and those executed by the successful competitors for these two studentships last year. The Soane Medallion has not been awarded, though the Council have consented to divide the £60 usually connected with it between two of the competitors, on certain conditions, with a view we presume of giving them an incentive to improvement and putting them in the way of fairly winning the medallion another year. The Godwin Bursary has also been withheld, the candidate for it not having satisfied the conditions.

The subject for the Tite prize was a staircase for a large mansion, and the design to which the prize has been awarded, though rather slightly drawn, is in character one of the best and most suitable sets of drawings we have seen submitted for this prize. The author, Mr. A. Mackintosh, has adopted the principal of a lower central flight of steps and a return each way, arranged in a square space covered by a low elliptical dome, and surrounded at the upper level by a wide corridor with an arcade carried by coupled columns in contiguous pairs, opposite to which on the side walls of the corridors are niches with statues. The treatment of the detail is florid but not unsuitable to the staircase of a sumptuous mansion. The author appears to have been a good deal indebted to existing sculptural design for putting in his figures; we recognise Mr. Onslow Ford in one of the niches, and Flaxman in one of the lunettes of the dome; but copying good figures is at all events good practice. The design is quite the best of the three submitted, the others, though carefully and neatly drawn, being somewhat commonplace and devoid of freedom in treatment.

The subject for the Soane Medallion was a Technical School; we are not aware what extent of special instructions were issued with it, but some must have been issued, as the provisions in all the plans appear to be much the same. As before observed, the Council have withheld the medallion, and a cursory glance at the drawings is sufficient to show that they were justified in doing so. To the authors of the designs "Fortuna Sequatur" (Mr. A. W. Hoskings) and "Anon" (Mr. Arthur Jemmett) the Council have awarded 25*l.* each for foreign travel under certain conditions. Mr. Hoskings is a Colonial student from Sydney. From what we see of illustrations of Australian architecture from time to time, much cannot yet be expected from Colonial training, in the way of art at all events; and the "Fortuna Sequatur" design is a heavy and clumsy-looking piece of neo-Greek work which we cannot admire at all. That of "Anon" is a building in what may be called a respectable style of Renaissance, quite unobjectionable, but not very interesting. The plans of both are good, though in "Fortuna Sequatur" lighting of class-rooms seems to come rather too much from all quarters without reference to aspect or direction of seating. Still, we presume plan has had something to do with the selection, with which on the whole we must concur. There is more originality of design and colouring in the rather heavy perspective view of "Ignis Fatuus," and there is much picturesqueness in the Gothic exterior of "Crafts," who we understand was disqualified for not having sent a basement plan; which was required by the conditions, but who surely must have been disqualified in any case by some features of his plan, for instance the internal buttresses on the ground-floor shutting out so much light from the class-rooms, and the shape of the lecture-hall, a long narrow avenue. However, the author is to be congratulated on the picturesque character of an exterior which has nothing to do with the object of the building. The perspective of a Georgian building, in red brick and light-coloured stone, under the motto "Dum Spiro Spero," is very good of its kind, showing refinement in detail and some breadth of treatment.

Mr. Greenslade's drawings for the Pugin Studentship, which he has well earned, are a most satisfactory set. He works in pencil on smooth paper with a very firm decisive touch and with much artistic feeling for effect. Among the best drawings are those of capitals from Wells and Worcester, an admirable perspective drawing of a portion of the interior of Exeter (we have never seen a bit of vaulting drawn better than this), the monument of Gasparo Moro at Venice, &c. A medal of merit has been awarded to Mr. Detmar J. Blow, whose water-colour sketches show very artistic feeling, while he gives a large-scale and useful set of measured drawings of one bay of Beauvais. The drawings of last year's Pugin student, Mr. Begg, are very numerous and perhaps not so effective as his competitive drawings would have led us to expect, but include a great deal of interesting work, mostly English Gothic from country churches: a list of them is given on another page. The large ink drawings submitted by Mr. Percival, which look rather like magnified sketches, are effective and clever in a way, but rather sensational and showy in style. Mr. A. H. Hart shows a large amount of work not in the best style of drawing, but giving proof of a good deal of industry. The pencil

details and the geometrical section of a music school at Malines are the best, and also a rather slight but very pleasing pencil sketch in the quadrangle of Jesus College.

The successful competitor for the Owen Jones studentship is Mr. F. W. Bedford, who has submitted a beautiful collection of drawings. The coloured drawings of a Renaissance ceiling from Siena, of a metal screen at Jerez, in Spain, and the doorway of a mosque at Cordova, are admirable, the last-named especially in which both colour and texture are beautifully rendered. His pencil drawings are also very delicate and refined. But the general level of the drawings for the Owen Jones Studentship is very high, as the Council have recognised by awarding two medals of merit, one to Mr. A. N. Prentice, accompanied by ten guineas, another to Mr. F. Masey, accompanied by five guineas. The best of Mr. Prentice's drawings are the coloured geometrical ones, the gate at San Pablo, the doorway in the Alcazar, the elevation of the convent of San Marcos at Leon, the coloured section of the Alcazar, and the doorway of mosque at Cordova. In this class of drawings Mr. Prentice runs the successful candidate very close, though he does not equal him. His partially-tinted pencil drawings of two Renaissance monuments are rather scribbly in detail, and not so good as the subjects were worth. Mr. H. Wilson's drawings submitted for the same competition are very good, but not so much to the purpose of the competition, as they are remarkable for free and effective handling of water-colour in views of buildings rather than for representation of colour design. The last year's Owen Jones student, Mr. Lanchester, exhibits a very large collection of work executed in pursuance of the objects of the studentship, of which a list is given elsewhere; they include a great deal of geometrical drawing of coloured work, and a number of picturesque water-colour sketches chiefly in Spain, perhaps a little too yellow in prevailing tint; but one, the fountain of Charles V. at the Alhambra, gives the effect of hot sunshine on road and buildings exceedingly well.

The silver medal for measured drawings of a building has been awarded to Mr. H. Rimmer for a very good set of drawings of Compton Wynyates; not effective or showy, but very carefully done and in a good style of drawing. Mr. Blow has a medal of merit in this competition also for his drawings of Barfreston Church, of which the large-scale drawings of the door and its sculptured ornament, and the full-size pencil-drawings of carved detail, are very well executed. The measured drawings of Llandaff Cathedral signed "Saxon," though in a rather mechanical style of drawing, do the highest credit to the author's industry. "Christchurch," signed "Esse Quam Videri," is a good careful set of drawings; and those of the Beauchamp Chapel, Warwick, signed "Bear and Ragged Staff," evidently from their style by a young hand, are nevertheless commendably neat and careful.

Two sets of drawings only have been sent in for the Grissell medal, the subject for which is an iron roof for a Volunteer drill-shed. Of these the one to which the prize has been awarded is far away the best, and shows very careful study of the details of iron construction. One must regret however, that this practical competition receives such comparatively small support. The comparative failure of the Soane medallion competition for two successive years is also to be regretted. We look on this as the most important competition of all, because it is the only one which represents the complete practice of architecture as the art of invention in design and planning combined, without restriction as to style. The failure of this and the success of the Pugin and Owen Jones competitions goes to show once more the fact, which is much to be regretted, that the student ranks in architecture at present are more eager about mere drawing, and more proficient in it, than in architectural designing in the full sense of the word.

NOTES.

WHATEVER the ultimate result of the Scotch railway strike may be, it is certain that the prolonged stoppage of work will have an appreciable effect upon the dividends of the companies concerned, the decrease of traffic receipts having now reached a very high figure. The "sinews of war" have to be provided by the shareholders, while the strain upon the "loyal" servants of the companies, of all grades, is necessarily very severe. The officials and volunteer assistants are running considerable risks, several having met with accidents,—one, unfortunately, proving fatal. The luckless Bishopton station-master, who was crushed by an overturned engine, died a martyr to the strike; and others,—similarly out of their element,—have narrowly escaped a similar fate. This state of things is naturally regarded by the public with alarm, and by the strikers with something like satisfaction; while it must add very considerably to the anxieties of the management. The latter are as determined as ever not to give way, though not more so than the men,—who daily receive assistance from trades' unions and other sources. The idea of arbitration does not appear to be at all palatable to the strikers,—in fact, a speaker at one of their meetings on Monday, who proposed a resolution in favour of arbitration, was summarily ejected. Both sides have "hardened their hearts" to such a degree that all the efforts of various mediators have, up to the time of writing, proved fruitless. The Lord Provost of Edinburgh seemed to have some prospect of success in this capacity, but the result of his attempt was disappointing. From the last accounts, however, the position of the strikers seems more discouraging, and therefore it is possible that a settlement is not far distant.

FOR some months past we have been conscious, in glancing from time to time at the Australian building papers (an "architectural" journal in the higher sense Australia can hardly be said as yet to possess), of a considerable paper warfare going on about and around the name of Mr. Horbury Hunt. What the rights of the matter were, and what the controversies and recriminations were precisely about, it was not very easy from this side of the globe to make out clearly. But recent information appears to make it clear that Mr. Horbury Hunt has been engaged in endeavours to establish the Institute of Architects of New South Wales on a secure and legally recognised basis; and moreover that he has succeeded, and that the said Institute is now, chiefly through his efforts, duly incorporated, and that he is for the present the President of it. What was the precise status of this Institute before its incorporation we do not know, but we gather that it was a somewhat informal and irregular body, and that it was not calculated to avail much in keeping up a high standard of professional principle and practice. Mr. Horbury Hunt appears to be, as we think he himself admits somewhere in one of his speeches, a "fighting man," and there may, for all we can understand, be something to be said on both sides of the fight; but at all events the tone of Mr. Hunt's presidential address two or three months ago was exceedingly manly and spirited, and leads one to expect that the new start made by the Institute of Architects of New South Wales, under his presidency, will be for the good of the profession in that region, the rather as one is led to think from remarks or correspondence in some of the Australian daily papers, that there was a great deal of room for an improvement in the standard of professional practice. This is not unlikely to be the case in a new country, and one moreover which is still to a certain extent regarded, by those who have been failures in the old world, either from defect of intellectual or moral fibre, as a place where they may try over again; and a professional representative body which will hold up the standard of high and honourable principle with a firm hand will no doubt be a healthy influence, and all the more because it appears to have an energetic and high-minded man as its President. It must not be forgotten, however, that this is only a step in the right way; that the true end of architecture is art, and the true object of an Institute of architecture to advance the art of architecture. It is very right for the Australian architects to set their house in order first; that is the first stage, no doubt; but they have then to decorate it. As far as we have any means of judging, Australian architecture is far enough from that at present.

WE cannot see why it should be assumed that the Railway and Canal Traffic Act will override agreements entered into with the railway companies as to the charges to be made for certain services. Yet this, as in the case of the coal traders of the Gurston district, is not at all uncommon. As we understand it from the statement of the deputation who waited upon Sir Michael Hicks-Beach on Monday last, the London and North-Western Railway Company have entered into a contract with them to haul coal for shipment from the collieries to certain docks at a uniform rate of 1s. 2d. per ton, provided a specified amount of traffic per annum is maintained. The rates now proposed to be legalised would empower the railway company to impose a higher charge; but it is not shown that they have not, at the present time, a right to charge more than 1s. 2d. per ton, and in the face of the agreement referred to it is difficult to believe that they would seek to advance the rate. Possibly they have threatened to do so, but we apprehend that the existence of the agreement would enable the coal-owners to offer a successful resistance without the intervention of the Board of Trade, though they seem to think that they are in danger of losing their special rate through the operation of the Act. There appears to be an impression that the railway companies are going to be compelled to charge up to their new maximum rates; but, while we would not for a moment discourage the efforts which are being made to get these rates pulled down as low as reasonably may be, we cannot but think that there is a good deal of misapprehension as to the intention of the Act.

THE Board of Trade Returns for 1890 show that during the past twelve months our foreign trade in building materials decreased to a considerable extent. The imports (consisting chiefly of wood and timber, and window, sheet, and plate glass) amounted in value last year to only 17,934,008*l.*, against 20,518,700*l.* in 1889, and 15,346,255*l.* in 1888. These totals do not include the imports of building iron (girders, beams, and pillars), of which products of the value of 512,000*l.* entered last year, against 520,212*l.* in 1889, and 387,005*l.* in 1888. The heaviest falling-off was in sawn or split and planed or dressed wood, which declined from 13,142,333*l.* in 1889 to 11,092,221*l.* last year, our chief sources of supply being still Sweden and Norway. On the other hand, there was an increase in the imports of glass, which rose from 692,656*l.* in 1889 to 807,025*l.* in 1890. There was not much change in our exports of building materials. So far as shown, and including cement, painters' colours and materials, and plate glass, their declared value was 3,049,290*l.* in 1890, against 3,033,353*l.* in 1889, and 2,874,056*l.* in 1888. The heaviest item is formed by painters' colours and materials, to the amount of 1,577,080*l.*, compared with 1,558,579*l.* in 1889, and 1,448,189*l.* in 1888. Cement of the value of 1,282,426*l.* was exported last year, against 1,231,649*l.* in 1889, and 1,165,000*l.* in 1888, our principal customers being the United States and Australasia. The returns furnish no particulars as to the exports of builders' hardware and tools used in the building trades, nor of building iron and other

metals used by builders; but as the gross totals of metal exports exhibit an increase in value, if not in quantity, it may be assumed that there was, at any rate, no diminution in the value of exports of that description.

A CORRESPONDENT has sent us the printed conditions of competition for the Montreal Board of Trade Buildings, the designs for which are to be sent in on the 31st of this month. It contains one or two points of interest. The competition is open to all Canadian architects, and six American architects have been invited also to compete. These are Messrs. Rotch & Tilden (Boston); Messrs. Shepley, Rutan, & Coolidge, also of Boston; Messrs. M'Kim, Mead, & White; Mr. G. B. Post; Mr. C. W. Clinton (all of New York); and Messrs. E. A. & W. W. Kent, of New York and Buffalo. The following extract from the conditions is noteworthy for the passage we have pointed out by italics:—

"6. The whole of the designs received to be submitted to the expert without any indication as to who are the authors thereof, and the expert shall be requested to endeavour to grade them in order of merit, and to give, as far as may be practicable, his reasons for such grading. Should the expert's grading leave the committee in doubt as to which of the Canadian architects are entitled to remuneration as provided in Clause 2 of these conditions, then the expert shall be requested to select the best six of the Canadian designs.

7. The committee will, after due consideration of the expert's report upon the designs submitted, *make its own selection, which will be final.*

8. All drawings but those of the selected design will be returned to the authors thereof, so soon as the committee has made its selection, unless permission has been obtained from the authors for their exhibition.

9. The author of the selected plan shall not be paid the 300 dols. therefor, but shall be given the superintendence of the work at the usual rate of compensation for architect's services; but in case it may be deemed desirable to associate with the architect of the selected plan a consulting architect, the committee reserves to itself the right to make such an appointment, and to assign to him a proper proportion of the fees.

In case the work is not proceeded with upon selection of the plan, the architect thereof will be paid one-third of the amount of commission which would be due to him were the work completed, and upon completion of the work, the sum so paid would be deducted from the amount then due."

We call attention to that passage about the Committee "making their own selection" because it shows how such a matter is regarded by others who promote large competitions, and because some English architects appear to entertain the unreasonable idea that the owners of a new building, the people who are to use it and to pay for it, are to be bound to give over the unrestricted choice in the matter to an architectural assessor. We have no doubt that the Montreal committee intend to give every weight to the judgment of their professional adviser; they have selected for this office one of the most distinguished American architects of the day, Mr. Richard M. Hunt, and they declare in so many words that they will "give due consideration" to his report, and in all probability, we imagine, they will act in accordance with it: but they will not bind themselves to accept it. More, we think, cannot be expected by the architectural profession. Another point worth noting is the suggestion made by Mr. Hunt in regard to the preparation of the perspectives, viz.: that "in the perspective drawings the nearest point of the building should be laid out *at* $\frac{1}{8}$ *scale* in the plane of the picture, and the point of view to be 6 ft. above the ground-line."

WRITING to the *Athenæum*, Mr. E. Walford asks:—

"Will any members of the Hellenic Society, or any of your other readers, join with me in a little inexpensive movement to do honour to George Chapman, the poet, and the first translator of Homer into English verse? . . . The monument erected to his memory by Inigo Jones against the southern wall of St. Giles-in-the-Fields sadly needs re-cutting."

The monument referred to stands on the ground near to the church's east end, and has lately been protected by a hood formed of two stone slabs placed at an angle above it. The upper inscription is a copy of the original, except as to the date, which is obviously imperfect, and appears to have been cut upon a fresh slab of stone inserted into the monument that Inigo Jones erected, as he himself says, to his friend. The lettering is in very good state, distinctly legible, and stands thus:—

"GEORGIUS CHAPMAN POËTA MDCXX [*sic*] IGNATIUS JONES ARCHITECTUS REGIUS OB HONOREM BONARUM LITERARUM FAMILIARI SUO HOC MON: D. S. P. F. C."

The concluding initials may signify, perhaps, "*de sua pecunia faciendum curavit.*" Chapman died in 1634, and Inigo Jones in 1652. The base, being 29 in. by 12 in., bears another inscription, in Latin, to the effect that the stone, having long been suffered to fall into decay, was restored by the rector, the Rev. J. E. Tyler, and Messrs. W. Parker and C. L. Birch, churchwardens. Mr. Walford reminds us that Thomas Habington, in his poem of "Castara" (originally published in the year after Chapman's death), refers to the circumstance of Chapman's grave being outside of the church. That, of course, was the old church; the present one, designed by Flitcroft, was opened in April, 1734. The total cost amounted to 10,026*l.* 15s. 9d. The building is often ascribed to Hawksmoor; but Flitcroft's model, his agreement with the trustees for the rebuilding, and other evidence are, or certainly were lately, preserved amongst the parish records.*

THE Central Criminal Courts, the proposed improvements of which we referred to last week, form portion of the Sessions House, formerly known as the Justice Hall, and include the Old and New Courts. The court is described by Stowe, and, somewhat after the fashion of the courts that stood against the walls of Westminster Hall, was quite open towards the large yard; the bench, according to two old views in the Guildhall, being along the southern side. It was rebuilt (in 1773, *teste* Timbs) in pursuance of the scheme for reconstructing the Prison and Sessions House after the designs of George Dance the younger, of which we gave a summary two years ago.† Having been again rebuilt after the attack upon Newgate Prison in 1780 by the "No Popery" rioters, the Sessions House was enlarged in 1809 by the taking in of the site of Surgeons' Hall, which had a frontage of 80 ft. to Old Bailey. In 1758 Goldsmith had a lodging at No. 12, Green Arbour-court, Old Bailey, between Seacoal-lane,—whence it was entered by Breakneck-stairs,—and Little Old Bailey. "Goldsmith offered himself for examination at Surgeons'-hall (the new building erected six years before in the Old Bailey) on the 21st December," as a hospital mate.‡ In Strype's "Survey," 1754, will be found R. Cole's print of the hall's handsome façade, having a central doorway on the first floor, approached by two flights of steps, right and left; the elevation being divided by six Ionic pilasters supporting a cornice, over which is a blank attic, surmounted with urns, to correspond. In 1841 Dr. Reid's plan of ventilation by means of filtered air was adopted for the Courts, the discharge-pipe being fitted with a huge iron cowl, 15 ft. in diameter, and weighing two tons. We are informed that the cowl was destroyed in a fire some years since. Four years ago the Sessions House was enlarged at a cost of 2,100*l.*, by the addition thereto of an adjoining house in Old Bailey. Pope's often-cited couplet, borrowed from Congreve, alludes to the Judges' dining-room that was built over the old Court. The dinners, we understand, are now discontinued. We may add that Old Bailey,—with which compare Old Bayle, York; St. Peter in the Bailey, Oxford; and Bailey-hill, at Radnor and Sheffield—corresponds with the Houndsditch, between Ludgate on the south and Newgate on the north, mentioned by Stow, wherein a tenement was appointed, 1356, to John de Cauntebrigg, Chamberlain of London, and in which the Chamberlains kept their courts for the City of London and shire of Middlesex. That worthy, by his will, devised to Katharine his wife a reversion of the interest in all "that tenement situate in the parish of St. Sepulchre Without Newgate called Bacon's Inn;" and, after her death, Bacon's Inn was to pass to the Abbot and Convent of Burton, county Stafford.

THE last number of *l'Architecture* contains a contribution signed Gaston Rozet on the question of "Le Repos du Dimanche" as affecting building operatives in France. Of course the religious aspect of the question, as it would be considered by many in England, is not touched upon; it is simply a question of justice to the workman whether he should be compelled to cease work on Sundays or not. M. Rozet is against such an idea, and quotes the evidence of a working man who said that he considered it an object to save a little for an occasional Sunday excursion with his wife and family, say once a month; but that if the rest of his Sundays' labour were taken from him he would be unable to make enough to spare for this occasional recreation. The writer concludes—let us leave the working man free to work according to his strength and his inclination; he has already "assez de repos forcés" during the course of the year. This is probably the way the question will be generally regarded in France, both by working men and legislators.

THE *Semaine des Constructeurs* for Jan. 10 contains a complete illustration, in plan, section, and elevation, of the new disinfecting establishment for Paris, planned and designed by M. Bouvard. The site is nearly square, the main building running up the centre with an open yard on each side. On the left is the infected side, where vehicles are driven in and discharged into that side of the building, and their contents are passed through stoves on the centre wall or backbone of the building to the other side, whence they are despatched from the opposite yard. The street front of the building includes a small dwelling-house for the general superintendent.

WE have received a sheet of diagrams of a grate, made by Messrs. Yates, Haywood & Co., and described as Lieutenant-Colonel Plunkett's patent, for barracks, hospitals, and public buildings. It does not appear to possess any quality, in principle, other than what is to be found in grates already known; it is a low grate with a fire-clay back and floor to the grate, an iron chimney back bent somewhat forward or convex in shape, and a chimney with a narrow throat just above the fireplace. The grate comes close down on the hearth. All these characteristics, and their uses, are well known. Air is admitted into the space between the iron back and the wall, and being heated ascends by a separate flue to discharge into the room near the ceiling. The passage from the outer grating to the back of the fireplace and thence to the inlet into the room is so contrived as to minimise the possibility of draught, and this appears to be the chief distinction between it and other fireplaces on the same principle. On the other hand, we have always maintained that the top of the room is the wrong place to admit fresh air, whether warm or cold, as it comes at once into contact with and mixes with the contaminated air which has risen to the upper portion of the room. Apart from this,

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* See *ad loc* Parton's (1822) and Dobie's (1829) local histories: also the "Dictionary of Architecture," *s. n.* Flitcroft; and one of T. Donowell's two drawings of 1735.

† "The Doom of Newgate," in the *Builder*, December 22, 1888.

‡ John Forster's "Life and Times of Oliver Goldsmith": Rawle's view of the house was published by J. Asperne, Cornhill, in 1813; and a woodcut appeared in the *Mirror* of September 3, 1825. For the examinations, see "Roderick Random." Smollett visited Goldsmith in Green Arbour-court.

the grate seems an excellent one, effective, economical, and simply constructed; only we do not see exactly where the claim to novelty and improvement comes in.

WE observed that last week there was a discussion in the Liverpool Town Council as to removing a stained-glass design from the large semicircular window in the south end of St. George's hall. The recommendation came from the Finance Committee (who appear to be the chief arbiters of artistic matters in the Liverpool Town Council), and no one known by name as a connoisseur about such things took any part in the discussion, which ended by the question being referred back to the Finance Committee. We do not remember what the window is like, but we can assure the gentlemen of one thing, that they could propose nothing worse for the effect of the Hall than to fill such a window with plate-glass. The Hall suffers from want of scale now, and to leave a gaping opening of bare plate-glass would be deliberately removing one means of giving it scale. If the existing stained glass is bad let them get better, or in default of that fill the openings with plain glass in decorative leading; but anything rather than plate-glass.

THE LATE BARON HAUSSMANN.

BARON HAUSSMANN, once in great repute as Préfet of the Seine, a Senator under the Second Empire, and Grand Cross of the Legion of Honour, died suddenly on Sunday last, at the age of 82.

In spite of his detractors, the name of the "grand Baron," as he used formerly to be called at the Hôtel de Ville, will undoubtedly go down to posterity in connexion with the transformation, embellishment, and sanitation (in a comparative sense at any rate) of modern Paris; and it will be remembered that it was mainly owing to his exertions that questions of public hygiene have made such progress of late years in Paris that the city, since 1866, passed comparatively unharmed through three cholera epidemics which caused serious ravages elsewhere, and would have had much more serious effects in Paris in the pre-Haussmann period.

Georges Eugène Haussmann was of an Alsatian family, but was born in Paris in 1809. His father was Intendant Militaire and his grandfather sat on the benches of the National Convention. He became first a pupil of the Conservatoire de Musique, but subsequently, abandoning this study, he was received as an advocate ("called to the Bar," as we should say in England), and entered into the Administration after the Revolution of 1830.

He had been a fellow pupil of the Duc d'Orléans, and thanks to his support soon became Préfet of Nérac, and went from there to St. Girons and to Blaye. From 1850 to 1852 he occupied the prefectures of Var, Yonne, and la Gironde. It was while in that department that the Prince President, as he was then called, on journey some little time before the *coup d'Etat*, was so struck with Haussmann's ability that, after he had assumed the Imperial power, he summoned him to Paris, in 1853, to take the prefecture of the Seine, which office he held until 1870. During this period of seventeen years he enjoyed the confidence of the Emperor to absolutely as to be popularly called "The Vice-Emperor of Paris." He became a member of the Ministerial Council, and commenced his immense scheme for Parisian improvement on a great scale, which is still not completed.

With the assistance of the engineer Belgrand, who had occupied a post under him at Yonne, he commenced the modern and extensive sewer system of Paris, which constitutes a kind of second city beneath the soil, every main avenue and almost every street having its corresponding sewerage canal underneath. It was with the collaboration of the same engineer that he established the additional water supply from the Dhuis and the Surmelin as well as that of the Vanne, which necessitated, from Sens to Paris, new works of a very important character.

With the assistance of M. Alphand, whom he had become acquainted with at Bordeaux, he completely transformed the Bois de Boulogne, improved the Bois de Vincennes, formed new squares planted with trees in all the arrondissements, and created out of an expanse of waste land the park of Buttes-Chaumont.

He prolonged the Rue de Rivoli to Rue St. Antoine, destroying in the process the winding lanes and dark passages which surrounded the Tour St. Jacques and the Hôtel de Ville. He carried out the Boulevard Sebastopol, which on the right bank was prolonged by the Boulevard St. Michel. The Boulevards Prince Eugène (now Boulevard Voltaire), Malesherbes, Haussmann, and St. Germain, the fine avenues which radiate from the Arc de Triomphe, the Rue Turbigo, the Chemin-de-fer de la Ceinture, all these immense works were carried out under Haussmann's direction.

We must also mention among his work, or work which he caused to be done, the transformation of the Champs Élysées, of the Chaussée d'Antin, the Rue de la Paix, the space around the Bourse, and the creation of the Halles Centrales; also the building of various theatres, the Lyrique, the Gaité, the Châtelet, and the Vaudeville, and the commencement of the Avenue de l'Opéra. It is to him that Paris owes also the suppression of the *mur d'enceinte* established in the eighteenth century and the annexation of the former suburb (Batignolles, Montmartre, Passy, Auteuil, Vaugirard &c.), which makes Paris now reckon as a city of 1,500,000 inhabitants.

The execution of these operations necessitated a great many loans, and the financial operations of the "grand Baron" were much criticised and discussed both in Parliament and by the Press. There is still recollection of the violent attack flung at him in 1869 by M. Jules Ferry, under the title, "Comptes fantastiques d'Haussmann." But with the support of the Emperor the Préfet of the Seine was not moved by these attacks; he demanded that the budget for city works should be passed by the Corps Legislatif; and carried his point. With the advent of M. Olivier to power, however, he was sacrificed, and, refusing to resign, was dismissed in 1870 and replaced by M. Henri Chevreau.

After the revolution following on the war, Haussmann lived abroad for some time. After 1872 he stood without success as a candidate for the National Assembly, and was later, in 1877, elected député for Ajaccio. More lately he had retired into private life and was occupied with the preparation of his Memoirs, the publication of the first volume of which, last year, excited a good deal of curiosity.

It is to Haussmann's initiative that there is due the project for the formation, at Méry-sur-Oise, of a great cemetery for Paris, which was intended to be sufficient for many years to come. There was to be a special railway to it, worked at a very low rate of charges. The scheme, taken up again in 1874 by the Municipal Council and supported by M. Herold, may be said to have been an essentially popular and democratic piece of work planned under a despotic Emperor. Oddly enough, it was defeated by a coalition of the Right with the Extreme Left, the Clericals with the Radicals.

In 1867 M. Haussmann was elected member of the Academie des Beaux-Arts, replacing M. Fould. His detractors declared that when the new Mairie of the First Arrondissement was built, he gave orders to scrape the façade of St. Germain l'Auxerrois to bring it into harmony with the new building adjoining. This, we believe, is a pure calumny, for he was really an enlightened man in these kind of matters, and during his administration always took a keen interest in artistic questions, and drew round him the élite of the painters, sculptors, and architects, to whose opinions he always showed great deference. It was his doing that such men as Delacroix, Robert-Fleury, and Duban, were brought into the Municipal Council of Paris. The splendour and good taste of the fêtes which he organised at the Hôtel de Ville must also not be forgotten, particularly that in 1855, to receive Queen Victoria, and that in 1867, to do honour to the numerous sovereigns who had come to Paris on the occasion of the Exhibition of that year.

There is no doubt that the services rendered by Haussmann to modern Paris give him a title to be gratefully remembered; and in spite of the rancour and injustice shown towards his brilliant administration by the Government of recent times, he will always be regarded as an important figure in the nineteenth century history of France. At the present moment many to whom the past history of Paris is deeply interesting as a study, may regret the destruction of those old, dark, tortuous, streets which were all that was left us of the Paris of the past, and which survive for the present generation only in the picturesque and lovingly-detailed descriptions of Balzac; but as a mere matter of sanitary condition of the city they must have gone sooner or later, and it is hardly fair to quarrel with the memory of Haussmann for having accomplished, a little too soon for some of us, what some one else must inevitably have carried out not long after. In one sense perhaps it was well that such a work was carried ont under such a government as the Second Empire; under a less ambitious and more responsible rule perhaps there would not have been found the funds to do it on the grand and liberal scale on which it has been done; and if the second Emperor and his Haussmann deprived us of the picturesque of Paris, it must be admitted that they did their work on a sumptuous scale, and left a capital, if not picturesque, at all events spacious and stately in no ordinary degree.

ON THE USES OF OPAQUE GLASS IN DECORATION.*

IN selecting a subject for the paper which I have the honour to read to you this evening, and understanding that you had lately been considering the subject of painted or translucent glass, I thought I could not do better than turn to the uses of opaque glass, and attempt to explain the varied applications of it in decoration.

By selecting the word "opaque" one is able to embrace the various methods of *opus sectile*, *opus figlinum* or pictorial mosaic, *opus Graecanicum Cosmati*, or geometrical mosaic, and the uses of enamel in the processes known as *champlévé* or *cloisonné* and painted enamel.

It is generally considered that amongst the first uses of glass as a means of decoration, the opaque form of it was the earliest, and considerably earlier than translucent glass, as we know it in window decoration. The beautiful little vases of various colours that we see in our museums, ornamented with zig-zag bands of decoration of opaque white, yellow, or turquoise, and which penetrate into the surface, are among the early examples of Greek and Egyptian work; and then there are various vessels, beads, amulets, &c., of different colour, which have been found in such large quantities in Egypt and Phœnicia. In the British Museum are some flat pieces of opaque glass, polished to a perfectly smooth surface, some square, others oval, oblong, and octagonal, many of which have bevelled edges, and measure about 1½ in. by 1½ in., or 2 in. by 1½ in., &c. These are of most beautiful colours,—turquoise blue, ruby red, orange, emerald green,—whilst others are mottled with other colours, and others made in imitation of precious stones and marbles, from which it would be very difficult for any one but an expert to distinguish them. The turquoise blue, made from copper, was a very favourite colour.

Greek and Latin writers describe statues and obelisks, 10 ft., 30 ft. and even 60 ft. high, made of one, three, or four emeralds, which were undoubtedly of glass. We learn from Pliny that the Romans, in his time, made many varieties of opaque glass, and he mentions particularly, red, white, and black. The Romans, we know, in early days, were masters of many methods of uniting or flashing various colours one on another, and so produced what is known as "cameo glass," the best-known instance of which is the Portland Vase. This is made by coating dark blue opaque glass with a white opaque glass, whilst in a molten state, and welding them together. They are blown out as one glass to the required shape, and then, after being annealed, the white parts are carved with the required design, removing it all in places to show the blue groundwork, and getting shadows by nearly removing the white and showing the dark blue through.

This will, I hope, show that the ancients were well-versed in all ways of making and using glass, and in succeeding ages their knowledge was turned to good account in the different modes of decoration which are of more special interest to ourselves.

One early instance of the use of coloured glass in architectural decoration in the best period of Greek art, though trifling in itself, is

* From a paper by Mr. James C. Powell. Read at the Architectural Association meeting, January 9, as elsewhere mentioned.

very suggestive. It is in the Temple of Minerva Polias, at Athens; here pieces of blue glass are inlaid in the plaited torus between the volutes of the capitals of the portico.

Pliny says that Scaurus, the stepson of Sylla, constructed a theatre of three stories, the lowest of marble, the second of glass, and the third of gilded wood. This glass was, no doubt, attached to the walls in the manner of *opus sectile*. To this process I will now call your attention. In excavating a villa on the Via Cassia, about four Roman miles from the Porta del Popolo of Rome, said to have belonged to Lucius Aurelius Verus, son-in-law of Marcus Aurelius, there were discovered a large quantity of pieces of opaque glass, cut to various shapes, which, when pieced together, showed various patterns in *opus sectile*, several pieces of which can now be seen in the South Kensington and British Museums. These pieces vary in thickness from $\frac{3}{16}$ in. to $\frac{1}{2}$ in., and can, therefore, never have been used for pavement work. From the known date of the villa this decoration must have been of about the second century. From the nature of this glass, having had fragments of it in my hand, I should say that it has been melted in a furnace very similar to those now in use in Venice, and ladled out on to the marver or metal table and pressed, whilst it retained its elasticity, into circular discs, and then cut by the wheel into its present shapes, as we know that the Romans understood the art of cutting by the wheel glass vases. The square lines which form the trellis-work of the pattern are of red glass inlaid with white beads, which traverse the entire substance. This may have been done by using glass in the state of powder or paste, or moulding by the process known to the Italians as Mille fiori. Semi-transparent pieces of greenish-blue glass are also used in this, as well as plaques of black and white glass like onyx. In some of the cases at South Kensington Museum are fragments of many shaped and coloured pieces, showing that there must have been great varieties of pattern and colour decoration. It is curious to note in these specimens how near the Romans were to the method of making mosaic windows, for we must remember that they could make translucent as well as opaque glass. In the British Museum are several larger pieces, both of pattern and fragments of coloured glass. Mr. Nesbitt, in his paper on "Wall Decoration in Sectile Work, as used by the Romans," read before the Society of Antiquaries, gives other forms of glass sectile work, including two patterns from the Museum at Naples. "These," he says, "are of more elaborate design than any I have ever met with, the pieces being accurately shaped and fitted. Each octagon contains from twenty-five to thirty-two pieces, and must have been costly to produce." Mr. Nesbitt notes that the pieces are not chipped, but ground to their shapes. Two fragments also came into Mr. Nesbitt's hands; one is the upper part of a female head, the other a part of a figure of a fish; these are now in the British Museum, in the White Room, where I examined them the other day. They seem to have been formed by an elaborate process. The glass, of appropriate colours, seems to have been cut to the required shapes and then placed on a smooth surface in proper order, and a mass of molten glass poured upon them so as to unite them in one piece, and then polished down. By this process the edges appear blended and the outline softened, and in that way have an advantage over tesselated work by being more durable and the effect of the colour more blended. (Mr. Powell here showed a specimen of a decorative glass tile made by his firm of several pieces of glass, which were welded into one mass by a somewhat similar process to that just described, and said that possibly a use might be found for this process in the decoration of hearths.) Another illustration to Mr. Nesbitt's paper shows fragments found in the neighbourhood of Rome, and two others show examples of Roman sectile work, being nearly all that remains of the decoration of a great hall or basilica, erected by Junius Bassus, Consul A.D. 317. These are not all of glass, but are made up of various materials—green porphyry or serpentine forming the groundwork, with variegated alabaster, *giallo antico*, and opaque glass. In the picture of "The Rape of Hylas," which is the subject of one of the plates in Mr. Nesbitt's paper, glass is used in the water and in the blue and red draperies; and in the band of small figures below, the draperies are of *mille fiori* glass, formed by making cones with threads of glass of various colours, so arranged as to present some resemblance to an expanded flower. The rods so formed were cut or broken transversely, and each section would present the same pattern. These sections were then placed side by side in a mould and united by heat, and these were worked up into vessels, tablets, &c. Many of the pieces employed in this mosaic are apparently fragments of vessels made of this *mille fiori* glass, and which were used in Rome for dishes, plates, and other table utensils, much as we now use porcelain. It must have been very largely used, as it is found in such quantities on the sites of ancient villas. Another picture illustrated by Mr. Nesbitt is made of similar materials, the glass being used in the garments of the figures and trappings of the horses. In the House of the Faun at Pompeii many fragments of amethyst and opaque red glass are embedded in the pavement, in conjunction with small pieces of variously-coloured marbles, and fixed in a hard cement, in the manner now known as "*Alla Veneziana*." Von Minutoli mentions a pavement of glass sectile work discovered in 1820 in excavations made not far from the Portico of the Temple of Venus at Rome,—near the Colosseum; also a pavement of slabs of green glass at the Isola Farnese, nine miles from Rome on the road to Viterbo. In the late *opus Alexandrinum* pavements glass has been found. Opaque glass is also in the pavements discovered at Carthage and at Bignor in Sussex; and in a Roman pavement in the Museum at Cologne glass is said to be used. From these examples we see that the Romans made use of many materials such as gave the colour they required in their pavements and wall decoration, and were well versed in all possible ways of applying glass.

We now come to the consideration of the most important use of opaque glass, viz., that of mosaic, as it is usually called. The art of the mosaicist was undoubtedly of very great antiquity, and was practised by many nations and in many materials. Many centuries before Christ we read of mosaic applied to architectural ornament as having been perfected in Chaldæa. Marble, also, was of course very largely used, but principally for pavement decoration. It was not, however, till the fourth century of our era that glass came to be so largely used in all mosaic decoration; the very varied colours that it was found possible to make so easily, and the introduction of an imperishable gilding produced by such simple methods, gave an immense impetus to its manufacture. The glass, which was rendered opaque by the addition of oxide of tin, coloured as required with one of the metallic oxides, was melted in crucibles, no doubt in a similar way to that now used at Murano, where the crucibles are ranged much like washing basins in a lavatory, with the wood fire underneath. The glass, when sufficiently melted, is ladled out in small quantities on to a metal table, and pressed into circular cakes averaging about 8 in. in diameter and about $\frac{1}{4}$ in. thick. These are then annealed and gradually cooled in a kiln, and when cold, are ready to be split and cracked up into tesseræ, which are afterwards sub-divided again as the mosaicist requires. The "fracture" surface is used for the face of mosaics made in this manner. Oxide of tin is used for the whites, because it gives the granular surface. A pure white, such as we make now for watch-faces, is made with arsenic, and it is this that is also used for thermometer tubes; it is more brilliant and glassy than that made from tin, and, therefore, not suitable for mosaic work. From the oxide of copper we get three colours; with the larger amount of the copper and less of the oxygen we get red; with a less amount of copper, a green; and with still less copper and more oxygen you get that beautiful blue which the ancients were so fond of using, viz., a turquoise blue. From the oxide of cobalt come all the purple blues, from chrome a mustardy yellow, from uranium a more orange yellow; but the latter is an oxide that is only of recent discovery, so charcoal may have given the old yellows. The text-books are always fond of quoting antimony for yellow, but we have never been able to get the slightest tinge of yellow from it. Gold produces pinky reds, and the flesh-colours can be produced from very small proportions of it. Manganese gives us purples, and an excess of it, with an addition of cobalt, will produce a blue-black. A much less costly white enamel is made from cryolite, and is used for opal sheet-glass, lamp-shades, &c.; it is composed of soda and fluor-spar.

We have now got the principal colours for our mosaic, and from which endless varieties of shade can be produced. When I was at Murano, in 1875, at the works of the Venice and Murano Glass Company, they told me that they had made 37,000 colours, and 400 golds.

We must now turn our attention to another most important material,—viz., the gold. This had been previously used in different ways in glass-making for the decoration of vases and plaques such as that in the British Museum,—the remains of a shallow bowl discovered at Cologne (Birch Collection), studded with coloured medallions on which are Christian figures in gold which have been covered with another layer of glass. This is the principle of all gold mosaic, viz., that the leaf of gold is sandwiched between two glasses united by heat. The usual plan now is to blow a thin sheet of clear glass of the thickness of stout drawing-paper, and to fasten to it with weak gum and water the leaf of gold (or silver, for this was done in the same way). The glass is then taken to the furnace and made thoroughly warm, when molten glass, often of an opaque red, is poured on it, and unites at once with the thin sheet, and by pressure both are united into one cake. If instead of white glass for the front surface you substitute coloured glass of pink, green, or yellow, you will get various effects of coloured golds or silvers. Before leaving the subject of the manufacture of gold glass I should like to call your attention to those plaques of gold with etched subjects on them discovered in the catacombs of Rome, some of which are in the South Kensington Museum. These plaques must be almost the earliest Christian decoration, and are of immense interest from their examples of costume and other details. When Mr. Wiltshire brought some of the specimens to Whitefriars we tried some experiments to see how they were made, and found that after the leaf of gold was placed on the front sheet of glass you had only to etch away the groundwork of the figures, and to draw with a fine point the features or lines of drapery, and back it in the same way as the gold cake; or you could paint with enamel colours any objects on the glass before the gold leaf was applied.

It is, of course, of the utmost importance that the glass which forms the face and that of the back should have the same base, or the two will not join entirely, and will afterwards come apart and the gold become exposed.

With such a rich field of materials, which was still further augmented by the use of mother-of-pearl, and, in some cases of whole oyster-shells, as at Parenzo, it is not surprising that such gorgeous effects were obtained, and that mosaic became so popular, and was used in such large quantities. The chief centres of the work seem to have been Constantinople, Ravenna, and Rome; but the influence which seems to have guided all designers was Byzantine. The art of glass mosaic may be said to have begun in the time of Constantine, early in the fourth century, and continued almost to our time, for in the year 1728 some mosaic decoration was done at St. Mark's, Venice. So great was the demand for this means of decoration that many of the most famous artists of their time were called in to design for it, amongst whom may be mentioned Cimabue, Giotto, Ghirlandaio, Pordenone, Raphael, Titian, Tintoret, and others, but with varying success, depending, I think, on their keeping within the limits of the material and their not being tempted into the pictorial treatment that was possible in their fresco work. To get a rough notion of the continuity of the art in its best periods, it is worth while to turn to the chronological table so ably set forth in the "Encyclopædia Britannica," art. "Mosaic." The table professes to give a selection only of the most important glass mosaics and in the best periods. As mosaic is to be the subject of a paper to be read before you during next month, I will not enter fully into the description of these mosaics, or give an account of the process of working; nor will I say anything as to what our aims should now be in designing for mosaics, but what I tell you may, I trust, serve as a prelude to your next paper.

Amongst the earliest examples to which I will refer are those in the circular aisle of the Baptistery built by Constantine, *c.* A.D. 320, known as St. Costanza. The vault is covered with mosaics and animals and birds, very correctly represented, with vine-leaves and branches of grapes and different operations of the

vintage, the colouring being very simple and decorative, principally of blue, green, yellow, and red on a white ground. This white ground has a very pleasant effect, and unites the decoration with the other parts of the building in a way that is deserving of study. Very good paper casts of these mosaics are to be seen at South Kensington. (These casts, I believe, were made by Mr. Purdon Clarke, by pressing soft paper to the mosaic, and then, by damping the paper, taking the impression of each of the tesseræ. The paper is then put on a stretcher, and coloured on the spot piece by piece.)

Next we may notice the mosaics of the Baptistery of Ravenna, the date of which is about 450. Anyone who has seen it must have been struck with the extreme beauty of the work, and with the simplicity of its colour-scheme, which is always the case in good decorative work, the number of colours used being comparatively small. When I was in Ravenna in 1878, the Baptistery was about to be restored, and the floor was filled up to within half the height of the columns. I believe the real height to spring of arches to be about 14 ft. In the lower spandrels of the arches is an acanthus scroll of varied olive green, outlined with gold, the tendrils being entirely of gold, and all on a rich deep blue (cobalt), which in certain lights appeared almost black. In the central spaces of oval-shape formed by the scroll are white figures of the Prophets, on gold grounds. These figures, which have not the nimbus, are shaded with grey and grey-green, which is always arranged to touch the gold ground, and so emphasise the figures. Pure white is only used in the high lights of the drapery. The figures stand on a base of grey-green. When the green scroll comes on the gold ground it is ferced with an outline of the same dark blue of the groundwork. The cupola has a representation of the baptism of Christ, on a gold ground, as a central picture: in the middle is a large cross, above one arm of which is the Dove descending — white outlined with grey. St. John, in a half-kneeling attitude on a rock, is pouring the water on the Christ, which is a full-length figure, the water coming nearly to the middle. In the circumference are the twelve Apostles, separated from one another by a conventional acanthus plant, to which are looped swags which form canopies over them. The figures, which are colossal in size, stand upon a dark-green base, which comes as high as the knee, with a light blue background, and are under swags of gold and white decorated drapery, which embraces the whole circle of the cupola, and is divided into compartments by yellow and gold acanthus candelabra. The dresses of these figures are alternately of yellow (albs) under and white over (pallium) dresses. The yellow is the ordinary opaque glass, but is used with gold in broad light. The treatment of the flesh is simple, and, when it comes next to the gold, is outlined with red, except on the shadow side, where brown is used. The attitude of these figures is easy and dignified, and they form a striking contrast to the stiffness of the later mosaics. The heads are small, and have individual character; although the action of the figures is that of walking, the heads are not given in profile, but full-face. The draperies are fine in conception and execution, and recall in their flow and grand massing the best Roman works. The simplicity of the whole work in its composition and colour scheme gives it, to my mind, a greater charm than is to be found in many of the later works. The tesseræ, so far as I could judge, are of uniform size,—about $\frac{3}{8}$ths of an inch,—and I was fortunate in finding amongst the *débris* a fallen tessera.

Another important point in connexion with this work is that the tesseræ are fitted so closely that hardly any cement shows on the surface; the joints, therefore, tell as dark instead of light, thereby strengthening the effect of colour. Where the cement shows on the surface it must become light in time, and so lower or detract from the colour. The mosaic is in all cases taken round the angles given by the architecture.

To go on describing the various mosaics of Ravenna and Rome would be impossible, but I should like to refer to the, perhaps, more celebrated ones of St. Apollinare Nuovo, as they show to what extent this mode of decoration was used. The nave of this church is about 126 ft. long and 42 ft. wide, and the celebrated processions of female saints on one side, and of male saints on the other, extend along its whole length, and occupy a space about 10 ft. in height, being about 20 ft. from the floor-line. The twenty-five male saints on the south side coming from the Palace of Theodoric, shown at the west end, lead up to a representation of Christ in majesty, who, seated on a throne with two angels on either side, is blessing with the right hand, and holds a sceptre in the left. The twenty-two female saints or virgins are represented as coming from the old seaport town of Classe, shown in mosaic at the west end, and are preceded by the three Magi, who are offering their gifts to the infant Christ, who is on His mother's knee. The Christ in Majesty has a purple dress with stole of gold mosaic, cruciform nimbus with pearls on ruby ground, and with green and gold decoration. Above the procession of saints are panels of single figures alternating with blank panels, and above the latter are small subjects in mosaic, fourteen on each side, all taken from the life of Christ, and illustrating several of the parables, miracles, &c. In all these pictures the figure of Christ is represented in a purple dress. In the subject of "The Last Supper," all the figures are reclining. In the subject of "Christ led out to Crucifixion," Simon bears the cross. I mention these details as, from the early date of these mosaics, they are often taken as correct examples of treatment.

In Messrs. Texier & Pullan's book on Byzantine architecture, a graphic account is given of the mosaic decoration of St. George's, Thessalonica (sixth century). I refer to it to show the extent of the work then. They say: "We may gain some idea of the prodigious labour employed in their execution from the following calculation:—The diameter of the cupola is 78·72 ft., the circumference 247·259 ft. The surface contains 9,732 square feet. Each cube being ·016 ft. square, there would be 3,718 cubes in every square foot, or more than 36,000,000 on the whole surface of the dome." (The dome of St. Paul's measures, I believe, 16,800 square ft.) The tints employed are infinite, but there are ten principal colours. Messrs. Texier & Pullan say that they have never observed a single natural stone in these mosaics.

In the mosaics at St. Mark's, Venice, there is a large use of gold mosaic, which is to my mind one of the great difficulties the designer for mosaic has to contend with, for it enlarges in effect the spaces covered with it, and if used solely as a groundwork, merely cuts out all objects on it as *silhouettes*. The old mosaic-workers, when using gold as a groundwork, also introduced it in the enrichments of the draperies, in fruit and foliage, and in wings; and in the Baptistery at Florence, I remember seeing it used for the high lights of angels' hair. In this way the whole is blended together. In the south transept at St. Mark's, in the soffit of the arch, is a representation of "The Last Supper." The whole groundwork is of gold, but the draperies of all the figures have gold worked into the high lights, which are placed on the side from which the mosaic is lighted. The table-cloth itself is of gold, the folds being marked with red lines. The whole has, of course, a very rich effect, and the figures do not cut out hardly from the ground. In the Baptistery at Florence gold is used in a similar way, but is shaded with red and black. I have noticed generally that more black is used for outlining in flesh and draperies in these later mosaics than in the earlier ones at Ravenna. The tesseræ at Florence are generally smaller than at Ravenna, averaging $\frac{1}{4}$ in. by $\frac{1}{4}$ in. In the mosaic of the Archbishop's Palace chapel at Ravenna, in the figure of the Virgin over the altar, the mosaic tesseræ are $\frac{1}{4}$ in. by $\frac{1}{4}$ in., and the black outlines $\frac{1}{8}$ in. wide.

I was enabled accidentally when at Florence to ascertain the exact size of tesseræ used in the dome of the Baptistery. On going in one morning I found a workman suspended in a basket from the lantern busily engaged in cleaning the mosaic with a broom or some such weapon, and at every stroke some tesseræ were detached and fell to the ground. If this cleaning process is often repeated there will soon, I fear, be little left of the mosaic.

In the south aisle of the nave of St. Mark's, Venice, is a fine series of single figures on gold ground, divided from one another by panels of marble split into eight slabs. In these figure-panels gold and silver are used in the draperies and foliage decoration. In the north aisle of the nave is a small pavement in which opaque glass is largely used.

In thinking of the Venetian mosaics, both on wall and in pavement, one cannot but regret the great injury that has been done by restoration. It was, therefore, refreshing to read in the *Builder* of December 6 last (p. 433) a description of the method of removing and refixing the mosaics in the Church at Daphne, near Athens, a work which was undertaken at the request of the Greek Government. The method employed was to cover the face of the mosaic with a thin coat of plaster of Paris, and on this was glued a stout sheet of canvas. The mosaic was then gradually detached from the wall by cutting it away from its bedding and rested on a wooden frame or stretcher made exactly to fit it, in which it remained until after the whole of the plaster had been cleared away from the back of the cubes, when, the wall being made ready to receive the mosaic again by being covered with a fresh wet cement groundwork, the frame to which the mosaic was fixed was pressed firmly on to it, so as to get the cement well into the joints between each cube. It was then left to set hard, and the frame and coating having been removed, the mosaic picture was once more exposed, firmly fixed on to its new backing. No attempt was made to restore the mosaic, but the missing parts were completed in fresco. Mr. T. G. Jackson, in his excellent book on "Dalmatia," gives an account of the restoration of the mosaics in the Duomo at Trieste, in which work a method very similar to that adopted at Daphne was followed.

Mr. Powell next discussed another use of opaque glass, as seen in the mosaics of the Cosmati. This work was all of a geometrical character, and was always used for work near to the eye, and for the decoration of marble tombs, altars, *baldachini*, choir-screens, paschal candlesticks, ambones, &c. The Cosmati were a family of sculptors, architects, and mosaicists, who continued the art during four generations. The earliest of whom we had any record was Lorenzo, who was born in the second half of the twelfth century, and to whom is attributed the design and execution of the ambones in the Church of Ara Cœli in Rome. The mosaics in the cloisters of St. John Lateran and of St. Paolo fuori le Mura, with their slender twisted columns, are all the work of the Cosmati. They are too well known to call for special comment. Each twist of the columns has a different design or pattern on it, as in Edward the Confessor's tomb in Westminster Abbey. This tomb, and that of Henry III., are works of the Cosmati school, which in general style is Gothic in its main lines. After alluding to the mosaics of Palermo and Monreale, and of St. Ambrogio at Milan, the lecturer concluded by a reference to the use of opaque glass as enamel in the processes known as *cloisonné* and *champlévé*, and afterwards explained a number of specimens of ancient and modern work which were exhibited.

The specimens exhibited included two or three pieces of Roman *opus sectile* decoration of the second century, which were kindly lent by Mr. Franks, of the British Museum.

The author expressed his acknowledgments and indebtedness to several works other than those mentioned in this necessarily somewhat condensed report of his paper.

[A report of the discussion which followed will be found on the next page.]

THE ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of this Association was held on the 9th inst., in the meeting-room of the Royal Institute of British Architects, Conduit-street, Mr. Leonard Stokes, President, in the chair.

Mr. H. D. Searles-Wood called attention to a letter in the January number of *A. A. Notes* from Mr. T. Blashill, in reference to a proposed excursion to Italy in the ensuing spring. Mr. Blashill was very anxious to know whether there were enough members, who would care to join such an excursion, to make it worth while getting up. If the excursion went to Italy, it would probably be on very much the same lines as the two former excursions, which extended over twenty-one days, and the cost of which was 25*l.* for each member, everything included. He (Mr. Searles-Wood) would furnish every particular to anyone who liked to write to him.

The following gentlemen were then elected members of the Association:—Messrs. F. H. Lines, H. O. Tarbolton, B. Danks, E. V. Cable, H. C. H. Blyth, S. Buss, J. R. Thorn, A. G. Wallace, W. J. Tapper, S. A. Braam, J. H. Shaw,

P. Waterhouse, A. Hale, C. W. Maplesden, and M. T. E. Jackson.

The Chairman read a letter from Mr. J. M. Brydon, to the effect that he (Mr. Brydon) was anxious to get some measured drawings of Somerset House to illustrate a paper which he was to read before the Association on February 6. If any member possessed such drawings, he would be glad if they would lend them to him for the evening.

Mr. J. C. Powell then read a paper on "The Uses of Opaque Glass in Decoration," the greater part of which we print in other columns.

Mr. H. O. Cresswell, in proposing a vote of thanks, said he thought they were very much indebted to Mr. Powell for the very interesting paper which he had given them, and for the great trouble which he had been put to in bringing before them so many specimens, some of which he had had specially made for the occasion, while he had borrowed others from the British Museum; and also for taking such a vast amount of trouble to explain to them the system adopted in the present day to try and produce similar work to that exhibited. He very much regretted that there was such a small attendance that evening, for very few people could form any idea of the value of the paper from reading it, if they could see none of the illustrations,—which were the essential part of it,—at the same time. He was afraid that the title of the paper, as advertised,—"Opaque Glass,"—was a little unfortunate: he had not quite gathered himself what the title meant, and he thought that the uncertainty of the nature of the subject was the reason why there was such a small attendance. He would like to ask Mr. Powell whether there had ever been any comparison made as to the wearing capabilities of glass and marble in pavements. On walls he thought it did not matter, for there was practically little or no wear; but he would like to know whether in floors glass or marble had been found in practice to be the most durable, as the ancients undoubtedly used the latter whenever obtainable. Mr. Powell had not touched upon the question of translucent glass, but it would be interesting to many of them if he could briefly explain what were the different processes to which the glass was submitted which made the same material in one case opaque and in the other translucent. In some of the Roman mosaics exhibited small pieces of translucent glass had been introduced with apparently very good effect. Mr. Powell had mentioned the tomb of Henry III., and he (the speaker) having measured up that tomb some time ago, knew that what Mr. Powell had said was perfectly correct in reference to the vast variety given to the design, and the absence of hardness and mechanical effect, by what was apparently an accidental alteration in the pattern or various colours of the mosaics. Instead of being all of one stereotyped hardness, he noticed that a pattern was repeated up to a point, and then a little change was effected which gave a charming effect of variety to the whole. At first he thought this was the result of an accident until he found it repeated all over the design. He was glad to hear what Mr. Powell had said on the question of gold backgrounds. When one looked at a gold background with a figure thrown out on it in relief, there was no doubt that unless there were high lines of gold on the figure and draperies we saw nothing but the outline of the figure, and the rest became a blurred mass. What Mr. Powell had said on the subject showed the necessity for carrying a network of gold lines as high lights all over the figure, to express the lines of the drapery, &c., otherwise nothing was obtained but a patch, and any effect of colour or blending of harmonies was utterly thrown away. The effect was just like looking at something against the light.

Mr. W. Burrell, in seconding the vote of thanks, said there would be no excuse, after the paper which they had heard read, for any member of the Association in that room to say that he knew nothing about opaque glass. Opaque glass had to some extent taken the place of marble mosaic. He thought there could be no question that it would wear longer than any marble ever laid down.

The Chairman, in putting the vote of thanks to the meeting, said he must endorse what had been said by Mr. Cresswell and Mr. Burrell about the paper. It was a paper of a kind which largely appealed to the eye, and showed exactly how a thing was done, which was so very useful to them. A description could not be followed so well as an illustration, and if they saw a piece of material treated in a certain way, they were able to grasp its meaning very much better than if they were simply told how it was done. As to the sample of *opus sectile* which had been made up that evening, he must confess he did not like the idea of fusing series of pieces of glass into one tile, and then laying it down. It would no doubt be useful for hearths, as Mr. Powell had suggested, but he could not help thinking that in a series of small pieces it was unfortunate to fuse them into one tile. He would prefer to see them as separate pieces, even at the risk of their coming up. As Mr. Powell had said, mosaic must be used in its proper place. It must not be used for all sorts of improper purposes. Mosaic was not suitable for all kinds of decoration, and if we wanted a picture, he thought it was better to use paint. If, however, we wanted to cover a dome, which was a long way from the eye, then, he thought, mosaic was the most satisfactory thing we could use. He could not help thinking that modern men, in making mosaic, made it too well. In the old style the glass was fractured much more roughly, and the gold background was not so smooth on the surface. In the process which Mr. Powell had described it seemed to be absolutely necessary that the gold should be smooth, and he thought that if it were rougher altogether, a better effect would be produced, and the surface would be more darkened and less brilliant as a mass, although there would be brilliant points in it.

The vote of thanks was then put and carried unanimously.

Mr. J. C. Powell, in reply, said he was sorry he had called his paper by a rather unfortunate name; but if he had called it "Mosaic" he would not have been able to go into so many subjects. Then with regard to enamel, people in talking about enamel, thought they were talking about something different, but really it was the same thing, for it was an opaque glass. It should be known that it was the same material, and not that enamel was a different material from mosaic and mosaic a different material from enamel, but that they were both forms of opaque glass. With regard to the tomb of Henry III., the varying of the pattern of the mosaic was the art of the work. If it had been designed in any one pattern all round, the pattern not changing, the effect, he thought, would have been most monotonous, and the Italians were masters enough to know that that would be the case. The variations which had been spoken of were not due to restoration, because similar works in Rome, which had hardly ever suffered from restoration, showed the same variations. In reference to gold backgrounds, he had noticed at Ravenna that they were certainly much more uneven, and he thought they were fixed in that way purposely. He thought it was one reason against modern work that the gold backgrounds were all fixed to a dead level. This was not so in the old work. With regard to the fused tile of *opus sectile*, the sample was made simply to explain the old process of the Romans, and he quite agreed with Mr. Stokes that there would be no extended use for it. But if we wanted anything of a very delicate inlay, we could polish a piece of such work, whereas we could not polish it so readily if backed in cement; but he quite agreed that it would be better if put together in cement. With regard to the cause of the difference between opaque and translucent glass, the process of manufacture was the same, but it was the use of lime or other materials which made the glass opaque.

The meeting then terminated.

Advanced Class of Construction and Practice.—At the meeting of this Class held at No. 9, Conduit-street, W., on Wednesday, January 14, Mr. C. H. Brodie read a paper explanatory of the "Planning and Construction of American 'Frame' (or Timber) Houses." Some sets of working drawings, &c., specially sent by Messrs. Burnham & Root, of Chicago, and Messrs. Palliser, of New York, were exhibited. Votes of thanks to these gentlemen as well as one to the reader of the paper were passed by acclamation.

ROYAL INSTITUTION OF GREAT BRITAIN.—A course of three lectures on "Pre-Greek Schools of Art" will be delivered by Mr. W. Martin Conway, M.A., F.S.A., on Saturdays, January 24, January 31, and February 7, at 3 p.m.

THE LONDON COUNTY COUNCIL.

THE London County Council resumed its weekly meetings, after the Christmas recess, on Tuesday last, Sir John Lubbock in the chair.

The Bethnal Green Slum Clearance Scheme.—The consideration of the following adjourned report of the Housing of the Working Classes Committee was resumed:—

"Your Committee have had under consideration a letter from Messrs. Clutton, valuers to the Ecclesiastical Commissioners. The letter states that the Commissioners are in negotiation for the sale or lease of two houses in Shoreditch, which form part of the Boundary-street area.

Before committing themselves to the granting of a building lease, the Commissioners wish to know whether the Council is prepared to enter into a provisional contract for the purchase of the freehold of the site, subject to Parliament approving the Boundary-street scheme. The proposed lessee is prepared to give 125*l.* a year ground-rent.

It is difficult to understand what object can be served by the erection of buildings on the site, unless it be with the intention of claiming compensation. The Solicitor of the Council and your Committee are of opinion that if any fresh interest is created, no separate estimate thereof could be made so as to increase the compensation for the land, as enacted in section 21 (b) of the Act of 1890, which provides that—

'Any addition to or improvement of the property made after the date of the publication, in pursuance of this part of this Act, of an advertisement stating the fact of the improvement scheme having been made shall not (unless such addition or improvement was necessary for the maintenance of the property in a proper state of repair) be included; nor in the case of any interest acquired after the said date shall any separate estimate of the value thereof be made so as to increase the amount of compensation to be paid for the lands.'

But if, in spite of this, the proposed lessee of the Commissioners did build on the site, expensive litigation might result.

The price asked for the freehold by the Commissioners is 3,300*l.*, with costs to be paid by the Council.

The Council's valuer estimates the value of the site for commercial purposes at 1s. a foot ground-rental, or a capital sum of 3,000*l.* at twenty-four years' purchase. The area of the site is about 2,520 square feet, and your Committee think 3,000*l.* a fair price to give for the freehold. The site is in a very good situation, being at the corner of High-street and Calvert-street, Shoreditch. Your Committee are, however, strongly of opinion that the very dilapidated condition of the houses is such that nothing more should be given than the mere value of the ground, and the value has been estimated on this basis. Your Committee understand that similar provisional contracts have been entered into in former years under like circumstances. Your Committee, therefore, recommend:

'That the Committee be empowered to enter into a conditional contract, on behalf of the Council, for the purchase of the freehold of the above-mentioned site at the corner of High-street and Calvert-street, Shoreditch, for a sum not to exceed 3,000*l.*, the purchase to date from Christmas, 1890, but such contract is not to be binding on the Council unless Parliament passes the confirming Act this session for the Boundary-street area, nor unless this site is included in the plan confirmed by the Act.'"

On the motion for the adoption of this recommendation, at the last meeting of the Council,

Councillor Marsland moved, as an amendment,

"That the Council do disagree with the recommendation."

This amendment was now, after considerable discussion, carried by a large majority, Councillors Roberts and Edis being amongst those who contended that the price proposed to be given to the Ecclesiastical Commissioners for this land was exorbitant, and at least twice as much as it would fetch in the open market.

Tenders for Painting at Myatt's Fields.—The Parks and Open Spaces Committee reported on this matter as follows:—

"We have, in accordance with the authority of the Council, invited tenders for the painting of the railings and other things at Myatt's-fields. Advertisements were issued, with the result that the following tenders were received in response—W. Luscombe, 39*l.* 10s.; W. & E. Mills, 56*l.*; G. Taylor, 58*l.*; W. Akers & Co., 87*l.*; Vigor & Co., 87*l.*; F. Smith, 87*l.* 10s.; M. McVey, 87*l.* 15s.; G. Barker, 92*l.* 10s.; Anti-Flame Fire Proofing Company, 98*l.*; G. W. Ford, 113*l.* 10s.; Cowper & Squires, £120*l.*; W. K. Randall, 123*l.*; Arthur & Co., 135*l.*; "Excelsior" Co-operative Builders, 140*l.* 10s.; Green & Son, 147*l.* 19s.; C. Rhodes, 170*l.* 10s.; W. M. Settlefield, 172*l.*; W. Dudley, 197*l.* 9s.; G. W. Stewart, 200*l.*; and H. Munn, 330. We directed the solicitor to make inquiries into the position of

Mr. Luscombe, and such being satisfactory, we now recommend—

'That the tender of Mr. W. Luscombe, to carry out sundry painting works at Myatt's-fields, in accordance with specification, for the sum of 39*l.* 10s., be accepted; that the Solicitor do prepare the necessary contract, and that the Architect do employ a Clerk of Works to see that the work is properly carried out, and that proper materials only are used.'"

This recommendation led to an animated discussion, and an amendment was moved to the effect that the matter be referred back to the Committee for further consideration, on two grounds, firstly, that the present period of the year was not suitable for doing painting work, and secondly, on account of the great discrepancy in the tenders. In the course of the discussion, Councillor Roberts, as a builder, and Councillor Edis, as an architect, both stated that the price at which the lowest tenderer offered to do the work was not anything like an adequate one, and that the Council ought not to accept such a tender, for they could not expect the work to be properly done at such a price. It was stated that the Architect's estimate for the work was 120*l.* On the other hand, Councillor Dickinson, Chairman of the Committee, said that all inquiries into Mr. Luscombe's respectability and solvency were satisfactory, and he would be bound by the specification, and by the vigilance of a clerk of works, to carry out the work properly. In the course of further discussion, it was argued that in this and some other cases builders and others sometimes put in very low tenders for work for public bodies "for the sake of an advertisement," thinking that what they might lose on one job would be more than made up to them by other people who would come to them and offer them work on the ground that they did work for public bodies. Eventually the amendment was lost, and the recommendation of the Committee was agreed to.

After the transaction of other business the Council adjourned.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

MEDALS, STUDENTSHIPS, AND PRIZES.

THE following results of the annual competition for the Institute's Medals and Prizes are announced:—

The Institute Silver Medal and 25 guineas, for the best essay on the Treatment and Disposition of Windows in Civil and Domestic Buildings in the United Kingdom:—

I. "Hae Fenestræ."
II. "More Light": George H. Blagrove (successful candidate).
III. "Prodesse quam conspiceri."
IV. "Wynt dor."

The Institute Silver Medal and 10 guineas, for the best Measured Drawings of any important Building in the United Kingdom or abroad:—

I. Honourable Mention. "Bear and Ragged Staff,"—The Beauchamp Chapel, Warwick: Harold Brakspear.
II. "Enitor,"—Church of St. Mary the Virgin, Ketton, Rutland.
III. Honourable Mention. "Esse quam videri,"—Christchurch Priory, Hants: C. B. Hutchinson.
IV. "Moravia,"—Elgin Cathedral, N.B.
V. "Saxon,"—Llandaff Cathedral.
VI. Medal of Merit. "Stamp,"—Barfreston Church: D. J. Blow.
VII. Medal and £10. 10s. "Tysoe,"—Compton Wynyate, Warwickshire: Heber Rimmer.

The Soane Medallion and 50*l.* for Travel, for the best Design for a Technical College (not awarded):—

I. "Anon.": Arthur Jemmett.
II. "Crafts."
III. "Dum spiro spero."
IV. "Edwin."
V. "Fortuna sequator": A. W. Hoskings.
VI. "Ignis fatuus."
VII. "K."

I. and V., 25*l.* are awarded each, under certain conditions, for foreign travel.

The Pugin Travelling Studentship, Silver Medal and 40*l.* for travel in Great Britain and Ireland, and study of Mediæval Buildings:—

I. Mr. A. E. Bartlett.
II. Mr. Detmar J. Blow, Medal of Merit.
III. Mr. S. Greenslade (successful candidate).
IV. Mr. A. H. Hart, Associate.
V. Mr. W. Percival.

The Godwin Bursary, Silver Medal, and 40*l.*, for Travel and study of works of modern architecture abroad. Not awarded.

I. Mr. S. Townsend had not complied with regulations.

The Owen-Jones Travelling Studentship, 50*l.* per annum for Two Years, for the study of ornament and coloured decoration:—

I. Mr. A. T. Bolton, Associate.
II. Mr. Francis W. Bedford (successful candidate).
III. Mr. Francis Masey, Medal of Merit, and 5*l.* 5s.
IV. Mr. Andrew N. Prentice, Medal of Merit, and 10*l.* 10s.
V. Mr. H. Wilson.
VI. Mr. T. C. Yates, Associate.

The Tite Prize, 30*l.* and a Certificate, for the best Design for the Staircase of a large Town Mansion according to the principles of Palladio and Vignola:—

I. "A."
II. "Ionic."
III. "A Dream of Marble Halls": Alex. Mackintosh (successful candidate).

The Grissell Gold Medal and Ten Guineas, for the best Design for the Iron Roof of a Volunteer Drill Hall:—

I. "A.R.I.B.A."
II. "Legna."—R. J. Angel (successful candidate).

Scientific Masonry Prizes, value Ten Guineas:—

I. "Supra spem spero."—Thomas C. Izod (prize awarded).

The Pugin Travelling Studentship, 1890.

List of Drawings by Mr. John Begg, *Pugin Student*:—

1 and 2. Ely Cathedral. 3. King's College. 4 and 5. Christ College. 6. Jesus College. 7, 8, and 9, St. John's College, Cambridge. 10, 11, 12, 13, 14, and 15. Magdalen College. 16. All Souls' College. 17. New College, Oxford. 18. St. Sepulchre's. 19. Eleanor's Cross. 20, 21, and 22. Whiston Church. 23. Harleston Church. 24. Higham Ferrers Church. 25. Higham Ferrers School. 26. Irthlingborough Church. 27. Finedon Church. 28 and 29. Rushden Church. 30 and 31. Kettering Church. 32 and 33. Geddington Church. 34. Burton Latimer Church. 35. Rothwell Church. 36. Raunds Church. 37, 38, 39, and 40. Islip Church. 41 and 42. Lowick Church. 43 and 44. Oundle Church. 45, 46, 47, and 48. Warmington Church. 49 and 50. Cotterstock Church. 51. Peterborough Cathedral, Northamptonshire; a book of rough sketches; rubbings from brasses in New College, Oxford; in King's College, Cambridge; and in the churches of Rothwell and Higham Ferrers, Northamptonshire.

The Owen-Jones Travelling Studentship, 1890.

List of Drawings by Mr. H. V. Lanchester, *Owen-Jones Student*:—

1. Ceilings at La Merced. 2. Ayuntamiento. 3 and 4. Doorway at S. Paula. 5. Staircase at S. Pablo. 6. Sagrario, Seville. 7. Door of Foundling Hospital. 8. Door of Mosque, Cordova. 9 and 10. Loggia. 11. Tympanum from the Alhambra. 12. Ceiling at S. Juan. 13 and 14. Tomb of Ferdinand and Isabella. 15 and 16. Tomb of Felipe and Juana, Granada. 17 and 18. Patio S. Felipe and Ayuntamiento, Baeza. 19. Ceiling of Vestibule. 20. Ceiling of Sala Capitular. 21 and 22. Wardrobe in Sala Capitular, Toledo. 23. Brickwork. 24. Lonja, Saragoza. 25. Altar Front. 26. Hospital del Rey. 27. Tomb, Burgos. 28. Picture: Titian. 29. Picture: Ribera and P. Veronese. 30. Half suit of Armour, Madrid. 31. Giralda. 32. S. Salvador. 33. S. Pedro. 34. S. Marco, Seville. 35 and 36. Mezquita Interior. 37. Patio de los Naranjos. 38. Puerta del Perdon. 39. South side of Mezquita. 40. House of Geronimo Paez, Cordova. 41. Fountain of Charles V., Granada. 42. North Transept. 43. Calle del Comercio, Toledo. 44. S. Maria, Guadalajara. 45. Torre Nueva, Saragoza.

LONDON SANITATION AND SANITARY INSPECTORS.

A PAPER with the above title was read before the members of the Association of Public Sanitary Inspectors of Great Britain, who met on the 3rd inst. at Carpenters' Hall, London Wall, the lecturer being Captain W. H. James, R.E., until recently the Chairman of the Sanitary Committee of the London County Council.

The lecturer, after pointing out that the Public Health Act of 1875, which he called "the sheet anchor of sanitary administration," had practically no application to the Metropolis, severely condemned the mode in which the first city of the empire was administered, or rather not administered, in consequence of the lack of uniformity in practice of the multifarious bodies which have administrative functions therein. The astonishment of Macaulay's New Zealander, on coming across some musty record of municipal doings in nineteenth or twentieth-century London, was pictured. He would find that not only had the Legislature excluded the vast Metropolis from benefits which in the provinces had been largely experienced from the general Act of 1875, but it had deliberately left London in its slough, when it passed, so late as 1888, a "Local Government Act." It was only by virtue of a sort of by-way and through the efficacy of a single clause of the Act (clause 16) that Londoners obtained any effective control of their City's administration. The intelligent Antipodean would expect to see London on a level, at least, with other great towns of England in its municipal government. The fact that questions of supreme importance, like the water supply, lighting, and sewering of London, were obviously best dealt with by a powerful central authority, while more local matters, such as inspection of buildings, drains, and sanitary arrangements in the various districts would only have supreme interest for local authorities, seemed to point to the desirability of adopting, as the first principle of any proper scheme of Local Government for London, a dual division of powers. The Central Authority should have legislative powers sufficient to enable it to frame by-laws, to be carried out under the direction of District Councils, responsible to the Central Authority.

Drawing upon his experience in the London County Council for illustrations of the necessity of some such dual constitution, the lecturer referred to the absence in the case of a considerable number of Local Boards of by-laws for common lodging-houses or for house drainage. Where by-laws existed, they were frequently insufficient, and in all cases they were wonderfully varied. From its position, the London County Council was more affected by public opinion than District Councils, vestries, or Local Boards could be, and it was, therefore, less likely to be guilty of acts of partiality. On the other hand, the vastness of the area it administered, and the enormous importance of the interests it dealt with, rendered it less fit to carry out local improvements than to devise them, and to supervise the particular local authority most fit to be charged with the administration of a particular locality.

Captain James then sketched the outlines of a project he proposed to bring before the London County Council upon the lines suggested. He wished to see organised a Public Health Department in the County Council, to draw up by-laws affecting the maintenance of buildings and their sanitary arrangements, to provide for water supply, lighting by gas and electricity, hospital accommodation, the regulation of slaughter-houses and noxious trades, and the special machinery that might be necessary to meet special epidemics. In such a scheme, a district sanitary staff would be charged with the administrative portion of the work in its own locality, with full scope therein, subject to the supervision of the County Council. He proposed that half the salaries of officials should be paid by the County Council and the other half by the local authorities. A number of superior offices would be created, which would afford, what was a great desideratum, the means of reward to the more able officers. He saw no reason why, with proper sanitary supervision in London, the death-rate should not be pulled down to 14 per 1,000, or even lower. All old buildings should, within a given period, be subject to the revised by-laws as well as new buildings. He would give to District Surveyors as well as Sanitary Officers a function in the Public Health Department, and he would increase the number of both. In each District Council a sub-department of health would be formed, presided over by the Medical Officer and the Surveyor, with inspectors under them to see the acts carried out.

Ignorance was the key-note of all the sanitary mismanagement in London,—ignorance on the part of the Legislature—on the part of the people, and even on the part of the members of the many Sanitary Committees in existence all over London. Such a scheme as that proposed would raise the position of the Sanitary Inspectors, who would have the County Council at their back, in combating any shortcomings of local authorities.

The conclusion of the paper was hailed with great applause by the members of the Association, and a discussion followed in which the chairman, Mr. H. Alexander, Messrs. Tidman, Richards, Grist, Grant, Green, and Fairchild took part. The proposals of Captain James were generally approved of by the speakers, but the proposal to subject the inspectors to District Surveyors, and one or two other points of detail were adversely criticised.

In reply to a vote of thanks, very cordially passed, Captain James replied to the criticisms, and explained in a little more detail his own views on sanitary matters. He would have all drains ventilated, the outlet passing not less than 10 ft. above the top of the building, the top, according to him, being not the string-course, but the top stone of the chimney-stack or other portion projecting above the roof. He would have no containers, D-traps, or bell-traps, and he would have no ventilation outlet which was not 10 ft. above any building within 50 ft. of it. The fat-interceptor he regarded as a source of danger, whatever profess onal faddists might say in its favour, and for the flushing of water-closets he would prescribe not less than three gallons of water.

Illustrations.

THE CLOISTERS OF THE FORMER CATHEDRAL, VAISON, VAUCLUSE.

THE ancient cathedral town of Vaison is most pleasantly situated among the mountains some twenty miles from Orange, and, lying so far out of the beaten track, must be little known. The population has dwindled to that of a village, and old Vaison, perched aloft on its great rock, is, like its guardian castle, ruined and deserted. The whole place is extremely interesting, though the former cathedral attracts most notice. It is a small but very perfect and complete example of Early Christian architecture, and the only later additions consist of two Gothic tombs. The cloisters, though rude, are in character with the other work, and, besides other objects of interest, contain many Roman fragments found in the vicinity.

A. Needham Wilson.

THE ANCIENT TREASURY, NÎMES.

THE view offers an example of the manner in which the houses span the streets in so many of these southern towns. Though far from equalling others in picturesqueness, it is interesting from the fact that the Renaissance remains on the left indicate the site of the old Treasury, now nearly effaced by the buildings of the *Mairie*.

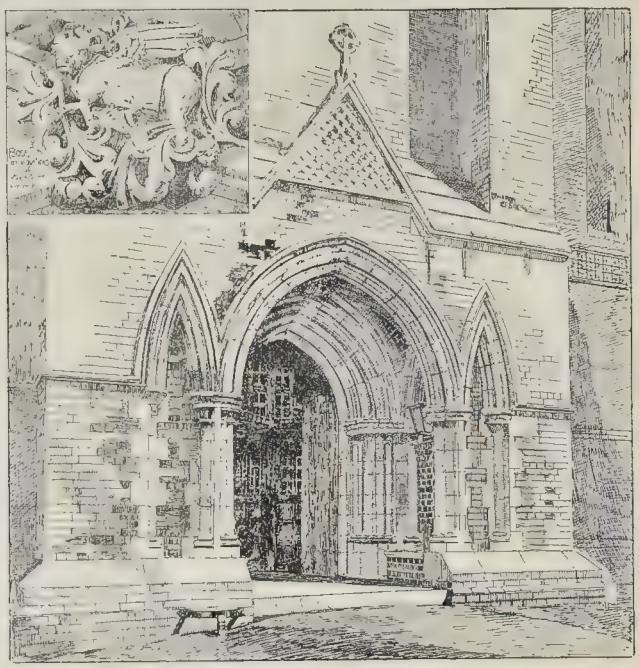
A. N. W.

ST. LUKE'S CHURCH, BROMLEY COMMON.

THE completed portion of this church, of which Mr. Arthur Cawston is the architect, was opened in April of last year. Plans were first made for the church in 1881, and the eastern portion, consisting of the chancel, vestries, organ-chamber, and sufficient of the nave and aisles to accommodate about 300 people, was commenced in 1886. This first portion was completed in June, 1887, and consecrated by the Suffragan Bishop of Dover. The church is now completed with the exception of the upper part of the tower, and it will accommodate about 800 people. The length of the entire building is about 150 ft., the choir and ambulatory occupying about 40 ft., whilst the remainder is devoted to the nave and baptistery. The width is 55 ft., of which the nave has 28 ft. clear between the columns. The tower stands at the north-west corner, and forms the principal entrance to the building. The style is the English Gothic of the close of the twelfth century, adapted to modern improvements. The apse at the eastern end, however, is an innovation, for this is a foreign feature, being found amongst English cathedrals only at Canterbury. An eastern apse is very rarely found in parish churches in England.

The building is built principally of red brick, relieved with white brick, but internally all the windows in the clearstory are enclosed by a continuous arcade of terra-cotta arches and columns. The columns to the nave are all in Bath stone of different designs; externally Bath stone is also used, but sparingly, excepting in the tower porch, of which we give a separate sketch. The paving of all the passages internally is in wood blocks, laid on solid concrete. The seats are in pitch-pine with solid backs. Special seats are provided for the church-wardens, with their respective emblems carved on the ends.

The choir-stalls, which have been added since the first portion of the church was completed, are in Canadian oak, carved. They consist of three rows on each side of the chancel, the back row being divided with arms for the elders of the choir. Two reading-desks for the clergy and a litany-stool are also provided. The pulpit, also in oak, has been made by Mr. Crossley, of Bromley, the contractor for the whole building.



West Porch, St. Luke's, Bromley Common.

As the site of the church is on a dusty main road, and public beer-shops abound, the boundary-wall is designed to contain two public seats and a drinking-fountain, as well as the usual notice-boards, &c.

Advantage is taken of the fact that the site is at the corner of two roads, and an arched gateway is placed at the angle, thus getting rid of an otherwise awkward corner.

The works have been carried out under the supervision of the architect, the builder being Mr. Thomas Crossley, of Bromley.

INNER HALL, PLAS LLANYCHAN, DENBIGHSHIRE.

IN 1881 I had to rebuild Plas Llanychan on the foundations of the former house, and finding considerable difficulty in providing space for the staircase without spoiling the sitting-rooms, I hit upon the expedient of supporting the upper part of the staircase on pillars in the Inner Hall.

This arrangement satisfied my client; but the fate of my own conceit I will relate as a caution to my brother architects against ingenuity.

Alas! it cost me a commission, for when a friend wished to recommend me it was found that I had been identified as the hitherto mythical architect who had forgotten the staircase, such having been the not very unnatural conclusion of the new owner.

Arthur Baker.

GREEN-PARK CLUB.

THIS building, occupying the site of Nos. 96 & 97, Piccadilly, is being erected for a private club by Sir Henry Brownrigg, Bart. The contractors are Messrs. Bush & Sons, and the amount of the contract 25,000*l*. The front is in Ham Hill stone, and the building is entirely of fireproof construction, on Dennett & Ingle's principle; that firm also supplying the iron-work. The accommodation consists of, on the ground floor, dining, morning, and smoking-rooms, cloak and service rooms; on the first floor, reading, writing, card, private dining, and billiard rooms; and on the upper floors there are twenty bedrooms for members. In the two basements are provided baths, lavatories, and retiring-rooms for members and staff, kitchens, cellars, stores, and offices.

The building will be lighted by electricity, and warmed and ventilated throughout by Mr. W. W. Phipson. The sanitary work will be under the direction of Messrs. Bolding & Son.

T. & F. Verity.

LONDON FOG AND LONDON SMOKE.

AT a recent meeting of the "Balloon Society" two or three papers were read on this subject. We subjoin a short *résumé* of one by Mr. Harry Assiter, in which the author is rational enough to see that London fog is not really the production of London smoke, as many doctrinaires would have us believe:—

Mr. Assiter, in the course of his remarks, said that the situation of London, lying as it does in a hollow, is favourable to the production of fogs, and enjoys the full benefit not only of fogs produced on the spot, but also of those which are formed on the higher districts around for a considerable distance out, and which gravitate down, as it were, into a basin. There was no doubt that so long as London existed it would be the victim of fogs; much, however, could be done to lessen the evils and unpleasantness resulting from them, by preventing their contamination by the vapours and particles of carbon resulting from the imperfect combustion of fuel,—chiefly coal, the burning of which, especially by the methods at present in use, resulted in the production of free carbon in large quantities. The remedy seemed to be to more rigidly enforce the laws relating to smoke consumption, and to strengthen the hands of the authorities by the passing of other Acts, which might deal more especially with the nature and manner in which fuel should be consumed. It had been suggested that the open fireplace should be done away with, and houses warmed by a central heating chamber provided with a smoke-consuming apparatus. The speaker thought it would be a long time before the English people would be induced to give up the open fireplace; and quite properly, too, for what a source of cheerfulness and comfort it was! And it was also a great means of





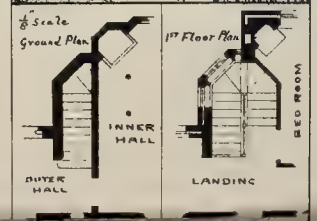
GREEN PARK CLUB AND CHAMBERS, PICCADILLY. Messrs. Thomas and Frank T. Verity, Architects.

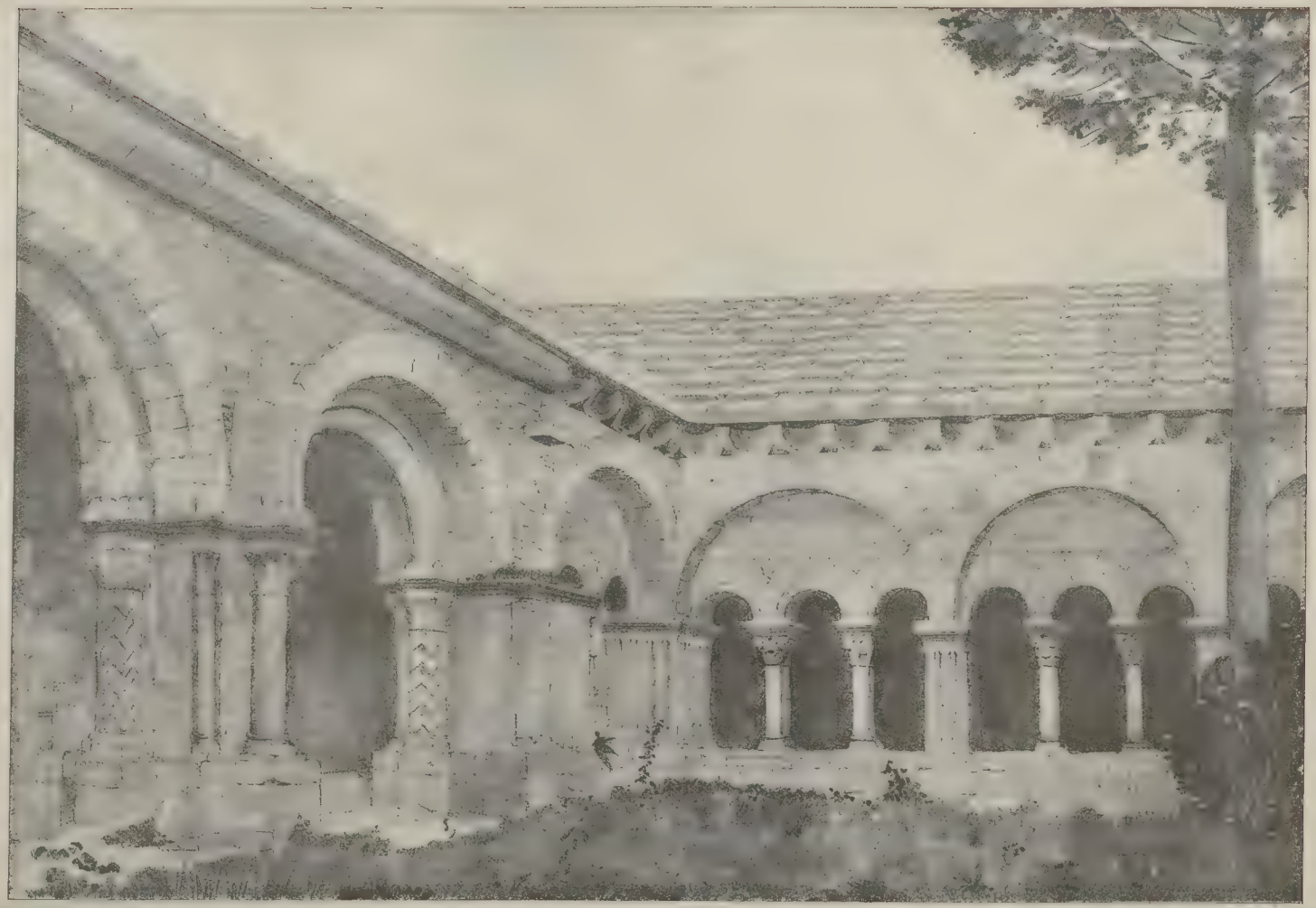
PLAS LLANYCHAN . RUTHIN
INNER HALL ARTHUR BAKER . ARCHITECT F.R.I.B.A



PLAS LLANYCHAN . RUTHIN
STAIRCASE
ARTHUR BAKER ARCHITECT F.R.I.B.A

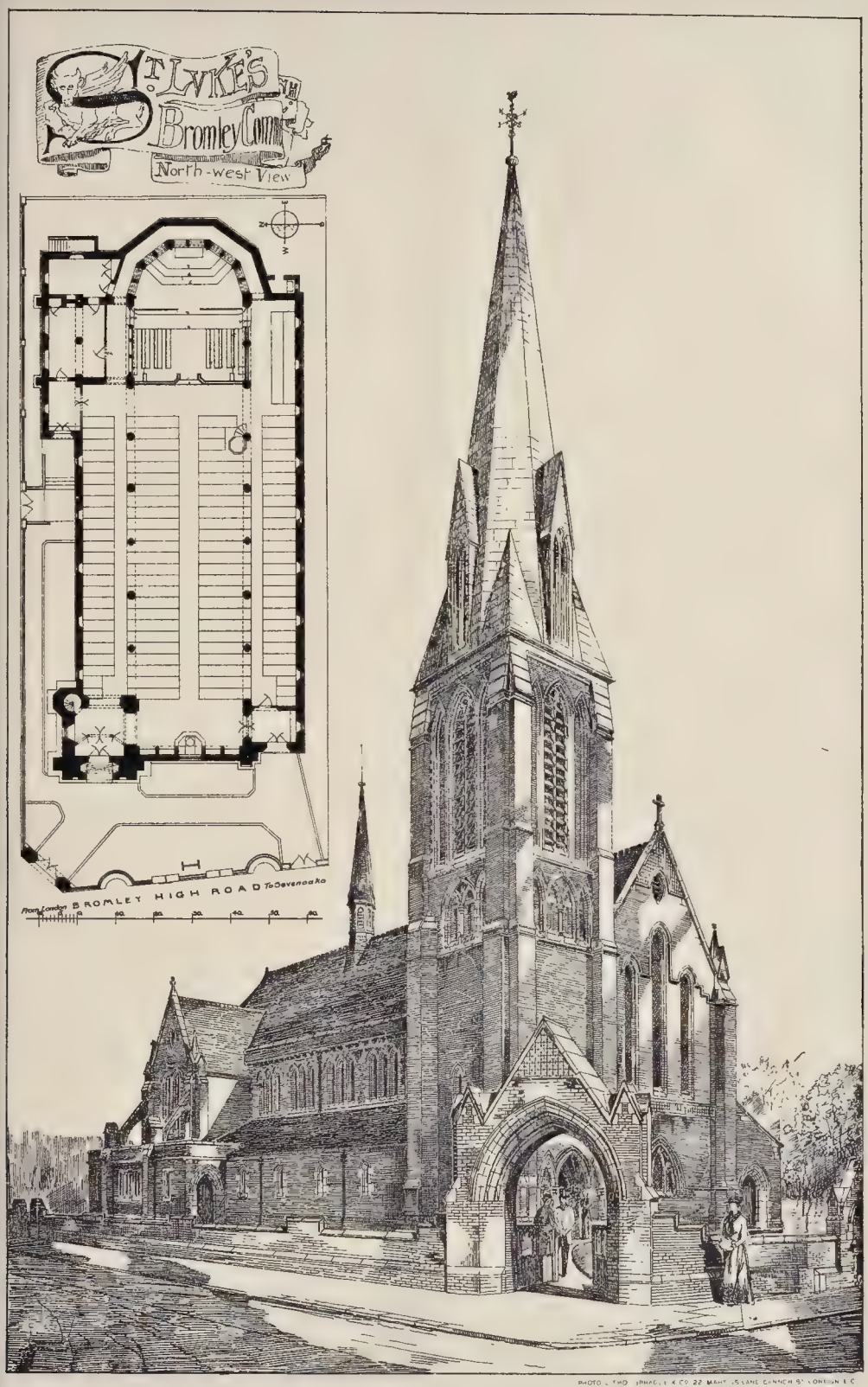








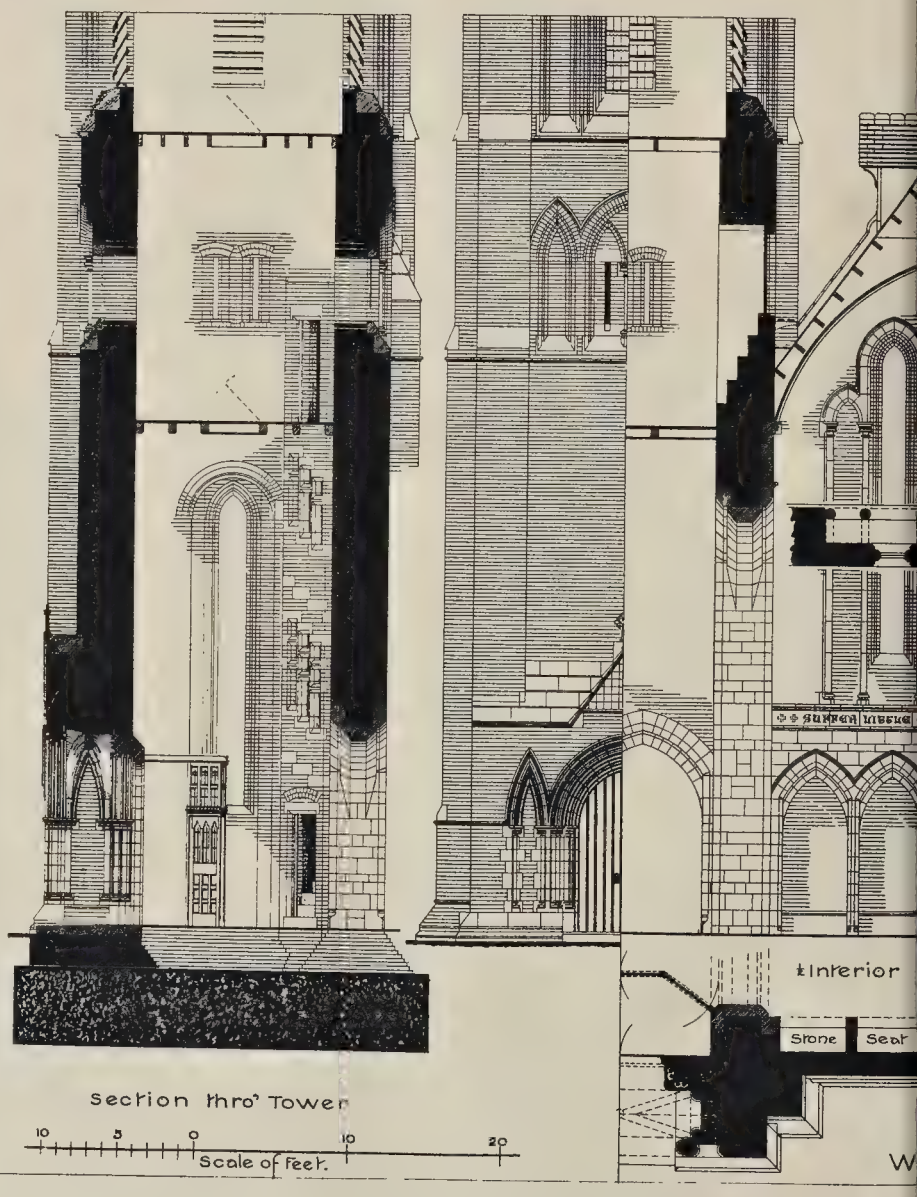
THE ANCIENT TREASURY, NÎMES.—From a Drawing by Mr. A. Needham Wilson, A.R.I.B.A



Mr. Arthur Cawston, A.R.I.B.A., Architect.

St. LUKE'S CHURCH, BROMLEY COMMO

Mr. ARTHUR CAWSTON, A.R.I.B.A., Architect.





Bay of Nave

onr

PHOTO LITHO SPRAGUE & Co 22 MARTIN'S LANE NIGH ST. LONDON, E.

ventilation, which was a subject of infinite importance. He suggested a modification of the present form of open fireplace, by which the smoke would be drawn down through the hottest part of the fire and thoroughly consumed, leaving only a small quantity of comparatively harmless vapour to be discharged into the atmosphere.

COMPETITIONS.

PROPOSED PUBLIC BUILDINGS, BODMIN.—In the recent competition for public buildings, viz., large and small halls, and drill-hall, with cloak and ante-room accommodation, seventeen sets of plans were sent in, and those prepared by Messrs. Octavius Ralling & Lewis F. Tonar, of Exeter, have been selected. The competition was limited to the architects of Devon and Cornwall.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—At a meeting of the Liverpool Architectural Society on the 12th inst., Mr. T. Mellard Reade (the President) read a paper entitled "Slates and Slating." The subject was first treated scientifically, and the nature of slate rock explained. It was shown that the property of slaty cleavage was impressed upon the rock, being the effects of lateral pressure aided by chemical action. Slates, unlike flaggy rock, split quite independently of the bedding or planes of deposition of the fine sediment constituting the material out of which slate rock is elaborated in Nature's manufactory. Slating was next considered as an art, and the best method of obtaining a sound and watertight roof treated fully and technically. Thick and heavy slates were recommended for exposed situations, and the relative merits of tiles and slates compared and contrasted. The paper concluded with a chapter on "How to put slates on a roof." The usual discussion followed.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of this Society was held at the School of Art on Tuesday evening last. Mr. F. Fowler, the President, was in the chair, and there was a good attendance of the members, including Messrs. C. J. Innocent (Vice-President), C. Hadfield, E. M. Gibbs, W. F. Hemsoll, J. F. Wightman, T. Winder, H. W. Lockwood, E. McDougall, and others. An important communication from the Royal Institute of British Architects was read on the subject of the Institute Examinations, and the President stated that the Council of the Society were giving the whole subject careful attention. Mr. Fowler then explained the steps that had been taken by the Council in regard to the new Corporation By-laws. He went carefully through the notes taken at the meeting on November 17, on which day a deputation from the Society, consisting of the President, Vice-President, Messrs. C. Hadfield, J. B. Mitchell-Withers, and E. M. Gibbs, waited by appointment at the Town Clerks' Office on the Chairman of the Improvement and Highway Committees, the Town Clerk, and the Borough Surveyor, and had a lengthened and friendly conference on the question. A discussion ensued on the points raised by the deputation at the interview, and the replies communicated to the Hon. Secretary by the Town Clerk. It was decided to print for circulation amongst the members of the Society a memorandum embodying what had taken place. The meeting was brought to a close with a vote of thanks to the President and Council for their labours in conducting the negotiations, which had involved a considerable amount of time and labour.

THE LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. E. Renard, of the Leeds Academy of Painting, lectured on Monday evening before the members of this Society upon "Methods of Reproduction for Illustrative Purposes." Mr. W. H. Thorp presided, and Mr. Renard was heartily thanked for his lecture.

NORTHERN ARCHITECTURAL ASSOCIATION.—The first annual exhibition of sketches by members of the Northern Architectural Association Students' Sketching Club was held on the 12th inst., in the Grand Assembly Rooms, Newcastle. Mr. W. S. Hicks, President of the Association, occupied the chair. The sketches numbered some hundreds, as well as many photographs. The President, in opening the proceedings, said he had to congratulate the members on the show they had made, for there was there material for a great deal of careful examination and instruction, and a promise of great material for the future in successive meetings of that kind. Mr. W. H. Knowles delivered an address on sketching, the uses and advantages of sketching, the art of sketching, and how to sketch. It is intended to hold the exhibition annually.

GLASGOW ARCHITECTURAL ASSOCIATION.—A meeting of this Association was held on the 6th inst., when a paper on "Roofs" was read by Mr. Robert Miller. The president, Mr. William J. Anderson, occupied the chair. The subject was considered chiefly from a practical standpoint, and the different types of roofs, both of timber and metal, were illustrated by drawings. Mr. Andrew Black opened the discussion which followed, at the close of which the customary vote of thanks was passed to Mr. Miller.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting of this Association on Wednesday, January 7, Mr. J. W. Grover, F.S.A., in the chair, Mr. Lindley reported the discovery of two stone bowls, which have recently been found at Ancaster. They are circular in form, and have been mistaken for quern stones. Their moulded faces, and the absence of the holes for grinding, show that they had not been so used. They were probably bowls for receiving offerings. Mr. Bodger exhibited a curious series of antiquities, many of which were dug up at Eastgate, Peterborough. Mr. Loftus Brock, F.S.A., exhibited impressions of a great many early seals, among which was one of a Royal seal of Edward II., for marking bales of wool in Essex. Mr. Macmichael described a large quantity of relics of Old London, which have just been found in Copthall-avenue, one of the most curious being a Roman nail, 18 in. in length. Mr. Geo. Payne, F.S.A., described a remarkable Dene-hole which has just been discovered at Plumstead, Kent, in the field in which a Roman sarcophagus was found a few months ago. It has been thoroughly cleared out by Mr. Dawson, the proprietor, and it proves to be 60 ft. in length. An enormous quantity of bones of animals and a few human bones, were found. The age of the excavation proves to be Roman or earlier, since Roman pottery was discovered. A paper was then read by Mr. Payne on Mr. Henry Durden's collection of antiquities preserved at Blandford, Dorset. It consists almost entirely of objects found in the locality, there being fifty ancient British urns discovered in tumuli. Some of these are of curious form, and one has a cross on the base inside. The objects of Roman date are about 1,000 in number. A large number of drawings of the articles were exhibited, and Mr. Payne reported the intention of the owner to publish them. The second paper was by Mr. Carmichael, and had for its subject the signs of the old trading houses of London, western portion. Their history was treated in an exhaustive manner.

ENGINEERING SOCIETIES.

THE INSTITUTION OF MECHANICAL ENGINEERS.—The forty-fourth annual general meeting of this Institution will be held on Thursday evening, the 29th, and Friday evening, the 30th January, at 25, Great George-street, Westminster, by kind permission of the Council of the Institution of Civil Engineers. The chair will be taken by the President, Mr. Joseph Tomlinson. The Annual Report of the Council will be presented to the meeting on Thursday. The annual election of the President, Vice-Presidents, and Members of Council, and the ordinary election of new Members, Associates, and Graduates will take place at the meeting on Thursday. In accordance with the notice given at the last general meeting, the following motion will be proposed as a new By-law on Thursday by Mr. J. Macfarlane Gray:—

"When the total annual subscriptions paid by any Member amount to thirty annual subscriptions of 3*l.* each, he shall thereafter be declared a Life Member of the Institution, entitled to all the benefits of membership without any further payment to the Institution."

The following Papers will then be read and discussed, as far as time permits:—"On some different forms of Gas Furnaces," by Mr. Bernard Dawson, of Malvern; "On the Mechanical Treatment of Moulding Sand," by Mr. Walter Bagshaw, of Batley; and "Fourth Report of the Research Committee on Friction: Experiments on the Friction of a Pivot Bearing."

BIRMINGHAM ASSOCIATION OF ENGINEER STUDENTS.—The annual dinner of the Association of Birmingham Students in connexion with the Institution of Civil Engineers was held on Monday evening at the Midland Hotel. Mr. E. Pritchard, M. Inst. C.E., President of the Association, was in the chair; and among those present were Messrs. R. Godfrey (vice-president), J. E. Willcox, H. R. Austin, S. R. Barrett, Seaward, S. Kenworthy (Handsworth), G. E. Jenkins (Aston), H. Richardson (Oldbury), W. H. Robbins, S. R. Lowcock, and Bernard Godfrey (Droitwich), hon. secretary.—Mr. H. R. Austin proposed "Municipal Institutions."—Mr. R. Godfrey, in responding, said that municipalities had a good deal to learn yet. One thing was the removal of snow from the streets.—Mr. Kenworthy proposed "The President and Vice-presidents."—The President, in responding, referred to the municipal aspects of engineering, and said that their Association had now been in existence several years, and had made considerable progress. When he first joined the parent institution—the Institution of Civil Engineers—that body had 1,354 members and only 82 students; now it had 5,953 members of all classes, and 927 student members. Its members were not found in England only, for the most eminent engineers on the Continent, in Japan, in China, and in our colonies, even the most distant, were proud to be associated with it. For students the Institution was doing a great and a noble work, and the Birmingham Association was one of its most successful branches. They had had read by Birmingham students able and instructive papers, which he had no hesitation in saying were superior to many of the papers read by members of the Institution. It was only by assisting the younger members of the profession that the members of the Institution could hope to maintain the pre-eminent position of the parent body, and that was why he was happy to be President of their Association, and to do all he could to further its prosperity.—The toast of "The Association" was proposed by Mr. Lowcock, and responded to by Mr. A. W. Pritchard and Mr. G. L. Till.

Correspondence.

To the Editor of THE BUILDER.

VENTILATORS TO SOIL-PIPES.

SIR,—One of the champions in this discussion has retired from the field, and his partner now takes his place.

He, Mr. William Sugg, states on p. 35 that:—"Mr. Buchan has not been as just towards us as he should have been."

Instead of that being the case, the fact, as I shall show, is that they have been acting unfairly both to me and to the public.

On November 23, 1889, Mr. J. F. Simmance made an application No. 18,801 for provisional protection for a patent, the specification of which is now published. From it we see that as per figs. 1 and 2 below he desired to patent and claim as a new idea the placing of a light or balanced valve upon the top of a ventilating pipe inside of an exhaust ventilator. This valve, he says, is to be of "sheet-iron, tin, asbestos card, or tale," &c. In fig. 2 this valve T is a dead-weight upon the top of the pipe U, and works up and down on the spindle or guide R. In case this valve T would be too heavy for the air to lift, Mr. Simmance, as per fig. 3, shows a mode of balancing it by a weight M on a lever, and with *two* working centres K and L.

On January 25, 1890, Mr. W. T. Sugg lodged an application for another patent, No. 1,346, for a fixed exhaust ventilator as per V, fig. 1, in sketch

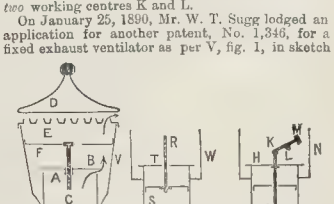


Fig. 1. *Fig.* 2. *Fig.* 3.

of it here given. In this ventilator a disc-valve B is shown, with a small tube A in its centre, which valve lies on the top of the pipe G, and has to be lifted by the outgoing air.

A Glasgow architect having got a circular lauding

the wonderful powers and benefits of this ventilator, one was ordered, but when it came to hand, lo! and behold, neither of the styles of valve shown above was in the ventilator, but instead the top of the pipe was cut away on the level, and a balance-valve, working on only one hinge, was inside, in the style of an old patent of mine dated July 9, 1878. Figs. 4 and 5 here given show two of the styles in this old patent.

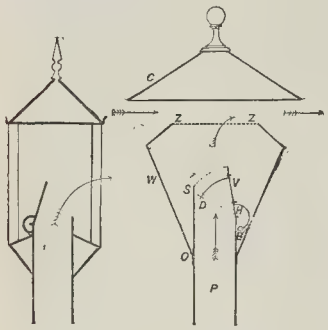


Fig. 4. *Fig.* 5.

When I saw this valve inside of a cowl with "manufactured under two patents, Sugg and Simmance," I, while proud of the honour of my old valve being thought worthy of *two* new patents, naturally wrote to Messrs. Sugg & Co., asking the No. and dates of these two patents, but could not get such from them. (Thanks, however, to the "Recent Patents" column of the *Builder*, I got the information independent of them a few days ago.) I then wrote to the papers, stating that it was too late in 1890 for anyone to claim as a novelty or to patent the adaptation to the top or outlet end of a ventilating shaft, an air-acted valve, so as to stop down currents while rising or opening with up currents. I have also intimated that *this principle is now public property*, as are now the valves shown in figs. 4 and 5, and the modifications of same in my 1878 specification. Fig. 42 in this old specification shows the whole of the vitiated air from off the gas lights in a house being led up by pipes to a ventilator with a balanced valve in it, as per fig. 4 above, so that Messrs. Sugg's and Simmance's 1890 ideas in this relation were anticipated by me, and given to the public a dozen years ago?

I then stated that the top of the pipe inside of the ventilator might be fitted with a valve or valves, "and counterbalanced so as to act automatically, and open with the slightest draught upwards, and close when that ceases, or with the least back draught."

As this valve ventilator was not suitable for placing on the top of soil-pipes, and when in position it would often be difficult to know whether it was working or not, I afterwards patented a different arrangement of self-acting valves, which, when placed in position, could generally *be easily seen, and the working examined*, without interfering with anything. It is these I have been supplying to the public for years back for all sizes of pipes. When Messrs. Sugg & Co., therefore, issued their valve ventilator "for soil-pipes," without any information as to how it was to be used for such, I consider that I was quite justified in sending in a caution against the use of such, on account of danger from siphonage. Mr. Sugg, on page 34, tries to excuse himself for this omission; but it was his place, and not that of "architects," to show how this unusual style of ventilator could properly be used for either ventilating or "covering" soil-pipes.

On page 34 Mr. Sugg says:—"The object which I and Mr. Simmance have always had in view is to ventilate soil-pipes by means of a continuous current of fresh air always moving in the same direction, in a manner to prevent sewer-gas from getting into the soil-pipe."

Now, I do not at present believe that they had any such idea or "object" until after the letter from me, which appeared on page 372 of the *Builder* for November 8 last. If they had had such, they ought to have mentioned it in their printed circulars.

This discussion has now drawn from Mr. Sugg the illustration on page 34, entitled "Section illustrating Mr. Sugg's System of House-drain Ventilation." It so happens, however, that this is the "system" illustrated by fig. 22 on sheet 2 of the drawings in the specification of my patent of 1883, and of which fig. 311 in the fifth edition of my text-book on Plumbing and House Drainage gives a skeleton sketch. Fig. 6 here shown is said skeleton sketch, *showing the air and water both going in the same direction*. I have sometimes carried this out in practice.

The illustration on p. 34 from Mr. Sugg is not exactly like fig. 6 above, but it is similar to the full-page illustration on p. 222 of my book on plumbing, but slightly altered to show the air and water both going the same way, as indicated in fig. 6 above. The diagram on p. 34 appears to me to have been drawn or designed by a person having a

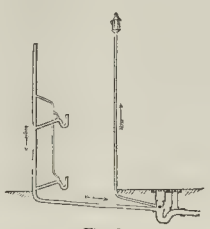


Fig. 6.

very superficial knowledge of plumber's work, or he would not, in this case, have shown the three branch air-pipes led separately out through the wall; but would have shown them as per fig. 6 above.

As Mr. Sugg has drawn them, the soil-pipe, especially if on a wall facing the south, would *not* be acting generally as a down-current fresh-air inlet for the drain; but, instead, the lowest branch air-pipe would often supply fresh air to go up the soil-pipe as well as to go along the drain. In calm weather the weight of Mr. Sugg's valve would sometimes or often prevent the foul air getting out of his ventilator, so that my No. 1 ventilator in fig. 6 —preferably without any valve in it—would often be acting as intended when Mr. Sugg's in the diagram on p. 34 would not.

I tested a 4-in. vertical pipe, 6 ft. high, with a candle burning near its foot. The air passed in full bore at 170 ft. a minute. When I placed a 4½ in. light mica disc on the top of the pipe the current was stopped. I then placed the Sugg's 4 in. cowl, with balanced valve, on it, allowed 2 ft. in the first minute up the pipe, and then the anemometer stopped. I then put on one of my own 4 in. self-acting valve-boxes in the style shown in fig. 90 of my new text-book on ventilation; the air went up the pipe at 160 ft. a minute. These experiments clearly show that a valve inside a ventilator on the top of the pipe, as shown by Messrs. Sugg & Simmance, would often stop a considerable current in an upcast shaft, and, especially in calm weather, would render a ventilating shaft useless which, if there were no such valve on its top, might let out a considerable amount of air.

I think that I have said sufficient to prove that whatever "injustice" has been done in this case has been by Messrs. Sugg & Simmance not merely to me, but to the public also. W. W. BUCHAN.

CANTERBURY CATHEDRAL.

SIR,—Having enjoyed the advantage of a visit to Canterbury at Christmas, may I point out that in one particular the ground-plan published by you is not quite up to date? The Chapel of St. Anselm, on the south side of the choir, has quite recently been undergoing restoration, and the mass of masonry shown on the plan, which forms a chord to the north side of its apse, has been removed. The result has been the uncovering, not only of a Norman window-opening flanked by the rebuilding of the choir, but also of an interesting mural painting, built up for centuries by the ancient stonework. The apse can now be seen in its entirety, the restoration having, I was informed, been undertaken by one of the Canons of the Cathedral.

Your plan is, no doubt, an exact copy of that made in 1883, and there may, therefore, be other points in which it does not now precisely represent the structure. Personally, I could wish that it did not stop off abruptly on the north side, as there are many most interesting remains extending from the Cathedral in this direction.

The English "Baedeker" gives some of these, but it is a fault of most Cathedral plans that they show the church, and that alone.

R. LANGTON COLE.

*** We specially mentioned that the plan was Mr. G. Smith's, made in 1883. It is better for our purpose as it is, as showing an alteration that was made long ago. As to the latter portion of Mr. Cole's letter, we are only undertaking to give the plans of the cathedrals, the object of the illustrations being architectural rather than archæological.

WESTMINSTER ABBEY.

SIR,—There is no reason at present why this church should be enlarged, improved, or otherwise disfigured to accommodate memorials of the dead.

The west aisle of the south transept over the east corridor of the cloister forms a gallery, with the church, 60 ft. by 20 ft., which would form an annexe to the poets' transept. And the whole of the triforium over the aisles, which is well-lighted and covers half the area of the church, would, at least, answer for tablets, busts, relievos, and statuettes. Some of the existing monuments of this sort might be removed there. The best interior views can be seen from these galleries, which ought to be opened to the public.

WALTER SCARGILL.

DANGERS IN THE STREETS.

SIR,—It seems to me that the sky-signs now in vogue are attended with so much danger that the London County Council should require their immediate removal, as being unjustifiable, unsightly, and dangerous. Many of the signs are 50 ft. long, and one I have seen figured was 90 ft. high from parapet, and though strong enough, it may be, under ordinary circumstances, yet a gale of unusual violence, or heavy fall of snow might bring them down. But the greatest danger would be in the case of fire. Fancy the crash of one of these monsters coming down with the roof, heavy laden, and with its long lengths of iron-wire dashing about! The loss of life would probably, amongst firemen and crowd, be very great. Why should they be permitted? I think, too, it would be well for the L. C. C. to repress the huge lamps that publicans hang over the pavement. At one time these things, I believe, were only allowed if suspended over their own premises, but now there is no restraint. In Holborn you may see a group of them; some, of great size, are half-way across the pavement. They do not appear to me secure, but are an imminent danger to the passers by.

Another matter deserving attention is the iron coal-hole plates. These, when first put down, are probably line-indented, and laid level with the pavement; but in course of time the stone around wears down, and the iron becomes quite smooth, so that they are a constant cause of slipping with London unctuous mud on them, and still worse in times of frost and snow. I should propose their entire removal and stones substituted, or iron frames filled in with concrete. These are matters, it seems to me in the interests of the public, requiring attention. PHILIP E. MASEY.

THE "OLD CURIOSITY SHOP," AND DRYDEN'S HOUSE, IN FETTER-LANE.

SIR,—I have read with much interest the "Note" on the above subject in your last issue, as well as the remarks which have appeared in other papers. Having known Fetter-lane for many years, I do not consider there is any justification for supposing that the house, No. 24 (now about to be pulled down) is the original of Dickens's "Old Curiosity Shop," although, of course, he may, in his early years, have been a frequent visitor there, in company with other literary men. My recollection is that the sale of curiosities is a comparatively recent addition to what in former years—say in the early forties—was a periodical and small printing business, with a lending library attached. Nor do I think it can claim to having been the abode of the poet Dryden; this distinction properly belonging, in my opinion, to the house No. 16, now demolished. Curiously enough, it was in this house that I first drew breath; and, although this does not give me the right to speak authoritatively on the matter, I may say that it has always been understood among my relatives,—certainly long before the tablet was put up,—that the place had at one time been the poet's home. I had a photograph taken of the house just before it was pulled down, and the lions' heads and quoins, to which you refer, are plainly shown. It may, perhaps, be interesting to mention in this connexion that the place was some years ago a beerhouse, with the sign of "The Three Lions." Until some very strong evidence is adduced to the contrary, I shall always regard No. 16 as the house in which lived

"GLORIOUS JOHN."

January 10, 1891.

OBITUARY.

BARON HAUSSMANN.—On another page will be found an article relating to the late Baron Haussmann, who died on Sunday last.

MR. G. W. ORMEROD.—The *Athenæum* announces the death of Mr. George Wareing Ormerod, of Teignmouth, who died last week, aged 80. He was well known as a student of local geology, and the author of a large number of papers, especially on the granite of Dartmoor. In early life he wrote a good deal on the salt beds of Cheshire, his father, George Ormerod, having been the author of the "History of Cheshire."

MR. JOSEPH BONEHILL.—Mr. Joseph Bonehill, well known as an architectural sculptor in Manchester and neighbourhood, died on the 28th ult., aged 66 years. He was articled to the late Mr. John Thomas, and during the last thirty years executed the carving, &c., on many of the public buildings of Manchester and the surrounding district.

M. EUGÈNE DELAPLANCHE, the well-known French sculptor, died on Saturday in Paris.

M. AIMÉ MILLET, another well-known French sculptor, died on Wednesday morning.

The Student's Column.

VENTILATION AND WARMING.—III.

DRAUGHT.

LIKE an ever-present sword of Damocles, the evil of draught is a constantly-threatening danger in any attempt, however modest, to introduce ventilation. Before, therefore, we proceed to consider the simplest application of the principles we have already taken into account, it will be well to investigate the causes of draught and the precautions to be taken in order to avoid its effects.

Draught may be defined as "the unpleasant contact of moving air with the person."

All contact of moving air with the person is not unpleasant, and does not receive from us the ill-omened name of "draught." We enjoy the breezy hill-side, the blustering wind of the seashore, and the keen frost-laden air of winter, and yet the same rapidity or the same temperature of air current in a room would raise a storm of indignation against the fearful draught.

Probably the unpleasantness of draught is not alone due to the difference in extent of our indoor and outdoor clothing, nor to our lessened activity of re-action from the decreased muscular exertion, but also to the usually partial manner in which draught attacks us, thus producing unequal conditions of environment in different parts of the body. Certainly a draught which just catches one point of the person is more unpleasant than one which wraps us wholly in its embrace.

The unpleasantness accompanying draught, or the contact of moving air under certain conditions, is universally the result of reduction of temperature of some part of the person, and effects closely resembling those of draught result from the reduction of bodily temperature arising from other causes. Thus, for example, sitting in close proximity to the cold surface of an external window, we experienced a sensation exactly similar to that of draught from the absorption of the bodily heat by the cold glass surface.

Draught then, we may conclude, is felt when the temperature of the body is superficially reduced from some cause, or combination of causes.

The conditions which tend to bring moving air to the form of draught are: (1) Too great rapidity of current; (2) too low a temperature; (3) too great humidity of the atmosphere; (4) too little humidity. The first and fourth of these produce the sensation of cold by causing excessive evaporation from the skin; the second, by the increased radiation of heat from the body to warm the surrounding atmosphere; the third, by the extraction of the corporeal heat to maintain the undue suspension of watery vapour.

A rapidity of air current of 1 ft. per second is just perceptible, but 2 ft. per second is not felt to be a rapid current, though this rate should never be exceeded.

The point at which the temperature of moving air becomes unpleasant depends, to a certain extent, upon the hygrometrical state of the atmosphere. With very dry air a higher temperature must be maintained in the moving current to avoid draught, for the dryness tends to reduce the bodily temperature by increasing the evaporation from the skin, hence there is, so to speak, less bodily heat to spare for warming the air. Thus it results that, whereas in the dry atmosphere of America, it is found by experience, that a lower temperature than 70 deg. Fahr. produces the sensation of draught; in our own more humid atmosphere a temperature of 50 deg. can be borne without discomfort.

We may, therefore, take it that, with our usual hygrometric conditions of 70 to 80 per cent. humidity, our lowest limit of temperature should be 50 deg. Fahr., or a not greater difference than 10 deg. Fahr. between the atmosphere of the room and the incoming fresh air.

Too great humidity of the atmosphere produces draught, as we have already said. The peculiarly chilling effect of an atmosphere saturated with moisture we in England have ample opportunity of verifying from our own acquaintance, especially during the winter months, with mist and fog. We should, therefore, endeavour to keep our fresh air at a not greater humidity than 80 per cent.

In speaking of the moisture of the atmosphere the student will notice that we have expressed ourselves in terms of percentage of humidity. The absolute degree of moisture is not thereby meant, but the percentage which the amount of water-vapour actually suspended in the air bears to the maximum amount which the atmosphere under any particular conditions could hold in suspension if saturated. The absolute amount of water-vapour which the atmosphere can hold in suspension varies with the temperature; but the point which is of chief importance to us in connexion with ventilation is not the absolute, but the relative, amount of water-vapour, compared with saturation, which any particular atmosphere contains, and which we therefore express in percentage of humidity—that is, of saturation.

As the quantity of water-vapour required to produce saturation increases with the rise of temperature, it is evident that we can correct any excess of humidity by raising the temperature of our air supply, and, further, the unpleasant results of excessive humidity are diminished by an increase of temperature; for warmth and great humidity are more easily borne than cold and great humidity.

Too little humidity in the atmosphere, although a condition to which our English air is little subject, must nevertheless be noted as a possible cause of draught. We have already seen that from American experience, with a dry atmosphere, increased temperature must be given to the moving air. We may instance also the effect of cold produced in some African deserts by the excessive evaporation resulting from exceedingly dry air and the manner in which ice is prepared in the open in India, by utilising the dryness of the atmosphere to induce rapid evaporation. We should, therefore, endeavour, for English practice at least, to ensure a humidity of not less than 60 per cent.

We have hitherto spoken of draught as producing a sensation of cold, but we must not forget that there is such a thing as an unpleasant hot draught, which, causing at first excessively rapid evaporation from the skin, appears to debilitate its nerves and ducts, or, in popular language, drys up the skin, and so checks perspiration. Hot draught is seldom obnoxious, unless high temperature of the fresh air is combined with dryness, but, as a general rule, it is not advisable that the temperature of the incoming air should exceed 90 deg. Fahr. It usually happens that by the process of heating the fresh air to a high temperature its humidity is decreased and the organic impurities scorched so as to render the air unpleasant by what is popularly termed the "burning" of the air.

We have now investigated the primary causes leading to the existence of draught, and we must take steps to ensure that, at whatever cost, these causes may not become operative. For, unless we can effect our ventilation without draught, the public will have none of it, and it is because ventilation has so frequently, in the past, been accompanied by draught that the whole subject is looked upon with suspicion by the British public. The evil effects of vitiated atmosphere are slow and insidious, the discomfort of draught is palpable and immediate, hence our clients prefer to be stifled and slowly poisoned by foul air rather than endure the present inconvenience and illness occasioned by draught, and by what is, possibly, quite as energetic an agent, the fear of draught.

To avoid draught it is essential, as we can conclude from an investigation of its causes, that the current of moving air produced by ventilation shall be slow and gentle, of agreeable temperature, and of sufficient but not too great humidity.

We must be careful, also, that our stream of air, although in itself unobjectionable, does not set up, within the apartment, minor air currents which may themselves contravene the desired conditions and produce what we may term local draughts.

The ideal current of moving air would be one symmetrical in its sectional area with one superficies of the apartment, and passing gently and equably through the cubical space, until it quits the room at the opposite superficies; and, although such an ideal is unattainable, we should endeavour to reach as close an approximation thereto as possible.

In our next chapter we shall proceed to consider the precautions to be observed in order to avoid draught.

SURVEYORSHIPS.

CARLISLE.—At a meeting of the Council of the City of Carlisle, held on the 13th inst., it was resolved to increase the salary of Mr. W. Howard-Smith, Assoc.-M.Inst. C.E., the City Surveyor, from 350*l.* to 450*l.* per annum. Mr. Howard-Smith has held this appointment since October, 1889.

CANTERBURY.—At the last meeting of the Canterbury Town Council, the Road and Survey Committee minutes of December 19 were read. The Committee recommended that the Surveyor's salary be increased to 300*l.* a year. This was agreed to by the Council.

GENERAL BUILDING NEWS.

PROPOSED PUBLIC HALL FOR NEWCASTLE.—A meeting of the Newcastle Town Hall Sites Committee was held on the 6th inst. to consider certain proposals made by Mr. Farquhar M. Laing, a merchant of Newcastle, with respect to a new Town Hall for the city. Mr. Laing's plan, which, he claims, would effect a saving to the city of some 200,000*l.*, is to lease for a term of sixty years the New Market, which is bounded by Grainger-street and Clayton-street on the east and west, and Nelson-street and Nun-street on the north and south, to take down the interior buildings, and to erect on the site a City Hall, 200 ft. by 100 ft., in the French Renaissance style, with sitting accommodation for six thousand people at concerts and similar gatherings, and which for political or other public gatherings could afford space for some ten thousand people. The shops in the four surrounding streets named would be left untouched, but the whole of the interior portion of the markets would be devoted to the new building. The plans, which have been prepared by Mr. R. J. Leeson, of the firm of Messrs. Oliver & Leeson, Newcastle, show surrounding the hall a row of shops on the ground floor, and on the first floor retiring, refreshment, and dressing-rooms, lavatories, and other conveniences. The floor above would be devoted to a suite of art galleries, 700 ft. in length, lighted from the roof, and arranged in sections, to enable them to be used for either large or small exhibitions. The space between the building and the surrounding premises it is proposed to cover with an arcade, 30 ft. wide. The hall will be provided with a dozen entrances, averaging 12 ft. wide; and the greater part of the audience would be accommodated on the ground floor. Mr. Laing offers, during the term of his tenancy, to pay the Corporation practically the same rental that they are now receiving from the markets; and at the end of the sixty years to hand over to them the hall, as well as the other property attached to it. It is further suggested that the present Town Hall could, for an expenditure of some 30,000*l.*, be converted into a fine block of municipal offices. The plans relating to the proposals were exhibited in the committee-room. After some conversation it was resolved that Mr. Laing be requested to make a formal application with respect to his proposals in accordance with some suggestions made by the Committee.

NEW BOARD SCHOOLS, GUILDFORD.—Messrs. Morgan, Isted, & Morgan, contractors, of Southampton, have, we understand, secured a contract under the Guildford School Board for the erection of new schools in that town. The architect is Mr. W. G. Lower, of Guildford.

VOLUNTEER QUARTERS, LEEDS.—On the 3rd inst. the new quarters for the non-commissioned officers and sappers of the Second W. Y. V. Royal Engineers was opened. The building has been designed by Mr. William Bakewell, architect, Leeds, and the work has been carried out by Mr. Pullan, builder.

MODEL DAIRY SHOP, BALHAM.—There has lately been opened, opposite Balham Railway Station, a new model dairy shop, being a portion of a scheme to form an improved dairy farm for Mr. Curtis, of West and Manor Park farms, near Epsom. At the side of the shop is a boldly-carved archway giving access to a corridor, lined with various coloured glazed bricks, leading to the farm buildings in the rear. The building has been erected of Leicestershire pressed red bricks with Portland stone dressings and marble finish round shop front. The floor is of marble slabs, whilst the walls have been fitted up with specially designed tiles, forming dado, frieze, and panels. In the centre of the two vacant walls is placed a large picture, one representing the farm near Epsom, and the other the park lands adjoining, each signed by the lady artist who did the work, and the whole has been executed by Messrs. Doulton & Co., of Lambeth. The fittings are of substantial construction, of polished walnut with bevelled silvered glass panels and marble slabs. The ceiling and cornice are also of panelled walnut, with an improved Doulton-ware Wenham ventilating light in the centre. The upper panels of shop front are filled with stained glass. Adjoining the farm buildings a heated conservatory has been erected for the express purpose of furnishing the shop with palms, ferns, &c., for decorative purposes. The whole has been carried out by Mr. W. Johnson, builder, of Wandsworth Common, from the designs and under the supervision of Mr. J. Nixon Horsfield, architect, Kingston-upon Thames.

NEW BOARD SCHOOLS, BROMLEY, KENT.—The new schools in Raglan-road have been commenced. All three departments are on the ground floor, the schools for boys and girls occupying the front of the site, and are exactly alike, each containing a large room for 150 children, divisible into class-rooms of forty, fifty, and sixty respectively, with two separate class-rooms, one for forty, the other for sixty children. The girls' department has in addition a cookery class-room. The infants' school in the rear accommodates 150, with a babies' room for fifty. All the departments have conveniently-arranged corridors, lavatories, cloak-rooms, &c., with spacious playgrounds, in one of which there is a house for the school-keeper. The works are being carried out by Mr. Grubb, builder, of Bromley, Kent, at a cost of over 7,000*l.*, from bills of quantities prepared by Mr. Henry Lovegrove. The design was selected in competition, and is being carried out by its author, Mr. Charles Bell, F.R.I.B.A.

MEMORIAL AT KNOTTY ASH CHURCH.—The parish church of St. John the Evangelist, at Knotty Ash, Lancashire, has just received two additions in the shape of memorial gifts. The first is an organ-screen of carved English oak, dividing the western side of the instrument from the eastern end of the north aisle. The other gift takes the form of oak panelling in the eastern end of the south aisle. In recessed panels, on the north and south, are sculptured representations of the four doctors of the ancient Church—SS. Jerome, Ambrose, Augustine, and Gregory. The additions are the work of Mr. Harry Hems, of Exeter. They have been carried out from the designs and under the personal supervision of Messrs. Aldridge & Deacon, of Liverpool.

TRURO PUBLIC BATHS.—The Truro Public Baths, situated near the Cathedral, have just been opened to the public by the Mayor, Mr. A. Laverton. The swimming-bath is 48 ft. by 27 ft. The private baths occupy separate rooms, and are of solid porcelain, fitted with Busby's patent valves. A 12 horse-power vertical boiler supplies the hot water to the baths, and there is sufficient reserve power for future extension. The masonry work has been carried out by Messrs. Clemens, of Truro; the iron-work, fitting, and engineering by T. Bradford & Co., Manchester and London; and the architect is Mr. S. Trevail, of Truro.

NEW BOARD SCHOOLS, CARDIFF.—The new schools, built by the Cardiff School Board in Moorland-road, were opened on Tuesday last by Alderman Sanders. The schools consist of two separate buildings, and the style of architecture adopted is Gothic, freely treated. There are ventilating turrets on both the buildings. The materials used in the construction are local stone and brick. The elevations are carried up in blue Pennant stone, with freestone and Ebbw Vale buff brick dressings. Three large playgrounds are situated at the back of the main buildings. The schools are arranged on the central hall system, each standard having a separate class-room, whilst the central hall is only used for assembling and drill. The warming is effected by slow-combustion open fireplaces. The internal woodwork is of pitch pine, stained and varnished. All the rooms and corridors have a dado of narrow match-boarding, 4 ft. high. The schools will accommodate 380 boys, 380 girls, and 480 infants. The whole of the work has been carried out by Mr. C. C. Dunn, Cardiff; and Mr. Evans has acted as clerk of the works. Messrs. W. G. Habershon & Fawckner, of Cardiff, were the architects.

NEW UNITED PRESBYTERIAN BUILDINGS, DUNDEE.—The Dundee United Presbyterian Presbytery have just converted their previous existing house into a hall, 40 ft. by 30 ft. inside. The old building has been entirely gutted out, and a new open roof, floors, windows, and stone-built porch, with double exit doors, have been substituted. The interior walls are timber-lined to the height of 4 ft.; the walls and open roof, with the main framed couples shown inside, are plastered. The hall is heated by stoves. A small vestry and class-room adjoin the main building. The alterations and additions have been made from plans by Mr. Campbell Douglas, Glasgow, under the personal supervision of Mr. R. Hunter, Dundee, at a cost of 500*l.* The contractor was Mr. Andrew Brebner.

ST. MICHAEL'S CHURCH, LICHFIELD.—The restoration of this church has been completed, and the re-opening was celebrated by a special service on the 8th inst. In the chancel the three lancet windows over the altar have given place to a reproduction of the old Perpendicular window which was destroyed forty-five years ago. At present the window is filled with plain glass. The jambs of the window in the south wall of the sanctuary have been brought down to form sedilia. Just beyond the window a credence niche has been made in the wall. The other windows have been left as they were, although, when the plaster was stripped off the walls, the lines of former windows of the Perpendicular period were discovered. One of these former windows, built up when the vestry and organ loft were erected, has been opened out to allow the organ to face into the chancel. The former vaulted plaster ceiling has been replaced by an oak roof in the Decorated style. A recumbent effigy, supposed to be that of a William de Walton, a citizen of Lichfield, and of Edward III.'s time, was discovered in its position in the north wall, and has been restored. With regard to the tower, the walls and spire have been repaired. The architect was Mr. J. O. Scott, and Mr. R. Bridgeman, of Lichfield, has carried out the work, under the direction of a Restoration Committee.

NEW BOARD SCHOOLS, NEWCASTLE.—The new Board Schools at Todd's Nook, Newcastle, were formally opened on the 5th inst. by the Mayor, Mr. Joseph Baxter Ellis. The schools have been erected in accordance with designs prepared by Messrs. Dunn, Hansom, & Dunn, of Newcastle, and have been built by Messrs. T. & R. Lamb, Gateshead, at a cost of about 11,000*l.* The buildings afford accommodation for 1,200 children. The ground floor comprises the infant school, in which there are five class-rooms, separated by glass screens; teachers'-rooms, committee-rooms, lavatories, and covered-in playgrounds. The upper floor is reached by means of two staircases, which are formed of oak treads, with the ends built into the walls. On this floor are ten class-rooms and a school-room, measuring 84 ft. by 34 ft. The east wing of the building forms the boys' and the west the girls' school, and there is a separate entrance to each from the respective playgrounds. These playgrounds are laid in cement. The flooring is throughout of wood blocks. Glazed brick dados run round the entire building. The heating and ventilating work has been carried out by Messrs. Henry Walker & Son. The schools are built of stone from Kenton Quarry, and the windows are Millar's patent reversible frames. Mr. Wm. Walker acted as clerk of the works.

NEW BIRMINGHAM MEAT AND PIG MARKETS.—At a meeting on the 12th inst. the Market and Fairs Committee made arrangements for the completion of the purchase of land in Bradford-street, Birmingham, for the construction of a new central dead meat market and public slaughter-house. It will be some time before the matter is sufficiently advanced to allow of plans for the market being drawn out. In the meantime, however, the Committee instructed the Borough Surveyor, Mr. W. S. Till, to prepare plans for the construction of the new pig market in Montague-street, the work to be proceeded with as soon as possible.

"NEW BOARD SCHOOLS, READING."—Referring to the account of the Redlands Schools, Reading, in our last issue [p. 36, *ante*], we are asked to mention that the pitch-pine block floors there mentioned were laid throughout by the Westminster Patent Flooring Company, with their patent disc keys.

SANITARY AND ENGINEERING NEWS.

THE SANITARY INSTITUTE.—Donations to the amount of 600*l.* have been made to this Institute during the past year by the hon. officers and members of the Council, and a considerable portion of this amount has been devoted to rearranging and improving its Museum of Sanitary Appliances, and to the preparation and printing of a catalogue. The Museum being open free to the public, want of funds has hitherto prevented the Council from undertaking this work, though they long felt it to be much needed, in order to make the teaching of the Museum fully available to the public.

AN ASSERTED NEW DISCOVERY IN STEAM GENERATION.—In a paper read on the 7th inst., before the Civil and Mechanical Engineers' Society (Mr. R. Nelson Boyd, M. Inst. C.E., F.R.G.S., in the chair), Mr. Reginald Bolton drew attention to some experiments which, he thought, demonstrated the action of the formation of steam bubbles in boilers. His conclusion is that the bubbles generated alternately expand and then partly contract before leaving the heated plate, and that the hitherto unexplained loss in transmitted heat is thus accounted for. He described a simple addition to boilers which has the effect of sweeping off the bubbles sideways as soon as formed, whereby a great gain can be obtained. One remarkable feature of the alleged discovery is that the known superior efficiency of the boilers of locomotives is thereby explained, as the vibration to which they are subjected releases the bubbles as soon as first formed. The subject is one of extreme interest to the whole engineering and scientific world, as marking a possible great advance in the economy of fuel in boilers.

SEWERAGE AND SEWAGE-DISPOSAL, NEW GROOMBRIDGE, SUSSEX.—Major-General Carey, one of the Engineering Inspectors of the Local Government Board, held an inquiry at New Groombridge on the 31st ult. into the subject-matter of an application by the East Grinstead Rural Sanitary Authority for sanction to borrow 2,500*l.* for works of sewerage and sewage-disposal for New Groombridge. Mr. Urban Smith, C.E., of Westminster, the Engineer to the Authority, explained the scheme, to which there was no opposition. It is proposed to dispose of the sewage by its application to land upon the principle of broad irrigation.

CANTERBURY SEWAGE FARM.—At the last meeting of the Canterbury Town Council, the Town Clerk read the report of a committee on the estimates and details of the proposed work at the sewage-farm, and on the amount to be raised by loan for these and other works. The committee having considered the estimates prepared by the Surveyor (Mr. Frank Baker), recommend that for the present only twenty-eight acres of the land to be purchased for the extension of the sewage-farm be brought into use. The committee recommend that application be made to the Local Government Board for their sanction to borrow the sum of 12,000*l.*, payable within thirty years, for various extensions of sewers and for the proposed new irrigation works, including 6,500*l.* for the purchase of land, and 1,000*l.* for subsoil drainage of twenty-eight acres. The plans for these works are now being prepared in the office of the Borough Surveyor, and tenders will be invited after the Local Government Board inquiry.

LEIGHTON BUZZARD WATERWORKS AND SEWERAGE.—In the early part of last year the Sanitary Authority of Leighton Buzzard advertised an open competition in respect of the water supply and sewerage of the town, and several engineers submitted schemes. After considerable discussion and many meetings of the Parochial Committee, two schemes were retained respectively under the mottoes, "Gravitation" and "Forward." The majority were in favour of "Forward" scheme, but it was ultimately decided to place them both before a sanitary expert for his decision, and Mr. Isaac Shone was called in to adjudicate upon their respective merits. His report has been given in favour of the schemes submitted under motto "Forward," the author being Mr. H. Bertram Nichols, Assoc.-M.Inst.C.E., of Birmingham; and at a Parochial Committee meeting Mr. Nichols' schemes for both water-supply and sewerage were recommended for adoption by the Sanitary Authority. The town of Leighton Buzzard, having a population of 7,000, is about to be constituted a Local Board District, the Beds County Council having already agreed to the application made to them, and when the necessary formalities are gone through and the Urban Authority is duly formed, it is expected the works will be immediately proceeded with.

STOCKPORT SEWAGE WORKS. The *Manchester Examiner* of the 8th inst. states that at the monthly meeting of the Council for the county borough of Stockport a report was submitted of visits paid by a deputation to sewage works in different parts of the country with a view to obtaining information which might be useful in carrying out works about to be constructed at Stockport. Mr. Alderman Turner said the Rural Sanitary Authority of the Stockport Union found the best sewage works at Hendon, where the system of the International Water and Sewage Purification Company is carried out, and lime is not used for precipitation.

SEWAGE DISPOSAL AT WORCESTER.—On the 10th inst., the Worcester Town Clerk received the following communication from the Assistant-Secretary of the Local Government Board, as the result of the recent protracted inquiry into the scheme of sewage disposal proposed by the Corporation, to carry out which they asked for sanction to borrow 50,000*l.*:—"The Board do not consider that the scheme proposed by the Town Council is such a scheme as would satisfy the requirements of Section 108 of the Worcester Extension Act, 1885, that the sewage of the city should be disposed of 'in such a manner as to prevent any offence being committed against the Rivers Pollution Act, 1876, by the discharge of such sewage into the River Severn,' and the Board will accordingly proceed to issue an order under the Local Act of 1885, limiting the time for the carrying out by the Corporation of a satisfactory scheme for the disposal of the said sewage." This (says the *Birmingham Gazette*) will compel the Water Sewerage Committee to reconsider the whole question, which has been debated in the city and the Council for several years past.

FOREIGN AND COLONIAL.

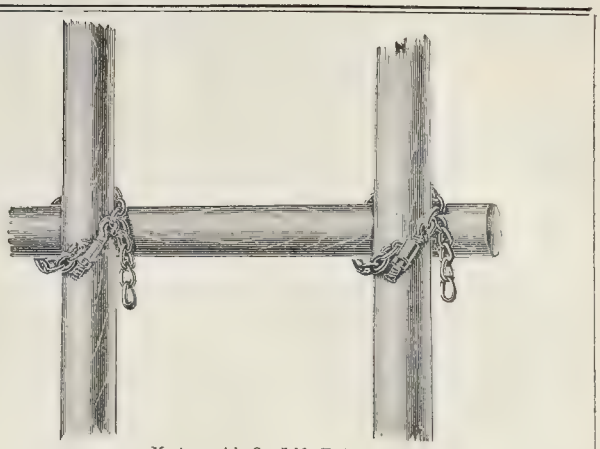
FRANCE.—The church at Ham (Somme), a monument in Romanesque style, has been injured by a fire caused by an incendiary. A good deal of damage has been done, including the destruction of several stained glass windows.——MM. Falguière, Etienne Leroux, Mathurin-Moreau, and Turcan, have been elected on the jury to decide the competition for a monument to General Lariboisière.——There is to be installed in the roadstead at Pauillac a buoy with a telephonic communication by means of which passengers, before embarking, can be put into communication with Pauillac and Bordeaux.——M. Eugène d'Argence, pupil of MM. Giraud and Basson, has been appointed painter to the Ministry of Marine.——The sculptor Aimé Millet, author of the "Vercingetorix" and the "Apollo" of the Théâtre de l'Opéra, is reported to be dangerously ill.*——M. Edouard Détaille has been elected President of the Committee of the Salon du Champs-Elysées.——There is talk of a competition to be opened in Paris shortly for a statue to Beaumarchais: the programme is in preparation by the Service des Beaux-Arts and the Paris Municipality.——A certain number of ladies in French society are occupied in working an immense altar-cloth intended for the Church of the Sacré Cœur at Montmartre. The design represents Paris and Montmartre in the centre of the composition; the arms of Paris are sustained by two chimæras in the lower portion of the work, and flanked by two blazons recalling that Henri IV. and Jeanne d'Arc have both encamped on Montmartre. Above the

* His death is announced since the above was written.

Abbey of Montmartre is represented by its two successive escutcheons. The whole is surmounted by the armorial bearings of the two archbishops who took the initiative in founding the Church of the Sacré Cœur.——M. Gustave Crank, the sculptor, has been commissioned to execute for the new Mairie of the Eighteenth Arrondissement two groups in stone to go over the porch, representing "La Justice soutenant le droit" and "L'Assistance Publique."—— The death of two sculptors is announced, the well-known Eugène Delaplanche, and M. Charles Gauthier. The latter was author of the fine restoration of the Pavillon des Drapiers at the Musée Carnavalet.——The new Bourse du Travail at Lyons, metamorphosed out of the old Théâtre des Variétés, has just been opened.——Millet's Angelus, repurchased in America for M. Chauchard, has safely arrived in France again.——The jury of the competition opened at Dax for the construction of a hot-bath establishment, has just given its verdict. The first premium has been awarded to M. Paul Esquié of Paris; the second to M. Ricard of Dax and M. Tisnes of Biarritz; the third to M. Lacombe of Bordeaux. Three other designs have been honourably mentioned.——In the competition recently opened at Mélun for a building for the town archives, the jury have given the first premium to M. Léon Majoux, of Paris; the second to M. Prosper Bulot of Mélun; the third to M. Léon Daubourg of Paris.——One of the oldest official architects of Paris, M. Huillard, the director of the section concerned with the keeping of buildings in repair, has been allowed at his own request to exercise his right of retiring. He is replaced at the Préfecture of the Seine by M. Suffit.

SWEDEN.—The designs of Herr Anderberg for the new opera-house in Stockholm, accepted in the main, are now under the final consideration of the authorities.——The new building for the Swedish State archives has been completed. The materials used are red and brown bricks, sandstone, and granite, the style being Romanesque. All the exterior doors are of massive oak, with iron ornamentation. In the vestibule are two tablets bearing Latin inscriptions, stating that the State archives were formed in the reign of Gustavus II., when the famous Axel Oxenstierna was Chancellor, and that the new building was erected in the reign of Oscar II., together with the escutcheons of the old kingdoms of Svea and Güta. The chambers containing the State papers are built of cement and iron, with heavy iron doors. The building is heated by hot water, and there is no artificial light in it of any kind, for reasons of safety. The foundation-stone was laid in 1885; the cost has been 35,000*l.* The architect is Herr A. F. Nyström, a State architect. ——The Corporation of the city of Stockholm has, on the recommendation of a specially-appointed Committee, adopted some stringent alterations of its building regulations. The most important are that in future no one must undertake the building of a house unless holding a certificate of competency from recognised technical colleges or architects, and that no building must be coated with stucco or plaster of Paris till within a year of its completion. The Committee has also under consideration a law respecting the construction and inspection of scaffoldings.——The trade in building material with South America is rapidly developing. A consignment of 2,500 doors has just been forwarded to these parts via Hull. Swedish wall-paper, too, is beginning to find a market abroad, the Norrköping factory having lately sold a good deal. A third industry, that of stained and painted glass for decorative purposes, has been successfully started by Messrs. Neumann & Vogel.——In the town of Sundswall, destroyed by fire last year, some prominent new structures have been decided upon, including a city church, to cost 21,000*l.*, and a bank to cost 7,000*l.*; whilst in Helsingborg is being erected the largest industrial factory in Sweden, the frontage being 350 ft., and the depth 74 ft., with three storeys.——The movement on foot in Sweden and Finland for reducing the output of wood goods this year is finding much support. The output will in all probability be reduced by about 200,000 standards. The well-known Hammer collection of artistic works has been removed to Cologne. It is valued at 15,000*l.* The port of Malmö is to be enlarged at a cost of 20,000*l.*

NORWAY.—The designs for the new historical museum, to be built in Christiania, are now being exhibited in that city. There are seventeen in all. The awards of the jury are adversely criticised: for instance, the leading Norwegian organ, the *Morgenblad*, is of opinion that the design awarded second prize is far preferable to that adopted; whilst "An Architect," writing in the same journal, complains that the programme laid down for the competition has been almost ignored by the jury in their decisions, and that two designs allowed to compete were exact copies, on a smaller scale, one of the Kunst and Gewerbemuseum in Berlin and the other of the Natural History Museum in Hamburg.——The Norwegian Engineer and Architect Association, the representative one in the country, has decided on appointing a committee of three members to watch the Association's interests in official technical competitions.——The town of Hammerfest, in Northern Norway, totally burned down last summer, is rapidly being rebuilt. Of late the Norwegian architectural stone industry has been greatly developed through the introduction of improved machinery.



Montgomerie's Scaffold Chain.

MISCELLANEOUS.

ARCHÆOLOGY AT UNIVERSITY COLLEGE.—The term which commenced on Wednesday last, the 14th inst., will be a specially busy one in the Section of Archæology, under Professor R. Stuart Poole, LL.D., of the British Museum. Professor Poole will deliver a course of five lectures on "Greek Coins and Sculpture" on Thursday afternoons. He will be assisted by Mr. W. St. Chad Boscawen, who will deliver five lectures on "The Principles of Babylonian Archæology" on Monday afternoons, at five, and by Professor Roger Smith, F.R.I.B.A., who will deliver a free public lecture on Thursday, January 22, on "Architecture."

ROYAL METEOROLOGICAL SOCIETY.—The annual general meeting of this Society will be held, by permission of the Council of the Institution of Civil Engineers, at 25, Great George-street, Westminster, on Wednesday next, the 21st instant, when the Report of the Council will be read, and the election of officers and Council for the ensuing year will take place.—The Council have arranged to hold, at 25, Great George-street, Westminster, on March 17th to 20th next, an exhibition of rain gauges, evaporation gauges, percolation gauges, and kindred instruments, and invite the co-operation of all who may be able to help. The Exhibition Committee will also be glad to show any new meteorological instruments or apparatus invented, or first constructed, since last March; as well as photographs and drawings possessing meteorological interest.

THE ENGLISH IRON TRADE.—There is no material change in the English iron market since last week, but it may be said to have slightly improved. Pig-iron has become somewhat firmer, notwithstanding that the business doing is of limited description. In the Glasgow warrant market there has been an upward movement, but, considering the fickleness of that market, it is impossible to say how long it will last. The tone of the North of England pig-iron trade is better, makers holding more firmly to their quotations. In Lancashire orders can be secured only at lower rates than those actually quoted. Only a moderate business is passing in the hematite pig-iron trade of the north-west. There is but a quiet trade in finished iron, but manufacturers are able to keep their works fairly going. The reduction of the price of marked bars has imparted more strength to the market. Tin-plates are very strong, and business keeps fairly active. Not much new work is being booked by steel-makers. Ship-builders are putting out a fair amount of work, and engineers are doing moderately well.—*Iron.*

NATIONAL ASSOCIATION FOR THE EMPLOYMENT OF RESERVE SOLDIERS.—We have received from the secretary of this Association, which has its offices at 12, Buckingham-street, Strand, a "memo. for employers of labour," of which the following is a portion:—"The men for whom the above Association acts are all in the prime of life, and having served in the army for periods varying from three to twelve years, have become habituated to habits of order, discipline, and cleanliness. They are usually fairly educated, having, after enlistment, attended the garrison schools. Many have gone through a course of military engineering, and understand lashing spars, building spar-bridges, making rafts, and the use of axe and spade. This instruction would render them very useful as handy men, or for employment in the building trade. . . . The characters of the men registered are thoroughly investigated, and every endeavour is used to ascertain the employment for which each man is best fitted."

NEW SCAFFOLD CHAIN.—The chain for fixing scaffold poles here illustrated, and which is patented as Montgomerie's scaffold chain, appears a more practical substitute for the usual rope lashings than some other contrivances which have from time to time been brought before us. It is, as the illustration shows, a short piece of chain with a hook which can be fixed in whatever link the hook can be



pulled round to, and then tightened up by turning the nut C which works on the screw shank, pushing up before it the loosely-fitting piece to which the first link of the chain is attached. A spanner can be applied to the nut for tightening up the chain. The illustration shows it as used for supporting ledgers. The end of the screw-shank is slightly expanded to prevent the nut passing over it and being lost.

DOMESTIC PLUMBING AND SANITARY WORK.—A lecture, promoted by the Worshipful Company of Plumbers, was given in the Athenæum, West Hartlepool, on 7th inst., by Mr. W. E. Bland, R.P.C., under the presidency of the Mayor (Ald. Lauder), on "Domestic Plumbing and Sanitary Work." The lecturer pointed out that the principal object of the meeting was to stir up the feeling of the public, on a subject so important to their health and comfort, in view to some action being taken to introduce legislative control in the carrying out of this important work, and in which so many of the leading medical men of the day have taken an active interest. He especially alluded to Dr. Teale, of Leeds, and Professor Garnett, of Newcastle, who had kindly lent him their diagrams and slides for use on this occasion, and which clearly illustrated the evils arisising from defective plumbing work. The remedies were explained, and it was pointed out that, although a system of registration of plumbers had been instituted, and was now being acted upon with much success, that was not sufficient to secure good work, hence the necessity of more stringent measures for the protection of public health and comfort. The lecturer advised the trade to educate themselves more perfectly, not only in plumbing, but the sanitary drainage work connected with it, so that they might obtain the confidence of the public, who at the present time were employing so-called sanitary engineers to supervise their work, and who could not possibly have the practical training necessary for the purpose. Resolutions were proposed, seconded, and carried to the effect that the meeting, learning with satisfaction the good work done in the public interest by the Worshipful Company of Plumbers, desires to give its support to the efforts being made by that Company to obtain Parliamentary powers for the compulsory registration of plumbers, upon whom, to so large an extent, depend the health of the community.—The speakers in support of the resolutions were Mr. G. Jones (Manager to Sir W. Gray & Co., shipbuilders), Mr. J. Clayton (architect), the Rev. H. E. Savage, M.A. (Chairman of the School Board), Mr. Stobbart, Dr. Morison, and Dr. Davis.

THE NEW CANON OF ST. PAUL'S.—It is announced that the Rev. G. F. Browne, B.D., Disney Professor of Archæology, has been appointed a Canon of St. Paul's Cathedral, in the room of the Rev. Canon Gregory, who succeeds to the Deanery. Mr. Browne will be well known to our readers from his archæological researches, particularly with regard to inscribed and carved stones.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*New Markets and Abattoirs	Bury Corporation	75*l.* 50*l.* and 25*l.*	Mar. 31
*New Municipal Buildings, Police Court, &c	do.	150*l.* 100*l.* and 50*l.*	do.
*Proposed Extension of Royal Infirmary, Manchester	Board of Management	Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Transepts to Methodist Church, Blackstaff-road, Belfast	.....	J. J. Phillips	Jan. 20
Springs, Bearings, Spirals, &c.	India Office	*Official*	do.
Pulling-down Buildings, Erecting Boundary Wall, Roadmaking, &c.	Wallasey Local Board	A. Salmon	do.
Work at Guildhall Buildings and Municipal Offices	Plymouth Town Council	G. D. Bellamy	do.
Watchmen's Shelters	Cardiff Corporation	W. Harpur	do.
Repairs, &c. to Abattoirs and Cattle Markets at Louth and Caistor	do.	*Official*	do.
Forming, Metalling, Paving, Kerbing, &c	do.	do.	Jan. 21
*Jobbing Sewers Work	Mile End Vestry	J. M. Knight	do.
New Offices, Town Hall, and Public Library, Rathmines and Rathgar, Ireland	Township Commrs.	Thos. Drew	do.
*Erection of Central Electric Light Station	Barnsley Town Council	J. H. Taylor	Jan. 22
10-ton Wharf Crane, Penzance	Trinity House Corp.	*Official*	do.
*Supply of Glazed Bricks	Hornsey Local Board	T. de Courcy Meade	Jan. 23
*Erection of Houses, &c. Lydd, near Kent	Admiralty	*Official*	do.
Farmhouse and Buildings, Withington, Cheshire	Trustees of Withington Estates	H. Beswick	Jan. 24
Pulling down and Re-building Gardener's Lodge	Portsmouth U.S.A.	*Official*	Jan. 25
Row of Houses, Lancaster Park Estate, High Harrogate	.....	G. H. F. Jones	do.
*Re-building Covered Watercourse and Relaying Portion of Main Sewer, &c.	Harrogate Corp.	Samuel Stead	do.
Road Metal	Wilton U.R.S.A.	John Goulden	Jan. 27
Granite Setts (10,000 tons)	Birmingham Corp.	W. S. Till	do.
Wesleyan Schools, Class-rooms, &c. Dewsbury-road, Leeds	.....	Geo. F. Danby	do.
Steelwork, &c. for 90 ft. span	India Office	*Official*	do
*Weights and Measures Office Newington	London County Council	do.	do.
*Public Conveniences at Victoria-park	do.	do.	Jan. 28
*Works between Maidenhead and Kennington Junction	G. W. R. Co.	do.	do
Three Shops and Offices, Corn Market, Halifax	.....	Jas. Farrar	do.
Twelve Through Houses, Sowerby Bridge	.....	S. Wilkinson	do.
*Works and Materials (one year)	Chelsea Vestry	T. W. E. Higgens	Jan. 29

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Enclosing Burial Ground (Masons' and Smiths' Work)	Falmouth Burial Bd.	W. H. Treddder	Jan. 30
Work at Old Mugdock Tunnel Waterworks	Glasgow Corp.	Mr Gale	Jan. 31
Sewer Inspection Chambers	Eton Local Board	*Official*	do.
*Paving Works	Farnham Local Board	R. F. Hankins	Feb.
*Alterations to Lavatories, &c.	St Mary (Newington) Vestry	*Official*	do.
*Sorting Office, Brombill, Sheffield	Com. of H.M. Wks. &c.	do.	do.
Converting Outbuildings into Dwelling-houses, Pontypridd	Merthyr and Aberdare Joint Farm Com.	Thos. Roderick	do.
Street Improvement Works	Brynmawr Local Bd.	G. A. Lundie	do.
New School and Offices, Heatherlands	Kinson (Wimborne) Sch. Bd.	Lawson & Donkin	do.
Road Works	Chertsey R.S.A.	*Official*	do.
*100 Ornamental Lamp Columns	Islington Vestry	do.	do.
*Works and Repairs to Sewers, Drains, &c.	Limehouse Bd. of Wks.	do.	do.
*Postal Sorting Office, North Kensington	Com. of H.M. Wks. &c.	do.	Feb.
*Sewers Work, High-street, Poplar	London County Council	do.	do.
*Sewers Work, The Grove, Hammersmith	do.	do.	do.
*Widening Timber Jetty at Barking Outfall Works	do.	do.	do.
Roofing and Wrought-iron Work, Chester	L. & N. W. & G. W. R. Cos.	do.	Feb. 4
*Cast-iron Water-pipes	Brampton U.R.S.A.	J. Reay	do.
New School Building, Firs Hill	Sheffield School Board	J. B. Mitchell-Withers	Feb.
*Battery and Drill Shed, Greenock	Admiralty	*Official*	Feb. 6
Sewering the Town	Kington (Herefordshire) U.S.A.	R. L. Bamford	Feb. 7
Work at Burntwood Asylum, nr. Lichfield	Committee	W. H Cheadle	do.
Wesleyan Chapel and School, Penryn, Cornwall	.....	J. W. Trounson	Feb. 9
*Drainage Works, Harrow	Hendon R.S.A.	*Official*	do.
Supply and Fixing Hydraulic Appliances and Power, Bishopsgate and Liverpool-street Stations E.C.	G. E. R. Co.	John Wilson	Feb. 13
*New Municipal Buildings	Sheffield Corporation	G. W. Mountford	Feb. 17
Lengthening Pierhead, Port Ellen, Islay	Peter Reid	.....	No date
Pulling-down Old and Erecting New Premises, 4 Stoke's Croft Bristol	.....	H. J. Jones	do.
Waterworks, Weaverham and Acton	Northwich U.R.S.A.	*Official*	do.
Four Houses and Shops, Armley, Leeds	.....	C. F. Wilkinson	do.
Two Semi-detached Houses, Farsley, Leeds	.....	W. D. Gill	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Inspector of Water Fittings	Tottenham Local Bd.	2*l.* 2*s.* weekly	Jan. 21
*Engineer Students and Students in Naval Construction	Civil Service Com.	Not stated	Mar. 16
Assistant Engineer, Jehapore	India Office	300-400 rupees month	No date

Those marked with an Asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv, *and* vi. *Public Appointments, p.* xvi. *and* xviii.

THE HARD WOOD TRADE IN 1890.—Messrs. C. Leary & Co., in their annual circular on ship-building, furniture, and other hard woods, say:—"The year 1890 should have been a satisfactory one to those engaged in the hard wood trade of London, and the present situation may be considered to be a sound one. The late financial stringency has restricted business, but we look for this to right itself in due time. There has been a shrinkage in the price of teak, but most of our other staples have maintained a fairly steady and reliable standard of value. Complaints are still common of the want of facilities at the docks, and most people would gladly welcome the adoption here of a system, such as that of Liverpool, under which the docks should be worked in the interests of the commerce of the port; the want of a special rate for goods sold 'ex quay' is one of the pressing needs of London. The general outlook for 1891 is favourable." Then, proceeding to give some statistics, they say:—"The imports of East India teak, excluding about 1,500 loads not yet taken to account, are 18 per cent. less, whilst the deliveries are 7 per cent. more, than those of 1889, the stock showing a reduction of 13 per cent. The tonnage afloat is 18,826 tons, and that chartered but yet to load 25,302 tons, as compared with 32,678 tons and 24,119 tons, respectively, at the close or 1889. The year has been marked by the largest total import to Europe yet recorded and by a large consumption, London well maintaining its position as a centre for business in this wood. Prices for timber have, however, been unsatisfactory both to importers and merchants, there having been a steady decline throughout the year, the present quotations being the lowest. The prospective supplies already arranged for are sufficient, and as the recent advance in prices at the shipping ports, and the high rate of exchange now ruling leave no profit to shippers at current values, it is to be expected that further shipments will be moderate and that prices may steadily, if slowly, recover. The plank statistics indicate an increasing consumption and values have not shown much fluctuation." As to mahogany, the circular says, "In face of the steady decline in consumption of former years, it is satisfactory to note the improvement borne out by the figures for 1890. The general prospects for mahogany are bright and encouraging." American walnut "maintains its position as a general favourite. The import of the celebrated Quebec wood has almost become a thing of the past, and we look to the United States to replace it. Such supplies as we have had of first quality, either in logs or lumber, have been readily taken up at figures which should have induced shippers to keep us better supplied. Lower grades have sold with more difficulty, and often at disappointing rates, in consequence of supplies sent without regard to the requirements of the market. The prospect for carefully-regulated shipments of good class is highly favourable. Logs are worth anything between 2s. 6d. and 4s. 9d. per cubic foot (calliper measure), according to quality, and lumber from 3s. to 7s. 6d." As to pitch-pine, it is stated that "prices have fallen away considerably, and during the summer business was very difficult, but there has since been some recovery, and in particular prime deals are scarce and wanted: quotations are 50s. to 70s. per load for timber and 9*l.* to 14*l.* per P. S. H. for deals."

NEW PARTNERSHIP.—Mr. Fred. J. Veall, architect, Cardiff, has taken into partnership Mr. John Augustus Sant, who is well known locally as hon. sec. of the South Wales Art Society. The new firm will practice as architects and surveyors under the style of "Veall & Sant."

MR. PETER ROBINSON is extending his already very large premises in Oxford-street, and is now erecting new premises at 206-212. This building is to be fitted with a passenger-lift, which is to be constructed by Messrs. R. Waygood & Co. upon their patent hydraulic balance system, similar to the one which has been working for some time in Mr. Peter Robinson's other premises.

EMPLOYERS AND EMPLOYED.—Messrs. Bingley, Son, & Follit, slate and tile merchants, of Westminster, entertained their employé's at dinner on Monday evening the 12th inst. Mr. William Follit, who presided, said that his hearers were aware that the object of their meeting was to mark the exodus from an old business home and their advent to a new one. In alluding to the cordial relations which had always existed between the employers and the employed, he stated that the result of an inquiry showed that the twenty-seven then present, for whom alone accommodation at the table could be found, had spent 478 years in the employ of the firm. The ten representative slaters and tilers had an average service of 21½ years, those of the masons' shop of 14½ years, and three carmen an average of 25⅓ years.

LEGAL.

DUTIES OF METROPOLITAN VESTRIES AS TO DRAINAGE.

WHITE V. THE VESTRY OF PADDINGTON.

This case (heard in the Queen's Bench Division, before Mr. Baron Pollock and Mr. Justice Charles on Wednesday last) arose out of an outbreak of diphtheria in 1889 in Westbourne-terrace. According to the *Times* report, there are four houses in Westbourne-terrace near the corner of Orsett-place.—Nos. 142 (the corner house), 144, 146, and 148,—and Mr. White occupied No. 144. These four houses were drained on what is called the "combined system" of drainage, the drains of No. 144 going under No. 142 into a sewer in Orsett-place. This was constructed when the houses were erected in 1851, and with the sanction of the Vestry. In July, 1889, there was an outbreak of diphtheria in Mr. White's house, No. 144, in consequence of which the family removed, under medical advice. An inquiry having been made by the Vestry into the drainage, it was deemed to be defective. A committee was appointed by the Vestry, who made a report to the effect that a new sewer should be constructed on the principle that the drainage of each house should go separately into the new sewer. The report was adopted, and the new sewer constructed at an expense of more than 480*l.*, which the Vestry paid. Mr. White then brought his family back to his house; but another outbreak of diphtheria occurred, and on investigation it was found that the drainage into the new sewer was still defective, and the family were sent away again. The Vestry made another inquiry, and considered that the drainage of each house should be separately conveyed into the new sewer, and made an order on the occupiers of each of the houses to construct such drains accordingly. Then Mr. White disputed his liability to make such connecting drain at his own expense, and contended that the Vestry should make the connecting drains required, or make the old system effective. He had accordingly applied for a *mandamus* to the Vestry to make the old system of drainage effectual.

Mr. Philbrick, Q.C. (with Mr. Glen), appeared for the applicant, contending that the work could only be done by the Vestry, and that it could not be done by individual occupiers, and relying on section 85 of the Act.

Mr. Poland, Q.C. (with Mr. Pelle), appeared for the Vestry, relying upon section 73 of the Metropolitan Local Management Act, 1855.

In the result,

The Court decided that a *mandamus* must issue to the Vestry to put their powers in operation under section 85 of the Act of 1885 to render the old system of drainage effectual.

AN IMPORTANT JUDGMENT AFFECTING ALL TRADE UNIONISTS.

AT the Plymouth Quarter Sessions on the 9th inst., the Recorder, Mr. H. M. Bompas, Q.C., gave judgment in the appeal cases of Messrs. Curran, Matthews, and Shepheard, trade union secretaries, against the magistrates of Plymouth.

The appellants (according to the *Times'* report) were convicted in November last by the magistrates of intimidation, and each fined 20*l.*, with the alternative of six weeks' imprisonment. The alleged intimidation consisted of threats by the appellants to ruin the business of Mr. Treleaven, coal merchant, if he did not cease to employ non-union men. They also called off their men from his ships, and prevented them from being unloaded for some considerable time. The hearing of the appeal occupied the Recorder two days. Mr. Thompson and Mr. Thorne were for the appellants, and Mr. Poland, Q.C., and Mr. Duke for the respondent.

In giving his decision the Recorder reviewed the case at considerable length, and said that he had come to the conclusion that the conviction must be affirmed. In his opinion the offence was a serious one, whether considered from the point of view of

the public or of the prosecutor. It was an offence somewhat difficult to prove and not unlikely to be repeated if met by an inadequate punishment. Moreover, a fine, which could be paid by the unions, would have a small deterrent effect, and, therefore, but for one consideration, considerate imprisonment, and not a fine, would have been the just punishment to award; but he believed that the defendants were not aware that they were acting illegally, and, therefore, he concurred with the view of the magistrates. He desired to say, however, that, now that the law had been clearly laid down, if any future cases came before them in which he had to pass sentence he should probably treat them in a very different way.

It was intimated, on behalf of the appellants, that the fines would be immediately paid, and there would be no further appeal.

BELLAGIO ARBITRATION.

BAYLIS *v.* BURR.

THIS arbitration, which resulted from the erection of the bungalows on this well-advertised estate, was referred to Mr. Edward Boyle, barrister, of King's Bench-walk, Temple, E.C., and Mr. Henry Lovegrove, of 26, Budge-row, Cannon-street, with Mr. William Willis, Q.C., named as umpire.

The matter was very carefully gone into during several days, and witnesses attended on both sides. The plaintiff's solicitors were Messrs. Thorowgood, Tabor, & Hardcastle, and Mr. Buckin appeared for Mr. Stephen on behalf of the defendant.

The arbitrators decided that on the whole matter there was a sum of 125*l.* due to the plaintiff, and all costs, including the costs of the award, were to be paid by the defendant.—*Communicated.*

MEETINGS.

MONDAY, JANUARY 19.

Royal Institute of British Architects.—Presentation of Prizes, and Presidential Address to Students. 8 p.m.

Surveyors' Institution.—Professor J. Wrightson on "The Basis of the Cost of Wheat-growing." 8 p.m.

University College (Archæology).—Mr. W. St. Chad Boscawen on "Babylonian Archæology and Art." I. 5 p.m. (Free.)

TUESDAY, JANUARY 20.

Institution of Civil Engineers.—Discussion on Mr. W. H. Allen's paper on "Auxiliary Engines in connexion with the modern Marine-Engine." 8 p.m.

Manchester Architectural Association.—Mr. R. Elsey Smith on "Some Typical Greek Buildings." 7.30 p.m.

Glasgow Architectural Association.—Mr. John Scott on "Decoration." 8 p.m.

WEDNESDAY, JANUARY 21.

Institution of Civil Engineers.—Students' Visit to the Broad-street Goods Station of the London and North-Western Railway, Eldon-street entrance. 7.30 p.m.

Society of Arts.—Messrs. A. G. Green, C. F. Cross, and E. J. Bevan on "Photography in Aniline Colours." 5 p.m.

Civil and Mechanical Engineers' Society.—Mr. R. Capper on "The Engineer and his Workmen." 7 p.m.

South Kensington Museum (Lecture Theatre).—Mr. Maurice Hewlett on "The Rise of the Renaissance in England." III. 3.45 p.m.

British Archæological Association.—(1) Mr. C. Lynam on "The Font of Lapley Church, Stafford." (2) Dr. Russell Forbes on "Discovery of Etruscan Temples at Falleria." 8 p.m.

THURSDAY, JANUARY 22.

Society of Arts (Indian Section).—Mr. E. J. Watherston on "Hall-Marking of Silver Plate, with Special Reference to India." 4.30 p.m.

Institution of Electrical Engineers.—Major-General C. E. Webber on "The Distribution of Electricity with especial reference to the Chelsea System." 8 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, JANUARY 23.

Architectural Association.—Messrs. T. Stirling Lee, F. W. Pomeroy, and W. S. Frith, on "Wood and Stone Carving." 7.30 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Some Applications of Photography." 9 p.m.

SATURDAY, JANUARY 24.

Royal Institution.—Mr. W. Martin Conway, M.A., F.S.A., on "Pre-Greek Schools of Art." I. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

1,346.—VENTILATION: *W. T. Sugg.*—According to this invention, a chamber of larger diameter than the ventilating shaft is fitted at the top of it. The current is governed by disc valves or flap valves. The top of the chamber is closed with a perforated plate, the holes being left with a burr, and the burrs being placed upwards. A little above this is placed a solid cone of larger diameter than the chamber. The cone prevents the currents of air striking downwards into the chamber, and the straight base causes the currents to pass directly across the top of the plate. A vacuum is thus created, and an upward current caused in the ventilating-shaft, the valves lifting for that purpose.

2,331.—DRAUGHT EXCLUDERS: *T. W. Pepin.*—Brackets and ends are provided by this inventor for the purpose of regulating the position of a draught-excluder fixed at or upon the bottom rail of a door to prevent the excluder from becoming jammed or interfering with the free action of the door.

7,345.—VENTILATORS: *W. Cox.*—By this invention, a metal box is inserted in the outside wall. This box is fitted with a division plate, which divides it into two chambers, each provided with flanges or edges which project beyond the box. One is an outlet and the other an inlet, and the inlet is finished with a curved lip to direct the current. The admission of air is controlled by a slide in the ordinary way.

11,949.—SLIDING WINDOW-SASHES: *R. Brealey.*—The sash, which is the subject of this patent, is held automatically in frame, the device being principally adaptable for railway-carriage windows. It consists of a lever controlled by a catch, which travels along a rack, and allows a toothed wheel to be adjusted in any position.

12,591.—COUPLINGS: *J. J. Ricketts and another.*—According to the specification, a connecting elbow of flexible material, suitably shaped, is made to connect pipes to water-closet basins, waste-sinks, &c.

3,120.—DOMESTIC HEATING: *R. H. Radcliffe.*—According to this specification, the hot water circulating-cylinder is enclosed in a jacket, cold air being admitted from below, and discharged warmed into the apartment.

17,047.—WATER-CLOSET BASINS: *J. Barclay.*—By this invention, a flushing rim or ring is formed with a series of holes on the under side to flush out the basin thoroughly.

NEW APPLICATIONS FOR PATENTS.

January 1.—8, J. Kaye, Stops for Doors, Gates, &c.—13, J. Sim, Fittings for Casement Windows, Doors, &c.—17, F. & E. Collinson, Glazing Roofs, &c.—19, M. Syer, Waste-preventing Valve.—34, T. Robinson, Planing and Moulding Machines.—64, T. Reed and others, Water Taps.

January 2.—68, F. Vowles, Automatic Window Fastener.—70, C. Sharp and J. Firth, Fire Grates.—82, G. Haskins, Spring for raising Closet Seats, Counter Cases, Closing Doors, &c.—104, B. Oelrichs, Bakers' Ovens.

January 3.—118, F. Pover, Ovens for the Firing of Bricks, Tiles, &c.—124, J. Bobart, Open Fireplaces.—161, W. Bradley, Door Bolts.

PROVISIONAL SPECIFICATIONS ACCEPTED.

19,302, J. Brookfield & A. Whitehead, Cramp.—19,654, A. Booth, Sawing-machine.—20,384, J. Bayly, Window Sashes.—20,409, W. McGle, Preventing Blow-downs in Chimneys.—20,475, J. Leather, Ventilating Structures.—20,506, J. Bnatier, Window Sashes.—20,627, J. Bayly, Chimney Caps and Ventilator.—20,830, H. Bayley, Electric Ceiling Roses and Wall Connectors.—20,831, W. Oakley and C. Spurrier, Electric Ceiling Roses and Wall Connectors.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

3,233, E. Marples and E. Lamburn, Combination Tool Cabinets.—3,418, J. Dean, Water Closets.—9,422, W. Lester, Glazing Bars or Astrogals for Roof Lights and Windows.—11,831, W. Lester, Glazing Bars or Astrogals for Roof Lights and Windows.—19,687, C. Morrill, Saw Sets.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	15	0	7	5	0
Teak, E.I. ....load	10	0	0	13	0	0
Sequoia, U.S. ....foot cube	0	2	8	0	3	0
Ash, Canada ....load	2	10	0	4	5	0
Birch ,, ...load	2	5	0	4	5	0
Elm ,, ...load	3	10	0	4	15	0
Fir, Dantsic, &c. ....load	2	0	0	3	15	0
Oak ,, ...load	2	10	0	4	10	0
Canada ....load	4	17	6	6	10	0
Pine, Canada red ....load	2	10	0	3	10	0
,, yellow ....load	2	0	0	5	10	0
Lath, Dantsic ....fathom	5	0	0	6	0	0
St. Petersburg ....fathom	5	0	0	7	0	0
Deals, Finland, 2nd & 1st. std. 100	7	10	0	10	0	0
,, ,, 4th and 3rd	7	0	0	7	5	0
Riga ....load	6	0	0	8	0	0
St. Petersburg, 1st yellow	9	10	0	14	10	0
,, 2nd ,, ...	7	10	0	9	0	0
,, ,, white	7	0	0	10	0	0
Swedish ....load	7	0	0	15	10	0
White Sea ....load	8	0	0	17	0	0
Canada, Pine, 1st	13	0	0	24	0	0
,, ,, 2nd	9	0	0	16	0	0
,, ,, 3rd, &c.	7	0	0	10	0	0
,, Spruce, 1st	8	10	0	10	10	0
,, ,, 3rd and 2nd	6	10	0	8	0	0
New Brunswick, &c.	5	10	0	7	10	0
Battens, all kinds	4	10	0	15	10	0
Flooring Boards, sq., 1 in., prepared, First	0	10	0	0	14	0
Second	0	8	0	0	10	6
Other qualities	0	5	6	0	7	9
Cedar, Cuba ....foot	0	0	4	0	0	5
Honduras, &c.	0	0	3½	0	0	4½
Mahogany, Cuba	0	0	4½	0	0	6½
St. Domingo, cargo average	0	0	4½	0	0	6½
Mexican ,, ...	0	0	4½	0	0	5½
Tobasco ,, ...	0	0	5½	0	0	6½
Honduras ,, ...	0	0	5½	0	0	6½
Box, Turkey ....ton	4	0	0	18	0	0
Rose, Rio	12	0	0	19	0	0
Bahia	10	0	0	18	0	0
Satin, St. Domingo ....foot	0	0	9	0	1	3
Porto Rico	0	0	10	0	1	6
Walnut, Italian	0	0	4	0	0	7

METALS.						
IRON—Bar, Welsh, in London tn	6	5	0	6	15	0
,, ,, at works in Wales	5	15	0	6	5	0
,, Staffordshire, in London..	6	5	0	7	0	0
COPPER—British, cake and ingot	56	10	0	57	0	0
Best selected	58	10	0	59	10	0
Sheets, strong	66	0	0	0	0	0
Chili, bars	51	15	0	0	0	0
YELLOW METAL ....lb.	0	0	6	0	0	6½
LEAD—Pig, Spanish ....ton	12	15	0	0	0	0
English, com. brands	13	0	0	0	0	0
Sheet, English, 3 lbs. per square foot and upwards....	15	0	0	15	5	0
Pipe	16	10	0	0	0	0
ZINC—English sheet ....ton	25	5	0	26	10	0
TIN—Straits	91	15	0	0	0	0
Australian	92	5	0	0	0	0
English Ingots	94	10	0	0	0	0

OILS.	£.	s.	d.	£.	s.	d.
Linseed ....ton	21	10	0	21	17	6
Cocoanut, Cochin	33	10	0	34	0	0
,, Ceylon	29	0	0	0	0	0
Palm, Lagos	25	10	0	0	0	0
Rapeseed, English pale	29	5	0	29	10	0
,, brown	28	0	0	0	0	0
Cottonseed, refined	18	0	0	0	0	0
Tallow and Oleine	21	0	0	40	0	0
Lubricating, U.S.	6	0	0	7	0	0
,, refined	7	10	0	12	0	0
TAR—Stockholm ....barrel	1	1	6	1	2	0
Archangel	0	14	6	0	0	0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BIRSAY (Orkney).—For drill-instructor's cottage, at Yesnaby Artillery Drill-hall, Birsay, Orkney. Mr. T. S. Peace, architect, Kirkwall :—

Wm. Futh	£322 0	Sam Futh	£257 0
S. Baikie, jun.	320 0	J. Consul, Kirkwall*	288 10

* Accepted.

BRIDGEND (Glamorganshire).—For rebuilding the "Bridge Inn Hotel, Bridgend :—

J. Lewis Jones, South Cardiff (accepted)	£2,360 0 0

CHALFONT (Bucks).—For altering and restoring mansion at Chalfont Bucks :—

N. L. Jerome, Finsbury-park (accepted)	£2,328

CLECKHEATON.—For building an infectious diseases hospital with mortuary buildings, &c., walls, and sewer at Oakenshaw-lane. Mr. W. J. Isley, architect, 5, Charles-street, Bradford, and Mr. G. C. L. [illegible], Cleckheaton :—

Messrs. Wilkinson & Crowther, Cleckheaton	£2,399 10 0
Boundary walls, roads, and drainage, H. Birkby & Son, Wyke	1,295 0 0
Joiner's work, J. Mitchell & Son, Bradford	1,085 0 0
Plumber's work, S. Phelps and W. A. Bywater, Low Moor	474 0 0
Plasterer's work, E. & B. Briggs, Low Moor	236 7 1
Carters' work, D. Lister, Ilkley	164 11 0
Slater's work, A. Hall & Son, Bradford	234 0 0
Wrought-iron work, W. Jenkins and Cleckheaton	159 3 6

COLCHESTER.—For the erection of a pair of houses in Beaconsfield-avenue for Mr. G. Hardman. Mr. Charles E. Butcher, architect, Victoria-chambers, Colchester :—

E. Dupont	£[illegible]	W. A. Chambers	£[illegible]
Appleton, Smith, & Co.	825	[illegible] accepted	718
T. J. Ward	[illegible]	E. Dupont	678
C. E. Driver	725	[illegible] accepted)	720

[All of Colchester.]

COLCHESTER.—For the erection of a pair of cottages in Barrack-road for Mr. S. M. Sandle. Mr. Charles E. Butcher, architect, Victoria-chambers, Colchester :—

Appleton, Smith, & Co.	£[illegible]	A. Dupont	£[illegible]
E. Dupont	[illegible]	W. A. Chambers	[illegible]
T. J. Ward	[illegible]	E. Dupont	478
C. E. Driver	[illegible]	[illegible] accepted)	[illegible]

[All of Colchester.]

EASTLEIGH (Hants).—For the erection of a Conservative Club house, in Desborough road, Eastleigh, Hants, for the Trustees of the Eastleigh Conservative Club. Mr. S. C. Greenwood, architect, 14, Portland-street, Southampton :—

John Crook, Southampton (accepted)	£1,283 0 0

HYTHE (Hants).—For the pulling down and re-erecting house at Lakedowne, Hythe, near Southampton, for Mr. C. H. Candy Mr. Stansfield C. Greenwood, architect, 14, Portland street, Southampton :—

W. Franklin, Southampton (accepted)	£995 0 0

LEEDS.—Accepted tender for alterations and additions to the Queen Hotel, Hunslet, for Mr. Wm. Bamforth. Messrs. Smale & Mitchell, architects, 98 Albion-street, Leeds :—

Wm. Brown & Son, *Mason and Bricklayer.*	
John Braithwaite, *Joiner.*	
Robert Braithwaite, *Roof-mr.*	
John Fox, *Plumber.*	
James Scales, *Plasterer.*	
John Bowness, *Painter and Decorator.*	
[All of Leeds.]	
Geo. W. Lister & Son, Hanley, *Tiling.*	

LEWES.—For the erection of the vaults and cellars at the Municipal Buildings and Corn Exchange, La Brunge, for the Town Council. Mr. A. H. R. Borough Surveyor, Town Hall, Lewes :—

Berry & Bassy	£[illegible]	W. P. Freeman	£[illegible]
W. A. Peel	[illegible]	E. Peters	[illegible]
E. Verrall	[illegible]	John Floyd, Lewes*	[illegible]

* Accepted.

LONDON.—For the erection and completion of Wesley an Methodist Chapel, City-road, E.C. Mr. E. Hood, architect :—

Ashby & Horner	£[illegible]	T. E. Nightingale	£[illegible]
Dove Bros.	[illegible]	H. Lowry Bros.	[illegible]
Lawrence & Sons	[illegible]	J. Mowlem & Co.	10,290
Colls & Son's	12,144	McFarlane	10,295
Chatters & Sons	[illegible]		

LONDON.—For alterations and foundations of new factory, Gubbin-street, E., for Messrs. J. & R. Morley, 18, Wood-street, E.C. Mr. H. J. Treadwell, architect :—

Peto Bros.	£[illegible]	Perkins, Son, & Bloxham	£[illegible]
Dove Bros.	[illegible]	Rider & Son	[illegible]
Colls & Sons	[illegible]	E. Nightingale	[illegible]
Ashby Bros.	[illegible]		

LONDON.—For the painting of the railings and other things at Myatt's Fields, Camberwell, for the London County Council. Mr. Thomas Blashill, Architect :—

H. Munn	£[illegible]	Addis Patent Fire Proofing Co.	£[illegible]
G. W. Stewart	[illegible]	G. Barker	[illegible]
W. Smith & Co.	[illegible]	S. M. Myers	[illegible]
C. Rhodes	[illegible]	[illegible]	[illegible]
Greenaway & Son	[illegible]	[illegible]	[illegible]
[illegible] & Co.	[illegible]	W. Akers & Co.	[illegible]
[illegible] operative Builders	[illegible]	[illegible]	[illegible]
Arthur & Co.	[illegible]	W. A. Mill	[illegible]
W. K. Bowden	[illegible]	W. Lumsden	[illegible]
Cowan & Sons	[illegible]		
G. W. Reid	[illegible]		

* Accepted.

LONDON.—For repairing and laying a pipe sewer with manholes, gullies, &c., in Peter's-row, Lime-house, Poplar, for the Fulham Vestry. Mr. J. P. Norris, [illegible] Surveyor, Town Hall, Walham Green :—

J. H. [illegible]	£[illegible]	[illegible]	£[illegible]
[illegible] & Wimpey	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
G. Bell	[illegible]	[illegible]	[illegible]

LONDON.—For [illegible] and [illegible] at the National Public Schools, [illegible] Greenhithe :—

[illegible]	[illegible]	[illegible] & Robson	£[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

LONDON. For making-up and laying Bulow road, for the Vestry of Fulham. Mr. W. Sykes, New Streets Surveyor :—

Greenham	..	..	£1,151
Tomes & Whipley	..	..	1,104
Killingback	..	..	1,100
Nowell & Robson	..	..	£1,145
Bell	..	..	1,097

LONDON. For alterations, &c., to "The Raven Inn," for Hodgsons Kingston Brewery Co., Limited. Mr. W. M. Yetts, architect, 44, Finsbury-pavement, E.C.

G. Sharpe	..	..	£1,345
W. Downs	..	..	1,241
G. E. Todd	..	..	1,285
Faulkner	..	..	£1,246
B. E. Nightingale	..	..	1,233
W. Larter	..	..	1,204

LONDON.—For the erection of the Church, 1st, Faith's Mesars. J. E. K. & J. D. Cutts, architects :

J. Wood	..	..	£2,913
Woods of Canterbury	..	..	2,790
Holloway Bros.	..	..	2,753
Tyrman	..	..	£2,714
R. E. Nightingale	..	..	2,710
A. Perter	..	..	2,664

LONGTON (Staffs). For erecting new stables and coach-house, for Mr. J. Wenlock. Mr. W. Giubee Scott, architect, 22, Bedford-row, London, W.C.—

Thos. Minks	..	..	£489
P. H. Bennion, Fenton*	..	..	£439

* Accepted.

MANCHESTER. For completing streets, for the Stretford Local Board. Mr. Royle, Surveyor, Local Board Offices, Old Trafford, Manchester.

	Hatfield-street	Empress-street
Withington & Prestwich, Manchester	£485 11 0	£497 1 6
Matthew Naylor, Manchester	*474 4 6	*491 6 0
George Clarke, Manchester	541 0 8	597 10 0

* Accepted.

MARDY (South Wales). For the erection of thirty houses at Mardy. Mr. W. Thomas, architect, Aberdare :—

John Hopkins, Resta, Caerphilly	..	..	£5,000 0 0

MILFORD-ON-SEA (Hants). For the erection of new house for Mr. A. H. Hare, M.D., Hants. Mr. W. Charles Evans, architect, 25, Lowther Arcade, London :—

Manfield	..	..	£—
Rushby	..	..	£867
Rocks	..	..	781

NORTHAMPTON. For erecting new premises, Abington-street, for Mr. W. Bowen. Mr. Samuel J. Newman, architect, 52, Abington-street, Northampton :—

J. B. Clark	..	..	£1,292 0
Clayton Bros.	..	..	1,249 10
W. Lord & Son	..	..	1,224 0
J. Fisher	..	..	—
W. Hardingham	..	..	£1,151 5
J. T. Wingrave, North-ampton (accepted)	..	..	1,133 16
J. Robson	..	..	1,101 0

SHIPLEY (Yorks). For erecting a new citadel, &c., for the Salvation Army. Mr. W. Gilbee Scott, architect, 25, Bedford-row, London, W.C.

Wright & Robinson	..	..	£3,700 0
Martin	..	..	3,250 0
F. J. Cockrad	..	..	3,200 0
Preston & Ellis and J. Lockett	..	..	3,150 0
			2,893 12
Wm. Ives & Co.	..	..	£2,810 0
Thos. Shaw & Sons	..	..	2,717 0
Jas. Dixon	..	..	2,449 0
Rhodes Bros.	..	..	2,373 0

SOUTHAMPTON. For building new offices and workshops at Northam, for Messrs. Summers & Payne. Mr. William Burrough Hill, F.S.I., architect & surveyor, Southampton :—

H. Stevens & Co.	..	..	£1,[illegible]9
J. W. Ive & Co.	..	..	1,685
J. Ball, Sons, & Co.	..	..	1,[illegible]2
H. & J. Saunders	..	..	£1,488
J. Crook & Sons*	..	..	1,313

* Accepted.

SOUTHAMPTON. For building down-town mission, recreating the "King's Arms," Hack-street, Southampton, for Mr. R. Mees, M.P. Mr. Stanton C. Greeny, jun., architect, 14, Portland-street, Southampton :—

R. Curtis, Southampton (accepted)	..	..	£839 10 0

STANNINGLEY.—Accepted for the erection of four houses and shops and eight cottages at Stanningley, Leeds. Messrs. Jowett Kendall and J. Harper Baker, architects, Calverley-chambers, Park-square, Leeds :—

Four Houses and Shops.

S. Waterhouse, mason and bricklayer, Stanningley	..	..	
J. B. Mann, joiner and carpenter, Stanningley	..	..	
J. Lister & Sons, plasterers, Stanningley	..	..	£1,490 0 0
H. Pennington, plumber, Stanningley	..	..	
F. Thompson, slater, Stanningley	..	..	

Eight Cottages.

J. Ambler, mason and bricklayer, Pudsey	..	..	
E. Verity, carpenter and joiner, Stanningley	..	..	
A. Taylor, painter, Lowedhill	..	..	£1,091 0 0
E. Rhodes, plumber, Pudsey	..	..	
F. Thompson, slater, Stanningley	..	..	

SUNDERLAND. For the erection of a new citadel to hold about 1,800 persons for the Salvation Army. Mr. W. Gilbee Scott, architect, 25, Bedford-row, London, W.C. :—

Middlemiss Bros.	..	..	£4,650 10 0
R. Hudson, jun.	..	..	4,292 0 0
W. Scott & Son	..	..	4,186 10 0
French & Ellwood	..	..	3,890 0 0
G. H. Hodgson	..	..	3,845 15 0
J. W. White	..	..	£3,800 0 0
D. & J. Rankin	..	..	3,687 0 0
J. P. Shafto	..	..	3,587 10 0
F. J. Cockrad, Leytonstone*	..	..	3,533 0 0

* Accepted.

SWANLEY (Kent). For the erection of Home, for the trustees of the Hospital Convalescent Home. Mr. E. B. Dawson, M.A., architect :—

Rider & Sons	..	..	£33,901
Pitt Bros.	..	..	33,441
Dove Bros.	..	..	32,[illegible]
Higgs & Hill	..	..	32,540
Bywaters	..	..	32,[illegible]0
R. E. Nightingale	..	..	32,338
Goddard	..	..	30,880
Patman & Fotheringham	..	..	£30,501
The Best & Bingham	..	..	29,976
Charteris	..	..	29,775
Adcock	..	..	29,503
Shilitoe	..	..	29,179
Paramore	..	..	28,000

WAKEFIELD.—For the construction of a pipe sewer, with sewage settling tanks, at Westerton, West Ardsley, for the Urban Rural Sanitary Authority. Mr. Frank Mawer, Assoc. M. Inst. C.E., Engineer, Tetley House, Kirkgate, Wakefield. Quantities by the Engineer :—

David Ellis	..	..	£630 7 6
William Dorman	..	..	462 2 0
Martin Burke	..	..	400 5 8
Robins & Thompson	..	..	388 0 0
George Wilson, Wakefield*	..	..	£345 5 6
T. & J. Alliff	..	..	280 18 5
T. Barstowe	..	..	272 2 0

* Accepted. † Informal.

WOODFORD.—For alterations at the Castle Hotel, Woodford, Essex, for Mr. Joiner. Mr. Edward Brown, architect, 1, Princes-street, Spitalfields :—

H. Wells	..	..	£[illegible]
A. D. Smith	..	..	420
C. R. Belcher	..	..	[illegible]
A. H. Arter	..	..	£[illegible]
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L. E. P. (suggestion shall have attention).—R. F. J. B. C. (acknowledgment by letter).—H. G.—H. W. D. (thanks).—A. T. (the proposed letter seems a good one).—M. A. (many thanks for information).—Jerry-ed Nottingham (better be with the Timber that is already affected but take out at once. Creosoting is not effective to take out the insect objectionable in regard to the sound Deal pieces and Battens which are the cost item and if watch is not kept for the risks as to the creosoting of suspected pieces which could be removed to advantage from inspection of the spot.—W. L. Nicholl (have sent on).

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The Economy of Inland Transport.

IT has been said that he who can cause two blades of grass to grow where but one grew before, is a benefactor to mankind. It may be said with equal truth that whosoever can enable the transport of two tons of merchandise to be undertaken at a rate of freight hitherto charged for the conveyance of one ton is also a benefactor to his species. In order to effect this most desirable result we have to enquire: How can we secure, in the general interest of the commonweal, the indisputable resulting advantage from a condition in which the trader enjoys the free unrestricted competition of water transport and land transport, with the election of the the choice of either according to the nature of the services required? Much light as to the course to pursue is afforded by the lines indicated in the resolutions adopted at the Fourth International Congress on Inland Navigation, held in Manchester on July 28, 1890, and the subsequent week. At this important conference of eminent transport authorities, representative of all the leading commercial nations, the results of prolonged deliberations were summarised in the form of resolutions, the terms of which are as follows:—

1. Owing to the low cost of construction and maintenance of waterways, they form a valuable means for transporting large masses at cheap rates, and should be the object of earnest attention on the part of those concerned, and of the State.

2. In order to secure this, a cheap, thorough-going transport system, with uniform dimensions, is essential.

3. The existence and development together of railways and of waterways are desirable: (A) Because these two means of transport are the complement of each other, and ought each to contribute according to its special merits to the public good; and (B) because, from a broad point of view, the industrial and commercial development which will result from the perfection of means of communication must in the end profit both the railways and the waterways.

4. The great value of waterways to the country at large, and the fact that they are the feeders of, and supplementary to, railways, justifies the State and public bodies in assisting the construction and maintenance of waterways of uniform dimensions, so as to encourage through traffic at low rates.

Should the programme formulated in the foregoing resolutions be followed, we shall arrive at a much earlier solution of the inland transport problem than can reasonably be hoped for as the result of the perennial enquiries made by Royal Commissions and Parliamentary Committees appointed to investigate as to the rates of freight which it would be equitable for merchants and manufacturers to pay, and the covered charge for the transport of goods. It is no longer a question of what the traders must pay, it has become a question of what they can pay. And, as regards the water and land traffic carriers' it is not so much a question of what the companies may charge, as a question of what they can charge with any reasonable anticipation of yielding a dividend. The determination of such issues could not be accomplished by any legislative enactment. In France, Germany, Belgium, and Holland, countries where there is an effective competition between water transport and land transport, the railway rates average about 40 per cent. less than the corresponding charges levied on the railways of the United Kingdom. The late Mr. John Slagg, M.P., one of the representatives of the Government of the United Kingdom on the Directorate of the Suez Canal, in an address to the Manchester Chamber of Commerce in April, 1882, directed attention to the urgency of the situation, in view of the increasing keenness of foreign competition, in the following terms: "When we consider the enormous competition to which we are subjected by foreign nations, and the almost costless canal traffic extending in France to every market and centre of industry, we should see the necessity of bestirring ourselves to make the best possible use of similar advantages in this country." The identification of the French Government with the development of inland navigation in that country forms a marked contrast with the apathetic attitude which has hitherto characterised the Government of the United Kingdom. In France, up to 1868, the expenditure on 6,657 miles of inland navigation amounted to 47,295,867*l.*, of which 38,790,766*l.* was expended by the State, 4,580,440*l.* partly by State and private companies, and 4,924,457*l.* by exclusively private companies. Of this sum, 32,738,715*l.* was expended on canals, and 14,557,152*l.* on river navigation. The average outlay per mile on canal navigation was 10,500*l.*, and on river navigation 4,000*l.* The average yearly cost of maintenance of canals between 1839 and 1868 was 92*l.* 14*s.* per mile, and that of rivers, 34*l.* 7*s.* per mile. On the inland waterways of France the total cost of transport,—including toll and freight—amounts in all to about four-fifths of one penny per ton per mile. The tolls on the State inland navigation in France were abolished by a statute of February 19, 1880, no charge being made for the right of passage, excepting on a few canals remaining in the hands of some companies.

In 1872 a commission appointed to inquire into the economy of inland navigation in France observed *inter alia* in their report: "Water carriage cannot boast of speed, and therefore in this respect it will be almost always outrivalled by rail carriage, but it still possesses advantages in cheapness and in greater power for the transport of bulky articles. Compelled to carry passengers and goods at different speeds, railways have not an unlimited power of transport. On the other hand, without being exactly unlimited, the power of water-carriage is capable of much greater extension. Owing to the facility with which its less costly plant can be increased, and to the facility with which boats can be stopped everywhere and anywhere on their course, water-carriage possesses two special advantages, by which, even at the present day, it is enabled to play an important part in contributing effectively to agriculture and other industries, as well as, in certain cases, competing successfully with railways." In conclusion, the Commission observe, "France has been long enough led to think that its establishments and institutions are unrivalled, and that it has nothing to expect or learn from other quarters. A cruel experience has put to flight these patriotic exaggerations, and has taught us that it is not desirable for a nation, any more than for individuals, to live apart in contemplation of or in admiration of its own works." This observation, though intended for the edification of the National Assembly of France, conveys food for reflection

among those engaged in the administration of the United Kingdom. The figures given in the Report on Internal Navigation in France by the Commission of 1872, as regards traffic on canals and canalised rivers, amounted to 835,113,017 ton-miles, and upon rivers to 383,359,100 ton-miles. During the sixty years of the railway era, we have so rapidly grown in wealth that we have been somewhat negligent of some things, and, in some respects, too prodigal. The English railway system is undoubtedly the most remarkable development in transport to be found in the entire record of the history of mankind. Dazzled, however, with the magnificent railway system we possess, we have for a long time neglected an ancient handmaid of commerce. We have, in effect, neglected our inland waterways for over half a century. While suffering a long sleep, like Rip Van Winkle, our continental neighbours have been busily occupied in providing the most economical methods of internal conveyance for heavy traffic and the raw materials required for manufacturing purposes. The Government of France, as the result of the inquiry in 1872 and a further investigation in 1874, have sanctioned an outlay of 33,300,000*l.* to be gradually expended in extending and perfecting the existing system of inland navigation in that country. The extensions comprise additions amounting to 1,817 miles. In view of the enormous expansion in the magnitude of the operations of our merchants and manufacturers, and the ever-growing demand for increased means of intercommunication, is it not paradoxical to find a diminution in the length of inland navigation in this country of over 300 miles? Why has Britannia, the greatest merchant-carrier on the great ocean highways of the world, let her inland waterways go by default? The most striking illustration of the apathetic attitude maintained in this country with regard to our inland waterways is the circumstance that, although most of the canal companies existed long before the railway companies were thought of, no compulsory returns as to capital, traffic, works, revenue, expenditure, profits, &c., could be enforced from the waterway companies until the operation of the Railway and Canal Act, 1888, which came into force on January 1, 1889. Under section 39, sub-section 2 of this Act the canal companies are compelled to make annual returns by a stipulated time, similar in character to those made by the railway companies annually since 1854. The returns made to the Board of Trade in respect of the canals and navigations for the year 1888, in compliance with the Act, were published in June, 1890. While imperfect in many particulars, the returns for 1888 certainly afford the most valuable insight into the economy of the inland navigation of the United Kingdom yet afforded. The subjoined statement, showing the distribution of mileage of the inland navigation systems of the United Kingdom, as severally under railway control and under independent administration, will be found instructive. The particulars are compiled from the Board of Trade returns, 1888:—

Inland Navigation, United Kingdom: Effective Mileage, 1888.

	m.	c.	m.	c.
ENGLAND AND WALES:—				
Great Northern	80	14	—	
Great Northern and Great Eastern	10	60	—	
Great Western	213	7	—	
Lancashire and Yorkshire	15	60	—	
London and North-Western	461	35½	—	
Manchester, Sheffield, and Lincolnshire	164	52	—	
Midland	47	10¾	—	
North-Eastern	69	20	—	
Furness	1	41	—	
North Staffordshire ...	119	3	—	
West London Extension	0	32	—	
Mileage under railway control	1,183	15¼	—	
Mileage under independent administration ...	1,866	77	—	
			3,050	12¼
SCOTLAND—				
Caledonian	52	52	—	
North British	31	53	—	
Mileage under railway control	84	25	—	
Mileage under independent administration ...	69	40	—	
			153	65
IRELAND—				
Mileage under control Midland Great Western	96	0	—	
Mileage under independent administration ...	513	38	—	
			609	38
Total mileage in the United Kingdom			3,813	35¼
Total mileage under railway control	1,363	60¼	—	
Total mileage under independent administration...	2,449	55	—	
			3,813	35¼

From the foregoing particulars it will be seen that out of a total of 3,813 miles of effective inland navigation within the United Kingdom, 1,364 miles, or 35·78 per cent., are under railway control, and that 2,449 miles, or 64·22 per cent., remain under independent administration. According to the returns made to the Board of Trade relating to the canals and navigations within the United Kingdom, the total volume of traffic which utilised this means of transport in the year 1888 amounted to 36,301,120 tons. During that year the volume of traffic using the railway system of the United Kingdom, according to the returns furnished to the Board of Trade, amounted to 281,748,383 tons, distributed over 19,812 miles of effective railways. Out of the 281·75 million tons conveyed on our railways, only 80·17 million tons consisted of ordinary merchandise, the remaining 201·58 million tons being described as minerals. The gross earnings averaged per ton of merchandise works out at 5s. $7\frac{36}{100}$d., those for minerals averaging 1s. $7\frac{88}{100}$d. The percentage of load consisting of merchandise during 1888 was 28·45, and that of minerals 71·55. The contribution to the whole of the gross earnings from the goods traffic on the railways from merchandise in 1888 was 58·59 per cent., the contribution from minerals only amounting to 41·41 per cent. The returns made to the Board of Trade for the year 1888 relating to the traffic conveyed upon inland navigations do not, as in the case of the returns from railways, distinguish as between ordinary merchandise and minerals. However, of the aggregate tonnage conveyed by inland transport on railways and waterways of the United Kingdom during 1888, the figures being 318,049,503 tons, the waterways only secured 11·41 per cent. of the whole volume of traffic as recorded by the Board of Trade. Although this is a relatively small figure, it is interesting to note that of the 36,301,120 tons conveyed upon the inland waterways during 1888, those under independent administration, according to the Board of Trade Returns, were the vehicles for the conveyance of 28,274,175 tons, while the waterways under railway control were only used as the means of transport for 8,026,307 tons. It is also interesting to note that, according to the same official authority, the proportion of net profit per mile of navigation during 1888 was slightly more than double on the independent navigations, over that earned upon those under railway control. And, further, that the proportion of expenditure to receipts was appreciably less during that year on the independent navigations than that upon the railway-controlled navigations.

As already observed, the volume of mineral traffic upon the railways of the United Kingdom is of much greater magnitude than the merchandise traffic, and the earning power of mineral traffic is considerably less than that of the merchandise traffic. The figures previously given show that the mineral load is 43·10 per cent. greater than that of merchandise, and that the earning power is 17·18 per cent. less. This appears to be a very unsatisfactory feature of railway economy, and there is a strong presumption that, on the whole, it is worked at a loss, and that this loss is compensated by the superior earnings of passenger and merchandise traffic. In France the Chemin de Fer du Nord is the only railway in the country which encourages mineral traffic, this heavy and unprofitable traffic being there principally conveyed by the waterways. The late Mr. J. Grierson, the well-known and capable General Manager of the Great Western Railway, one of the principal mineral lines, furnished particulars to the Select Committee of the House of Commons on Railway Rates and Charges, 1881–1882, showing that the cost of mineral terminals upon that extensive system was within a fraction of 2s. 3d. per ton. In 1880 the gross earning upon each mineral ton carried upon the railways of the United Kingdom was 1s. 9½d. In 1888 the gross earning power of each mineral ton was only 1s. 7⅞d. Obviously, such rates being less than the cost of terminals, could not possibly contribute to net revenue. In addition to the unprofitable character of the mineral traffic, *per se*, another important feature must be taken into account, namely, the cost of the greater part of the shunting operations, which mostly have their origin in the necessity of relieving the lines of mineral trains to make way for passenger traffic. On the London and North-Western system one locomotive out of twelve is occupied in shunting operations, and on the Manchester, Sheffield, and Lincolnshire system two miles out of every five of the goods and mineral locomotive mileage run is referable to the same cause. Whether it be true or not that the railway companies make up losses on the working of the mineral traffic by the necessity of exacting higher rates than would otherwise be the case upon food commodities, manufactured goods, and upon the raw materials required for our leading industries, it is certain that a large proportion of goods now conveyed by rail could be much more cheaply carried by canal. Such a diversion of certain classes of traffic would not only prove to be a considerable factor as a matter of national economy, but it would also, without doubt, be of the greatest advantage to the shareholders of the railway companies themselves. According to the official report of the statutory half-yearly meeting of the Manchester, Sheffield, and Lincolnshire Railway Company, held on January 24, 1883, its well-known Chairman, Sir E. W. Watkin, Bart., M.P., on that occasion observed *inter alia*: "I am one of those who have never had any jealousy whatever on the question of competition between water and rail. I believe there is a trade for the water and for the rail. In addition to that, I think there is a traffic sometimes carried by railway which might be more profitably carried by water." An observation in such terms, coming from so redoubtable an authority, is pregnant with meaning. Sir Arthur Cotton, General, R.E., Madras, another eminent authority on matters affecting inland transit, in a "Memorandum on Canals" (*vide* Appendix No. 21. Report, Select Committee on Canals, 1883), having been conversant all his life with the subject, observes:—"The important subject of internal water-carriage has for fifty years been so totally lost sight of in consequence of the new start given to land-carriage by the discovery of railways, that it is now entirely behind all other material matters in its development. This has been especially the case in England. But now, at last, after fifty years' experience, it is beginning to be realised in other countries, especially in France, that railways cannot carry either so cheaply or in such large quantities as the healthy development of a country requires. In France they are so far aroused about this that they are spending many millions in putting the waterways on a totally different footing, both as regards management and construction, from what they have been hitherto . . . . I have no doubt that had a hundredth part of the thought that has been applied to land-carriage of late years been brought to bear upon internal water-carriage, England would have been bene-

fited to the extent of between 40,000,000*l.* and 50,000,000*l.* a year. . . . . A complete system of canals to connect all the great rivers, navigated by boats of 150 tons or so, worked loaded at six or eight miles, and empty at ten, with a charge of one-twelfth of a penny per ton mile, would give England an entirely new start all over the world in her trade." The efficacy of water competition with land transit has been forcibly described by one of the railway kings, Sir Richard Moon, until recently the Chairman of the London and North-Western Railway Company, who, when presiding at the statutory half-yearly meeting of that Company at Euston terminus on February 19, 1882, remarked *inter alia*: "that the sea and canals did more to bring down the railway rates than any competition among the railways themselves." With the frank avowals of eminent railway magnates and other authorities on inland transit as to the great utility and competitive powers of our inland waterways, there is every inducement to endeavour to obtain the full advantage of their utility and its application as a powerful competing factor.

The existing situation appears to be thus: the returns made to the Board of Trade for the year 1888, show that we had in that year in the United Kingdom 3,813 miles of effective inland navigation, and 19,812 miles of effective railways. It is utterly impossible to gather from the returns made to the Board of Trade what the paid-up capital of the inland navigations amounted to in that year. This is no reflection on the Board of Trade, but arises from the fact that most of the railway-controlled waterways have had their capital accounts merged into those of the railway companies. The paid-up capital of the railway companies within the United Kingdom, at the end of 1888, amounted to 864,695,963*l.* As regards England and Wales the fully paid-up capital of the railway companies, at the end of 1888, amounted to 714,036,571*l.*, and of this amount, 573,710,507, fractionally over 80 per cent. is held by twelve leviathan companies. These are respectively, stated in the order of precedence as to amount of capital, as follows: *London and North-Western, *Midland, *Great Western, *North-Eastern, *Lancashire and Yorkshire, *Great Eastern, *Great Northern, London and South Western, *Manchester, Sheffield, and Lincolnshire; London, Chatham, and Dover; London, Brighton, and South Coast; and the South-Eastern. The eight companies distinguished by the asterisks are the owners or lessees in perpetuity of 1,062 miles of inland navigation in England and Wales, out of 1,183 miles under railway control. By a gradual merging process the amalgamation of railway companies has resulted in the consolidation on such an extensive scale as to place four-fifths of the investments in railways in England and Wales in the hands of twelve giant companies, eight of whom have acquired by purchase or perpetual lease the control of over one-third of the mileage of the waterways as regards England and Wales. The prime object in view in this gradual consolidation has been to temper the keenness of competition. It must be conceded that many advantages arise from the centralisation of control, both to the railway companies and the public at large, in lessening working expenses and at the same time affording increased facilities for intercommunication by the mutual co-operation of these great railway systems. George Stephenson laid down the dictum, "Where combination is possible, competition is impossible." This is in a great measure true, because, although there are instances of keen competition between rival railway systems to be found, as a general rule the public are in the hands of the railway companies, and bound by the decisions arrived at as the result of mutual conferences at the Railway Clearing House. As regards competitive factors, the sea and the inland waterways are the most potent; but unfortunately for the public, owing to the difficulty of meeting with the suitable natural conditions, it is only at a limited number of points that the railways can be subjected to the competition of waterways. This highly important consideration should in itself constitute all the stronger reason why we should not neglect such opportunities as do present themselves. We have equally favourable physical conditions existing in the United Kingdom with those in France, suited for the purposes of inland navigation. But we have not turned them to the same account as our neighbours across the Channel.

If, in this country of ours, the spirit of the resolutions already referred to as having been adopted by the Fourth International Congress on Inland Navigation, held in Manchester during the autumn of last year, should influence practical efforts to realise the objects contemplated, some amends will, at any rate, be made for past default. The incorporation of the Manchester Ship Canal Company in 1885 is a forcible exemplification of the willingness of Parliament to give encouragement to enterprise calculated to develop our national resources. The Manchester Ship Canal, if brought, as seems now probable, to a successful completion, may prove to be the pioneer effort in a series of surprising developments. Preston, Sheffield, Nottingham, and Birmingham are all following in the wake of Manchester. What is required to be done is to adapt that remarkable system of inland navigation which had its inception by the construction of the Bridgewater canals, by the Duke of Bridgewater, with Brindley as his engineer, to existing requirements. That system is mainly comprised in a quadrilateral formed by the ports of Liverpool and Manchester (the limits of which are conterminous at Warrington) with the other chief ports of Hull, London, and Bristol. The most important links in the through routes of inland navigation which connect the Mersey, Humber, Thames, and Severn, are those which proceed obliquely through Birmingham from the Mersey to the Thames, and from the Humber through Birmingham to the Severn.

Dealing with the through inland water communication between the Mersey and the Thames, three different routes might be chosen; but any of these would require the utilisation of most of the same links in the chain. The most eligible, as traversing the districts with the greatest traffic requirements, would utilise the undermentioned inland navigations:—

Navigation.	Mileage.	Size of Lock. Lgth. Bdth. Dpth.
River Thames	20	Open navigation.
Grand Junction ...	94	80·0 by 14·6 by 4·6
Oxford	24	72·0 by 7.0 by 4.0
Coventry	27	72·0 by 7·0 by 4·0
*Birmingham	5½	No lock.
Coventry	5½	No lock.
*Trent and Mersey ...	67	72·0 by 7·0 by 3·6
Bridgewater	5½	84·0 by 15·0 by 4·6
River Mersey	15	Open navigation.
Total mileage ...	263½	

The through inland navigation between the Humber and Severn would utilise the undermentioned inland navigations from the Humber to the South Staffordshire mineral districts:—

Navigation.	Mileage.	Size of Lock. Lgth. Wdth. Bdth.
Humber (from Hull)...	18½	Open navigation.
Trent	102	90·0 by 15·0 by 3·4
†Trent and Mersey .	26	72·0 by 9·0 by 3·6
Coventry	5½	No lock.
†Birmingham (estimated	27	72·0 by 7·0 by 4·0
Total mileage ...	172	

From the South Staffordshire mineral districts the through inland navigation from the Humber to the Severn estuary would utilise the undermentioned navigations:—

Navigation.	Mileage.	Size of Lock. Length. Width. Breadth.
†Birmingham...	10	.. 72·0 by 7·0 by 4·0
Worcester	30	... 72·0 by 7·0 by 5·6
Severn.....	30	... 150·0 by 30·0 by 6·0
Gloucester and Berkeley	16	... 100·0 by 24·0 by 6·0
Total mileage...	86	

* These connecting links are under railway contro'.
† Railway-controlled.

From the foregoing particulars it will be seen that the through route between the Humber and the Severn would be 265 miles in length. A Provisional Committee has been formed in Birmingham in order to acquire the existing navigation between Birmingham and the River Severn for their improvement for vessels of 150 to 200 tons. The estimated outlay is 1,890,000*l.* This would include the purchase of the Sharpness and Gloucester Docks. Vessels of 2,000 tons register can be accommodated at the Sharpness Docks, and vessels of 800 tons register can navigate the Gloucester and Berkeley Canal as far as Gloucester, which is about 17 miles from Sharpness. The enterprise is styled the Birmingham and Bristol Channel Improved Navigation. The committee is strong in number and influence, and if they display the energy which the promoters of the Manchester Ship Canal undoubtedly did, they will have no difficulty in obtaining Parliamentary sanction for such an enterprise, and should they proceed with it, and realise their object, a stimulus will be given to other developments of a similar character.

It is scarcely necessary to observe that, although there is a through communication by waterways passing inland from the Mersey to the Thames, under existing conditions such a thing as through traffic is virtually dead. There are six different proprietary interests, and four breaks in the gauge of the locks, and the matter is further complicated by the railway possession of two of the connecting links. The measure of the economy to be effected by the reconstruction of the great trunk routes is demonstrated by a statement handed in to the Select Committee on Canals, 1883 (*vide* Appendix, No. 9), showing that the cost of canal transport as effected between London and Liverpool in two 25-ton canal boats would be 10s. per ton exclusive of tolls, which bring up the amount to 22s. 6d. per ton. If, however, the transport could be effected with three boats carrying 120 tons each, the dimensions being 84 ft. in length, 12 ft. in width, and 6 ft. 3 in. draught, towed by a steam barge containing 90 tons of cargo, making a load of 450 tons in all, the cost would be reduced from 10s. per ton to 2s. 6½d., exclusive of toll for the use of the canal. With regard to the tolls charged, the expansion of traffic caused by the improved means of transport would enable a much smaller toll to raise the increased revenue necessary on a much larger outlay. Probably the most perfect type of land transport in this or any other country is the Aire and Calder navigation, which connects Leeds with Goole. Originally, that navigation was only adapted for barges of some sixty tons. At present the locks upon it are 215 ft. long, 22 ft. wide, and 9 ft. deep. Steam haulage is in operation, and a tender can take through a lock at one passage a train of eleven boats of special construction, each carrying forty tons, making a load in all of 440 tons. The services of only four men are required under this system, the ordinary method requiring the services of twenty-four men. The cost of haulage under this system for general merchandise is $\frac{1}{4}$th of 1d. per ton per mile, and for minerals only $\frac{1}{10}$th of 1d. for the same weight and distance, and even includes taking the empties back. When these coal-boat trains arrive at Goole, there is a large hydraulic lift, which receives each boat after being caged in a cradle into which it is floated. After being secured, it turns over and discharges its cargo into the ship, and in lowering the empty boat or waggon, half the water of the lift is forced back into the accumulator. The speed ranges from 4½ miles to 6 miles an hour. The volume of traffic conveyed during 1888 amounted to 2,210,892 tons. Mr. James Abernethy, C.E., the well-known hydraulic engineer, stated, in evidence before the Select Committee on Canals, 1883, that a canal such as the Leeds and Liverpool Canal could be enlarged to the dimensions of the Aire and Calder Navigation for the sum of 12,000*l.* per mile. The Leeds and Liverpool Canal accommodates boats of about 60 tons (*vide* Report: Questions

and Answers, 1,126-1,132). This sum, of course, is in addition to the cost of acquisition.

The Weaver Navigation is another fine example of adaptation to modern requirements among the few to be found in this country. This navigation connects mid-Cheshire with the Mersey estuary, commencing at Winsford Bridge and terminating at Weston Point Docks, the distance being twenty miles. The vessels trading on this navigation are 90 ft. in length, 21 ft. wide, with a draught of 10 ft., carrying 250 to 300 tons. The volume of traffic in 1888 amounted to 1,498,120 tons. The River Weaver Navigation is a public trust, the surplus revenue being handed over to the county of Chester in relief of the rates. The train-boat system on the Aire and Calder Navigation seems to be the best adapted for through routes from coast to coast. The main object to keep in view, in adapting the inland navigation comprised in the quadrilateral already described to modern requirements, is not so much the provision of through access from coast to coast as to provide access to and from the Midlands for the traffic passing through the Mersey, Humber, Thames, and Bristol Channel ports, affording an avenue for the despatch of a superior unit of bulk. The volume of coast to coast traffic likely to find its way across the land separating the four rivers is very limited in quantity, hence the reason why such an amplification of the existing lateral canals would scarcely justify the expenditure. The greater the unit of bulk, the less proportional cost. Therefore the cardinal feature of any improvement of the inland navigation situated within the quadrilateral should be the provision of such superior means of access to and from the land-locked interior. The acquisition of the various navigations forming the links in the chain of communication would necessarily imply the acquisition of the whole line of navigation, although only a small portion might be required. These, however small in section, would be sure to prove to be excellent feeders to the main avenues suggested. As an illustration, the Birmingham canal navigation, a system 159 miles in length, one of the interests affected, is an aggregation of an innumerable series of narrow barge canals accommodating vessels of 25 tons. Modest, however, as this tonnage is, the traffic upon that system during 1888 amounted to 7,713,047 tons, the average per mile being 48,509 tons. Another small barge navigation system, the Bridgwater canals undertaking of the Manchester Ship Canal Company, which is 40½ miles in length, although only accommodating vessels of 50 tons, was the medium of conveyance of 2,916,754 tons, averaging 72,165 tons per mile. If these small barge canals secure such large quantities of traffic, how much greater a volume may not be expected when the main avenues suggested are provided?

The Manchester Ship Canal, from its geographical situation, must necessarily become the terminal of the Mersey main avenue. The acquisition of the connecting links in the chain of through inland navigation between the Mersey and the Thames, and the Humber and the Severn, and their improvement so as to form the avenues of conveyance for a unit of bulk of 450 tons, would completely revolutionise the present economy of inland transport between the Midlands and the four great commercial rivers. It does not sound a very large figure, but it means a great deal. It is equal to the load of three railway truck trains, with thirty waggons each holding 5 tons. The 528 miles constituting the two intersecting routes, and thus forming four main avenues between the Midlands and the four great ports, would form slightly over one-sixth of the total mileage of inland navigation in England and Wales. But no doubt that canals in direct connection would be absorbed, making at least 1,000 miles, forming one-third part, and situated in the very heart of South Britain. This desirable result would accomplish a number of much-wanted reforms. 1. Diversion of unprofitable traffic from the railways to the waterways. 2. The provision of cheaper facilities for transport. 3. The provision of more systematic services. 4. The arrangement of through routes and rates. 5. Uniformity in gauge of locks. 6. The more efficient maintenance of waterways. 7. The more extended application of steam haulage. 8. The better construction of boats. 9. The advantage of one common administration. 10. Placing the country in a better position to meet foreign competition.

NOTES.

THE Society for the Preservation of the Monuments of Ancient Egypt has issued a circular to its members and supporters, setting forth more particularly the objects of the Society and the detailed nature of the task which it has set before itself. The great mischief appears to be done by the operation of mineral salts in the soil, brought in by the water filtered into the buildings at the time of high Nile, and which crystallise in the pores of the stone, as the water evaporates, and disintegrate it. It is suggested by Grand Bey, the architect to the Public Works Department, that the readiest way to minimise this chemical attack on the lower portions of the walls and columns would be to make channels to give free access to the water at the time of high Nile, which would then enter as pure water, instead of finding its way through the ground and through the foundations and becoming impregnated with these destructive salts brought in with the water of infiltration. This seems a rather heroic remedy, and we should make some question whether this flooding of the temples would not be likely to produce as great mischief to the foundations in another way, substituting one species of attack on them for another. There can be no doubt however, of the necessity of taking measures to repair the damage already done to these great monuments of ancient architecture, and to place them in a state of security from further downfall than they have as yet experienced. We are assured that unless such measures are taken, a number of columns in the Great Hall at Karnac must fall before long, of course bringing down others and doing further damage in their fall. The following is the statement in the circular as to the repairs necessary to place Karnac in security, and the estimate of their probable cost:—

		£
"South Propylon	... Consolidation of base, corroded by infiltrations	60
Temple of Khons	... Threatened ruin from same cause; consolidation of supports	456
Do.	... Clearing out and placing a door ...	164
Shrine of Hathor	... Supports to architrave and column threatening to fall.	10
Temple of Amon	... Clearing out and consolidation of supports	352
Temple of Seti	... Clearing out	60
Great Temple	... Consolidation of foundations, supports, &c.	1,000
Do.	... Clearing of rubbish, and ditch to drain off water	990
North Propylon	... Supports to ceiling ...	20
East Propylon	... Do. ...	12
	Total ...	£3,124."

The Society appeals to those who appreciate the value to the world of these grand relics to assist in providing funds for preventing them from going to ruin.

THE Railway Commissioners delivered judgment last week in a case of considerable interest, which was brought by the Winsford Local Board against the Cheshire Lines Committee. The latter company have discontinued the passenger service from Winsford, on the grounds that the traffic was unremunerative, and also that certain alterations recommended by the Board of Trade (in consequence of an accident) would entail a further outlay on this branch of nearly 6,000*l*. The outlay rendered necessary by the Board of Trade requirements was, however, estimated by the applicants' witnesses at 1,500*l*.; and a further instance of the unreliability of figures in such a case may be found in the estimated effect of the conveyance of passengers on this branch upon the "profit and loss account" of the company. The latter put in a statement showing a loss on a year's working, but the other side had so modified it as to show a balance the other way. The Commissioners, however, put these arguments aside altogether, and gave their decision upon what may be called public grounds. The traffic does not seem to have been large, but it was stated that it was rapidly growing when the service was discontinued, and that considerable inconvenience was caused by reason of the stoppage. The Local Board asked for, and succeeded in obtaining, an order requiring the Company to resume the service, relying on the Act of 1854 (known as Cardwell's Act), which contains the following clause:—"Every railway company shall, according to their respective powers, afford all reasonable facilities for the receiving and forwarding and delivering of traffic upon and from the several railways belonging to or worked by such companies respectively." The company urged that they were in such keen competition with other lines that they certainly would not abstain from carrying any traffic whatever which had a reasonable claim to existence; but Mr. Justice Wills's reading of the Act is that it compels railway companies, whether they like it or not, and whether it pays them or not, within reasonable limits to afford facilities for the conveyance of all classes of traffic. Passengers may, therefore, rest assured that they are regarded by the Railway Commissioners as an important "class of traffic," and that the tribunal will uphold any reasonable attempt to keep railway companies up to the statutory obligations they are placed under in return for the monopoly which has been granted them.

IT appears that public bodies in Scotland have also had their eyes upon Cardwell's Act, and have resolved to appeal to the Board of Trade and the Railway Commissioners to compel the companies whose employés are on strike "to fulfil their statutory obligations." The Edinburgh Town Council have also decided to invoke the intervention of the Board of Trade in the matter. In endeavouring to read between the lines of the conflicting reports as to the real position of affairs, it is difficult to judge how soon, or in what manner, the dispute will terminate. There is no doubt, however, that a serious deadlock is threatened, as the men are not at all unlikely to be joined by workers in other industries before long. The goods manager of an English railway, in a circular dated January 16, says:—"I am advised that the Caledonian Company are now working traffic as usual," but senders and receivers of traffic tell a very different tale. The contest resembles a Parliamentary one in which both sides are confident of victory, for, in endeavouring to convince people that they are winning, the combatants are prone to give undue prominence to slight signs of success.

IT is said that the rather illogical action of the Institute of Architects in giving the sum of money appended to the Soane Medallion while withholding the medallion itself, was due to a fear that they would be criticised for retaining in their own hands funds entrusted to them for distribution. If this was so, it is rather a weak reason to give, for it would surely be easy to add the 50*l*. withheld to the capital, and increase the annual grant proportionately. But this pecuniary question suggests one consideration in regard to the Soane Medallion; viz.: that the sum of money given with it is too small in proportion to what the student must expend in earning the distinction. The condition is that he studies abroad for six months and brings home satisfactory

evidence of his study. Of course 50*l.* will not go very far towards the cost incurred in six months' study abroad, and the consequence may be, and we believe really is, that clever young men with little money to spare are deterred from competing for the Soane,—which is the best thing in point of honour and importance which the Institute has to offer to students,—because they cannot afford the expenditure incurred in complying with the conditions. Fifty pounds was more in Sir John Soane's time than it is now; and if any wealthy and well-wishing person is moved to bestow some of his wealth on the encouragement of architectural study, he could not do it in a more useful way than by adding a thousand pounds to the Soane Medallion endowment, and thus rendering the pecuniary aid to the students a little more proportionate to the honour which undoubtedly attaches to success in this competition.

THE model of Professor Raschdorff's design for the proposed cathedral for Berlin is now on view in the central hall of the Kunst-Gewerbe Museum. The Minister of Public Works and several of the leading architects of Berlin inspected the model on Tuesday last, the two directors of the museum describing the plans, &c., to the visitors. The model, a beautifully-executed one, has been carried out in Professor O. Lessing's atelier according to the drawings of Herr Raschdorff, son of the Professor. The total estimated cost has not yet been stated.

AN interesting statistical paper has been published by Herr Körösi (Director of the Statistical Office at Budapest) on the Municipal Expenses incurred for Public Purposes in several of the Continental Capitals. Berlin has the highest expenses for maintenance of its fire brigade, *i.e.*, 1·69 francs per head of population; whilst the Paris brigade only costs 0·19 francs per head. Assistance to the poorer classes costs in Berlin 5·41 francs per head, in Paris half this figure, in Stockholm only 0·45 francs, and in St. Petersburg and Moscow as little as 0·23 francs; in Vienna, 9·75 francs has been the cost, owing to special circumstances. For educational purposes (lower schools), Berlin pays least, at 9·55 francs per head; Paris pays 9·91 francs, Vienna 10·99 francs, and Amsterdam 12·72 francs. The Berlin police costs wonderfully little—1·15 francs per head; Munich, however, pays still less, 0·61 francs; Paris pays 12 francs; Moscow and St. Petersburg 3 francs under this heading. Street-cleansing in Berlin only costs 1·69 francs per head; Vienna and Paris require 3½ and 3⅓ francs respectively. Whilst Paris pays 7·87 francs for hospital purposes, and St. Petersburg 2·36 francs, Berlin only pays a quarter of this last sum, and Vienna shows as low a figure as 0·54 francs. The lighting of public thoroughfares cost 0·13 francs in Berlin; this is little in comparison to Paris with 3·44 francs, Vienna with 1·33 francs, and Moscow with 1 franc. The laying-out of new streets in Paris has cost twice as much as in Vienna or Berlin, which cities both show the figure 15·65 francs. It would lead too far to go into detail. For those interested in municipal management, Director Körösi's notice will prove valuable. We may, however, mention that looking through the list of municipal debts, we find that Paris has about 780 francs per head; Stockholm, 310 francs; Vienna, 190 francs; Berlin, 154 francs; and Moscow only 11·25 francs.

AS will be seen by a report which appears in another column, the society hitherto known as "The Association of Municipal and Sanitary Engineers and Surveyors" has become "The Incorporated Association of Municipal and County Engineers." The society under its old name did a very great deal of valuable work, not only in forming a bond of union and in offering means (at its general and district meetings) for the interchange of ideas and professional experience, but in improving the status of its members, in the list of whom will be found the name of nearly every leading engineer holding the appointment of Borough Engineer or Surveyor, County Surveyor, or other chief engineering appointment under a municipal or local authority. The Association under its old name numbered some 450 members, and it is hoped that under its new constitution and name its roll will show some increase in numbers. The annual volumes of "Transactions" published during the seventeen or eighteen years of the Association's existence form in themselves a useful library of papers on sanitary and municipal engineering works, replete with details such as only the engineers who were responsible for their execution could give. Of late years the Association has very commendably established a series of examinations for those who are desirous of becoming municipal or county engineers. At the meeting on Wednesday last, Mr. Lewis Angell, the "father" and first President of the Association, read an interesting paper, which was not merely a review of the history and achievements of the Association, but a history of sanitary work during the last forty years.

WE have received an appeal from the Kent and Essex Brickmakers' Protection Association, which has appeared some days ago in some of the daily papers, on behalf of the brickmakers employed in the Kent and Essex brickfields, whose work has been stopped partially since November 25, and entirely since December 18, owing to the weather. It is stated that there is great distress among their families, that the masters have done their best to relieve the distress in their respective fields, but that the distress is so general that they feel justified in making an appeal to the public. Subscriptions will be acknowledged by Messrs. Eastwood & Co., 47, Belvedere-road, Lambeth; Messrs. Smeed, Dean, & Co., and Messrs. Wills & Packham, Sittingbourne; or by the London and County Bank, Sittingbourne.

THE case of the Burnley Equitable Co-operative and Industrial Society, Limited, *v.* Carson, which is reported in the current number of the "Law Reports," is an interesting and useful decision. It decides, according to the head-note of the case, which appears to be accurate, that "a contract of apprenticeship is not invalid by reason of the fact that the master to whom the apprentice is bound is a corporation." The curious thing is, that this important point has not been decided years ago, considering how many times youths have been apprenticed to societies and corporations. The case in question came, in the first instance, before the local justices, who held that the apprenticeship deed was invalid, on the ground that the contract was a personal one, and must be made between an individual master and an individual servant. But it is clear that a company is a recognised body, and in a sense of an individual character, so that there is no reason why it should not enter into a contract with an apprentice as much as into any other kind of contract.

CONSIDERABLE progress has been made recently in the erection of the bridge over the Thames at the Tower, notwithstanding the severe weather. The steel columns for supporting the chains at the Middlesex abutment are now being erected, while the four similar columns on the north pier are all built to the height of 90 ft. above Trinity high-water, and the girders forming the first landing are in place. On the south pier the steelwork is not so far advanced, although the four columns are being proceeded with, and it is expected that all the steel columns on both piers will be built to the full height of 140 ft. above Trinity high-water early in the Spring of this year. The large amount of ice in the Thames has prevented rowing across the river at these works for the last few weeks.

THE *Times* Berlin correspondent in a recent article on the increase of population in Germany wrongly describes the increase of the number of inhabitants in Leipsic as phenomenal, although appearances have also in Germany led to this supposition. The increase from 170,342, of 1885, to 353,272, in 1890, is due to the municipal authorities having thought proper to annex (just before the census) some sixteen of the outside suburbs to Leipsic proper, with the purpose of raising their city to the position of third in the Empire.

IT is announced that a practical examination in bricklaying will be held in June, July, and August, under the management of a joint committee of the City and Guilds of London Institute and of the Tylers' and Bricklayers' Company. The candidates will be limited to thirty in number, who must be operative bricklayers resident within the Metropolitan area. This latter restriction is made, we believe, chiefly because this examination is in the nature of an experiment, and it is desired to try it first on a limited scale. We have no information as yet in regard to the manner of conducting the examination in detail.*

PROFESSOR BANISTER FLETCHER sends us a catalogue of the King's College reference museum on subjects connected with architecture and construction. This includes over 100 constructional diagrams, and a large number of drawings and models of architecture of different styles.

WITH the view of making his skill more generally known, Mr. D. G. Hoey, on Friday, the 16th inst., invited several representatives of the press to inspect the ventilating arrangements lately carried out by him at Messrs. Barclay, Bevan, & Co.'s bank under the superintendence of Mr. J. T. Lee, the firm's architect. Mr. Hoey's work is notable for great care and attention to detail rather than for any remarkable novelty of arrangement. The banking-room, containing about 175,000 cubic feet, and 175 occupants, has its air renewed on an average 1½ times an hour by means of a foul-air shaft, 20 ft. in area, rising to a height of 90 ft. from ground level, while the fresh air is admitted at the lower part of the room. Among the special points we may note the construction of the foul-air shaft with hollow walls, and a strong and accurately-working revolving lobster-back cowl, to prevent the wind blowing down; this is coated with non-conducting material to avoid reduction of temperature. The opening to the foul-air shaft can be closed by a small-mesh wire-gauze screen to lessen the rapidity of current, while if increased power is required, Bunsen gas-burners are provided, whose efficiency is increased by the division of the shaft into sections by iron plates 12 ft. high on which the flames impinge. The fresh air on entering is skilfully directed over the surface of the low-pressure hot-water pipes, by which the heating is performed, and admitted into the room by numerous and finely-divided currents. At the time of our representative's visit, the air of the banking-room appeared somewhat close, though less so than it has been in the past, and on proceeding to the shaft the opening thereto was found to be wholly closed by the wire-gauze screen to prevent too great rapidity and uncomfortable temperature of the incoming fresh air.

THE case of Pickering *v.* the Gun and Shot and Griffin Wharves Company is a case of demand for compensation by a workman for injury sustained while in the execution of his work, in which the rights of the claim were more evident and incontestable than they sometimes are in such actions. The plaintiff was making a ladder on the defendant's wharf; the ladder was projecting a few feet from the end of a shed which, according to

* Applications are to be addressed to the Secretary of the City and Guilds of London Institute, Gresham College.

the defendants, was erected specially to protect the men working, but there is no precise evidence as to this. While the plaintiff was just outside the shed at his work, the sling of a crane broke which was hoisting sacks into a warehouse, and the sacks fell on the plaintiff and so injured him that he was disabled from further pursuing his trade. The defence was "contributory negligence," because the man ought to have been under the shed. Mr. Justice Day quickly disposed of this by recalling attention to the main fact that the sling had broken, and no explanation of this fact had been suggested beyond the obvious conclusion that it was too weak for its work, and he invited the jury to consider whether a workman in a shipwright's yard was bound to run away from his work every time a crane passed over him. The jury replied by a verdict of 450*l.* for the plaintiff. We have not infrequently had to comment on the disingenuous manner in which claims for compensation by workmen are supported; but this is certainly an instance in the opposite direction; an attempt to evade responsibility by directing attention to a side issue.

PROFESSOR AYRTON, in a letter to the *Times*, draws attention to the injury that will be done to the laboratories in the Royal College of Science and in the City Guilds Central Institution by the proposed South Kensington and Paddington Subway. Not only will the vibration caused by the trains be ruinous to delicate operations, but the proposal to work the railway by electric power will bring this disturbing element into such close proximity as to "make even rough electrical experiments impossible." Professor Ayrton hints at one practical argument which may reach even the mind of the railway speculator, when he asks whether the promoters of the proposed scheme have ever contemplated the amount of compensation which would be demanded, if the question of compensation were once entertained?

IN *L'Art* for Jan. 15 there is an illustrated article on the celebrated Spitzer collection of Mediæval work, of which many objects were in the loan exhibition in the Trocadéro in 1889; and also notes of a journey in the South of France, with some sketches of the characteristic Romanesque churches of Puy de Dôme and the upper Loire, by M. Pierre Gauthiez.

IN our issue of August 24, 1889, we published illustrations of the staircase and garden-front of the old Manor-house at Wandsworth.* From two letters recently printed in the *Times*, we learn that the building materials of the house, including the timber, have been sold for about 370*l.* The staircase, together with the painted panels on the chief landing, had been previously removed, and the portrait of Queen Anne (from the ceiling of the room that was called by her name), the dining-room mantelpiece, and other portions of the interior woodwork, as also the outer cornice, pediments, the carved monogram, &c., have been carefully preserved. A set of sixty-two old Dutch painted tiles illustrated a variety of Scriptural subjects in chronological sequence. According to Manning & Bray's "History of Surrey," the house was, in all probability, built for one Peter Paggen, who died in 1720, and was buried in the graveyard close by. This house has played its part as the scene of some of the domestic quarrels and political intrigues which preceded the downfall of the Stuart dynasty; from it the Princess Anne wrote to her father, asking for forgiveness, and her husband another letter wherein he undertakes to take cause with William of Orange in the event of his coming to assume the crown.

AMONG our illustrations this week is a set of drawings of the porch of the fine church at Southwold, a small town which has arrived of late years at the dignity of being a fashionable watering-place, though it is not very easy to understand what are the attractions which gave rise to its popularity. The town is a tolerably large one of its class, but straggling, unpicturesque, and dirty, and reminding one a good deal of some of Crabbe's descriptions of seaside places on this coast; it lies low, has nothing attractive in its general appearance, and presents a steep shingle beach, one of the most uncomfortable kinds of beach for a watering-place lounge. Some of the older small houses facing the sea (in great request as lodgings in autumn) have a certain original character of their own; the new houses which have been recently built at the north end of the town front, in answer to the demand for accommodation, are mostly of the ugliest and most uninviting type. On the other hand one breathes an air there, "when the wind blows in from the sea," which is like drinking draughts of life, and there is very pretty country near at hand: Walberswick being a well-known haunt of artists, which in summer is dotted all over with the protecting umbrellas of sketchers. The town is reached from Halesworth junction by a short three-foot gauge line of railway of an agreeably primitive description, with carriages like tramcars, which wind up and down hill and jolt round corners as if one were driving through a country lane rather than on a railway. This approach, in summer especially, through meadows rich in flowers, is attractive enough; but Southwold itself, excepting the air and the church, is rather a disillusion.

THE Royal Academy have elected Mr. Brock, the sculptor, and Mr. A. C. Gow, the painter, previously Associates, as full Academicians. Mr. David Murray has been elected an Associate. Mr. Murray has earned the distinction, though one cannot help thinking of other landscape painters who have been longer known and whose powers are yet higher, who are most unaccountably passed over. Possibly the new Associate's patronymic may help to explain the selection. "Promotion," we are told, "cometh neither from the east nor from the west nor yet from the south," leaving obviously only one other quarter available—at Burlington House, at all events.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE PRESIDENT'S ADDRESS TO STUDENTS.

THE sixth ordinary meeting of this Institute for the present session was held on Monday evening last, at 9, Conduit-street, Mr. Alfred Waterhouse, R.A., President, in the chair.

Mr. J. Macvicar Anderson proposed a special vote of thanks to Mr. William C. Alexander (Hon. Associate) for his gift to the Library of twenty-six volumes of Didron's "Annales Archéologiques,"—a valuable gift.

Mr. Octavius Hansard seconded the motion, which was heartily received.

The President then read the following address to students:—

Colour in Architecture.

I have been somewhat doubtful upon what subject to address you on this the last occasion on which I shall have the privilege of saying a few words to the students from this chair; and in finally selecting as my theme the treatment of colour in architectural design, I would point out that the recent most generous augmentation of the studentship dealing with this subject affords a special occasion for attention to this sometimes neglected branch of our work. I need not remind you that on the death of Miss Jones, the last surviving sister of our late lamented and highly-gifted *confrère*, it was found that she had bequeathed all her remaining property to the very excellent studentship for the encouragement of the study of colour as a means of architectural decoration, which had already been founded by her and by another sister previously deceased, as a memorial to their brother. Though addressing myself primarily to the younger among this company, I feel that my remarks will be heard by several who may well feel it hard to listen to a discourse from one who in so many ways ought to be their disciple rather than their instructor, and to them I would say that I do not wish in the least to dogmatise in a matter so eminently one of personal taste. I will merely express some of my views as arrived at by experience, and propose, in subdivision of my subject, to speak first of external colouring, and next of internal decoration as applied both to pavements and to walls, with a special reference in the latter case to the use of glazed tiling or faience.

Until very lately, the modern school of architects gave little or no concern to colour. Drab was the genteel hue. Venetian red or yellow ochre had to be tolerated rather than enjoyed when we descended to brickwork. Lately our ideas have been revolutionised. Ruskin, with a pen which fired our imaginations with descriptions of colour-harmonies more bewitching than those which emanate from many a painter's brush, set our minds aflame for colour. Other influences in the same direction have also been at work, but the result is not always what could be desired. Two reasons may be assigned for this result: one, our national inaptitude for the task, our want of the true instinct for colour, which we see so infallible in the arrangement of dyed wools used in a Persian or an Indian carpet; or, rather, which we always did see before we forced our excruciatingly unpleasant aniline dyes upon the carpet-weavers of the East; another, our climate, which requires far more attention and care to avoid colour contrasts in violation of good taste than is needful in sunnier climes. The varied hues of a collection of ordinary Italian houses, which look right enough, and are, in fact, charming under an Italian sky, would not be tolerated in England. The fact is that bright sunshine is a great colour-harmoniser, and as we are not blessed with too much of it in this country, we ought to be the more careful in our combination and contrasts of colour. Effects of colour which have delighted us in southern latitudes have been made note of and reproduced by us at home with but sorry result, and I believe one reason for this to be that we cannot reckon on the sun putting a glaze upon our chromatic crudities. Then, again, though we must reckon without the sun, we cannot reckon, at any rate in towns, without the smoke which envelopes us with ever-increasing density; and which, after our fires are over and Spring comes round once more, we find has left its dirty finger-marks on those portions of our buildings which are most susceptible to its influence. This presents another difficulty to the chromatic artist. However skilfully he may have arranged his colours, and however satisfied he may be with the effect produced thereby when the building leaves his hands, still, if the material which furnishes one colour is more susceptible to smoke as a blackening agent than that or those which furnish others, the colour effect is changed, and, it may be, not improved.

The only material that I know of which is absolutely improved by smoke, especially if the style employed be columnar, is Portland stone; and it is a happy thing for London that its use has been so common among us, for it and soot seem made for each other, and are sure to marry happily. Harmonies in black and white, however, can hardly be called great achievements in colour. Do not suppose that I would not strive after other well-assorted unions, only in all other cases we must look upon soot as a most undesirable but certain factor whose alliance we have to do our best to defeat. The union of brick and stone, and of stones of different densities, and of bricks of different hardness, presents these difficulties: the stone and the soft brick get black, and the hard bricks retain their colour more or less in proportion to their density. Glazed tiles in combination with stone are, of course, quite inadmissible for the above reason, and even polished granite combined with freestone is of doubtful expediency. Emery-polished granite, which secures for the material all its colour, without that reflecting surface which mars its repose and prevents its happy union with the surrounding stonework, is to my mind, when granite is to be employed, by far the best suited for exterior effect. Highly reflecting surfaces kill form, and so do colour contrasts to a certain extent. We may conclude to prefer a colour effect to the distinct discernment of form, and do so rightly in certain cases, but we must, I think, always know when we are sacrificing form to colour: it must be done from choice and not by accident; and when changes of colour are introduced into forms

* See also the *Builder* of June 22, 1889, "Surrey Archæological Society: Meeting at Wandsworth;" and our "Note" of May 11, same year.

which are studied, and intended to produce a definite effect, the disturbing effect of the colour should always be taken into consideration.

It is a most interesting question to us how far the application of pigments on the buildings of antiquity enhanced their beauty. Judging, for instance, from some of the learned polychromatic restorations of the holders of the French Grand Prix de Rome, I should prefer Greek Temples in their present aspect to their effect when bedizened with their pristine splendour of colour; but, perhaps, after all, the student with all his research may have been mistaken, not as to the use of polychromy (that cannot be doubted), but as to its exact application. On the other hand, there are fragments of Greek buildings bearing original colour, as for instance certain bits in the Museum at Palermo, which give one nothing but delight. Again, one is tempted to feel that the Mediæval art, which happily still survives in this country and France, could not have been always improved by the colour with which it was frequently overloaded. I prefer its present aspect; but it must not be overlooked that time has been busily at work not only in the effacement of the original pigments, but in treating the work with a colour decoration of its own in the way of lichen and weather stains.

Former ages, even the most refined, were not only tolerant of excess of colour, but delighted in it in a way which would be repellent to our present peculiar phase of civilisation. Compare the sobriety of colour which characterises the works of this generation of painters with those of the artists who flourished before Raphael, and you will see what I mean. I do not assert that all colour must be abandoned in this critical age, but that it has to be used with reserve and judgment if it is to find acceptance with the phase of cultivated taste peculiar to the present day. Violent contrasts should, perhaps, be avoided, and most certainly discordant ones. There are two strong contrasts which always, I think, affect us agreeably: the black and white marble of the Italian Gothic churches—as that at Genoa, and the yellow and red of Verona and its neighbouring cities. But what we call white is now yellow, and the colours which look well in S. Zenone are not so satisfactory when adorning a chapel in Paddington or Bayswater. As I said before, England is not Italy.

The scientific exploiters in clay are now able, out of the same clay, to get two or more different colours on the same block. They do this by increasing the proportions of some of the natural constituents of the clay affecting the colour (the iron and the alkalies), by the addition of soluble forms of either element. These additions can be localised by limiting the evaporation of the soluble elements to certain spaces. Colours so obtained will, I believe, invariably harmonise with each other. Perhaps in this way, in developing the resources of the clays beneath our feet, and in the blocks of terra-cotta made from them, we may aim, with the aid of science, at subtle and agreeable changes of colour, securing a surface so dense as to be proof against atmospheric destruction and disfigurement; and at the same time avoid reflecting surfaces which, if periodically washed, would disturb the eye by their glitter. It appears to me that this is the direction in which the future external colour decoration of our city architecture must develope.

I am hardly able to explain what it is within me which rebels against marble statues against a stone front; it is more than the mere incompatibility of the two materials, which when new never agree, and which causes the statues, when the stone has attained its full measure of sooty disfigurement, to look almost ghastly in their cold obtrusiveness, and which serves only to teach us this lesson, that glaringly light objects destroy the forms of the features against which they are set. Less offensive is the still objectionable practice of using a lighter coloured stone for statuary against the darker stone of the building. I have seen red Mansfield Woodhouse stone so used against ordinary dark red sandstone in a work which seemed to me, with this exception, of great merit; but such a contrast of colour in a work where no colour contrast was intended did something to destroy the unity of an otherwise admirable piece of work.

Coming to floors, I suppose the most satisfactory pavements the world has ever seen are those composed of slabs of purple porphyry and green serpentino, surrounded and set in bands and interlacing circles of white marble; smaller patterns of these three colours, almost always severely geometric, being interspersed to give interest and complexity to the whole and enhance the apparent dimensions of the larger pieces. Nothing of the kind that I know of is equal to this *Opus Alexandrinum* in beauty and fascination, in the splendour and costliness of the materials, and the depth and refinement of their colour, of a contrast just strong enough to bring out each other's attractions, and yet not destroy the harmony of the whole pavement. No doubt the stains of the softer white marble which age has brought with it make some of the floors of the earliest Italian churches and basilicas even more lovely now than when they left the lapidary's workshop. We have one well-known example at home in the shrine of the Confessor in Westminster Abbey; but such sumptuous pavements can now be only rarely indulged in. The introduction of other marbles and other colours is nearly certain to lower the character of the pavement, but perhaps the most harmless admission to this matchless combination of purple, green, and white is *giallo antico*, as one element in the smaller geometric patterns.

The manufacture of tiles for pavements has been almost ruined by the folly of their makers in pandering to the undeveloped taste of a public delighting in gaudy and inharmonious colouring, so that cultivated people shudder at the very mention of them; but I need hardly say that there is nothing in tiles, the manufacture of which has now been brought in England to very great perfection, which will not lend itself to very beautiful arrangements of colour both for floors and walls, if architects gave themselves the trouble to study the effect of the tiles themselves upon each other before their final selection. No coloured drawing can with safety be relied upon. This precaution, of course, is as necessary for wall tiles as for those used in pavements.

In place of tiles, the revived *opus insertum* of the Romans has lately come much into vogue among us. The beauty of these pavements of small marble tesseræ principally arises, I suppose, from the softness imparted to them by the slight variation of colour in the so-called white marbles. Black and Sicilian marbles are the kinds ordinarily employed, and none are more effective, with perhaps central panels of some dark red limestone where depth of colour is desired. The principal objection to the employment of this *opus insertum* is the softness of the Sicilian white or grey marble, which consequently wears down much more quickly than the black or red; so that I have known a pavement subjected to much traffic which had to be renewed in less than twenty years. A floor of tile tesseræ, on the contrary, is very permanent, but is much harder in tone than those of marble. This could, perhaps, be overcome if the manufacturers would give us twenty different shades of ivory and pearl to use for our so-called white spaces instead of a uniform snow-white, and if their reds and blacks also were supplied in similar variety. I believe then that our actual prejudice against pavements of ceramic tesseræ would speedily disappear, and that we should be able to combine arrangements of this very permanent material at comparatively slight cost which would satisfy a fastidious taste. Glass tesseræ are open to the same objections as those made of tiles, but are capable of the same judicious treatment. Some very fine combinations of blue and grey are already to be seen. The advantage of greys of various tones in place of pure white may be seen in any bit of Gris de Flandres ware. Cover the greys of half such a pot with a coating of Chinese white, and the value of the grey will soon become apparent; or even look at the sky; its blue, when interfered with at all, is, in broad daylight, interfered with not by *white* clouds, but with vapour not only of indefinite variety of form, but of varying quality and intensity of grey, sometimes so warm as to approach orange, and sometimes as cold as pure indigo, but always grey as compared with the blue vault of heaven over which they sail.

I have reserved for the close of my few remarks on colour as a vehicle of architectural expression what I have to say on the use of faïence in this connexion. I alluded to this subject in my address at the opening of this session, because I cannot help thinking that the architect ought to impress his building permanently with his own ideas as to its becoming colour, just as he does as to its appropriate form, and I see no way of doing this so satisfactorily as by the use of faïence, certainly internally, and it may be in certain cases in towns externally also. I say in towns, because I suppose we should never wish to use in a pure atmosphere a material on which nature, as time goes on, could not leave here and there her delicate pencilling. It would be foreign to my present subject to enlarge on the dangers to be guarded against in the use of faïence; of the necessity for the greatest care, where it is not structural, that the backing should be of quick-setting cement, so as not to allow of undue absorption by the brickwork of the wall behind before it has time to set; and also on the necessity for grooving or roughing the backs of the tiles themselves to secure thorough adherence to the rendering. What I would here insist upon as connected with our theme,—for I am one who has been taught by bitter experience,—is never to trust to a mere drawing in the colour combinations: always to insist on seeing the faïence blocks and tiles themselves in juxtaposition, remembering, however, that arrangements of colour which appear perfect in single pieces, will really be far too strong when you get them in a mass upon your walls. This is the hardest lesson to learn, I have not learnt it yet in practice, but I have observed that the treatment of some small room whose modest dimensions have demanded the very faintest contrasts of tint and tone, has, in consequence of this treatment, given me much more satisfaction than the arrangement of colours in larger apartments where a more ambitious combination of colour has been attempted. The actual scheme of colour in each case must be left to your own good taste and imagination, avoiding absolute white—unless it may be very small quantities—and strong contrasts, as destroying breadth, repose, and scale. My own predilections are for pearly greys and drabs inclining to ivory, red or green, with very small points of delicate turquoise blue; but, as I said before, I would not dogmatise in any way.

Nor will I take up your time with saying anything about what we may do with different woods in our joinery and cabinet-work, and in the way of tarsia work in each of these: except to remind you that there are several examples of the latter work at the last Exhibition of Arts and Crafts, some of the most ambitious, in my humble judgment, sadly overloaded with ornament. That shows, in my opinion, the advantage of the architect's direction in such work. He may not be able to design an arabesque panel better, or perhaps as well as an artist who devotes his life to such work; but he may know, and generally does know, where to stop. It is infinitely better to have too little ornament, if that little be but the outcome of our best thought, than too much. In the embroidery room of the same Exhibition the same thought struck me. It was those pieces, and those only, in which, the forms being well studied, the colours were delicately combined, which one would have liked to take home with one and live amidst.

I must not close my remarks without a final word on the subject of glass. Windows are made to admit light, and, where there is anything of a pleasure-giving character outside, to see through. When these two objects are sufficiently attained we are better off with an 18-in. brick wall between us and the heat or cold of the exterior than with more glass. When we do not want to see through our windows they may be filled with glass more or less coloured. Now here is another pitfall awaiting us: our clients sigh, it may be, for something which they call cheerful—that is, glass of glaring colour—and if you are not made of sterner stuff than I have sometimes found myself composed of, they will have it at your hands, or get it elsewhere. Whereas, if they only knew beforehand what would really satisfy them, they would have been glad of something more approaching in colour an opal or a pearl. Of all the stained glass with which the churches of this country have been flooded within the last half century, there is not one bit in a hundred that could not very easily be spared. In the majority the drawing is bad, the sentiment is mawkish, and the colour, which is the real excuse for shutting out the cheerful light of day, is the worst thing about these stained-glass windows; and yet there they are for all time, unless conflagrations, or another revolution conducted like our first by iconoclasts, intervene to rid us of them. The old glass we could ill spare; but, with some few rare exceptions, it is different as

regards that which has succeeded to its place of honour.

Of the work of the decorative painter, of subject-pictures on walls or ceilings, in fresco or spirit medium, and of mosaic pictures, I will say nothing because time is too short. I will content myself by recommending those of you who have not yet been to Sicily, and who have a desire to prepare your thoughts for service in the direction we have been turning our thoughts to-night, to visit Palermo and Monreale, where you will see the most splendid and at the same time the most refined interiors that I suppose we have any knowledge of. This Saracen work, under Norman guidance, glows with colour like the rainbow, but there the similarity ceases, for it is as permanent as the latter is evanescent. Tall slabs of Cipollino clothe the lower parts of the walls for about 15 ft. with an ever-changing embroidery of greenish grey; then comes a horizontal band of white marble with inlay of glass mosaic in the form of pines, and in geometric patterns, like those on the tomb of the Confessor. The same bands surround the doorways. Above all this, on walls, vaults, arches, and window recesses, there is nothing but glorious mosaic pictures, generally on gold ground, every angle rounded to carry this splendid material.

We cannot hope to repeat such glories except on very rare occasions, and on a small scale, but they form one of the architectural sights of the world. Let it suffice for us to bring a delicate sense of refinement to our work, and give our best thought to the application of our colour, as we already do to the design of our plastic work. In this direction we have a chance of our handiwork being somewhat original, as we may go to nature for our colour motives to a greater extent than we can for our forms. An afternoon at a museum among shells and birds need not be thrown away upon the student of colour. He will there find many subtle harmonies that have never been attempted in human work; he will thus draw his inspiration from the highest source, and adorn the surface of his architecture with colour combinations never before attempted for such a purpose.

Professor Aitchison, A.R.A., at the conclusion of the address, said he had personally to thank the President for his most fascinating discourse, which was full of suggestiveness. They were also under deep obligation to him for pointing out those pitfalls which beset the use of colour. He had only this to say on the subject of architectural colouring, which was, that although he greatly admired the profession for its utter disregard of remuneration, still if they had to design the arrangement of colour as well, they would be even in a worse position than they were at present, for they now were the poorest of all the professions. The only thing he would say about colour, which was a charming study in itself and excellent for every one who could afford the time for it, was, that there were only a few to whom the gift of colour was vouchsafed, and that those who did not possess the gift, when they used it, were simply a misfortune to the rest of mankind. He would also say to persons who attempted to deal with colour, that unless they thought it of paramount importance they should by all means withhold their hands from it, and study whatever other subject they felt they had a bent towards. The very idea that the houses in this dusky city, and in the still duskier provincial manufacturing towns, would show splendour of colour, and be of material which could be washed with a sponge, was a most fascinating one, and one he had been long hoping for. He was afraid, however, that he would not see it in his time, though the younger generation, he believed, might live to see it. Then, instead of dusky, smoky, and miserable-looking cities, they might be as splendid as M. Charles Garnier hoped Paris would become, if proper attention were paid to the use of enamelled pottery and glass mosaic. He quite endorsed the President's remarks on the splendour and admirable effect of *opus Alexandrinum*, and he thought a tribute was due to the unfortunate Emperor, Alexander Severus, who was the originator of its use. Of course, in a poverty-stricken country like this, we could not expect to imitate the things which were done by the small republics of Greece or Italy. Still, something might be done one day, when England became rich, and, in that case, he did not know any better material than *opus Alexandrinum* for the pavement of large halls and churches. As the President had said, the great point of the whole design was, that there were squares or circles of green or red porphyry, and round those were *guilloches*, or straight bands filled with triangles and squares of red and green porphyry, and occasionally with black and *giallo antico*. Porphyry of all shades of colour existed in Sweden, Norway, and Denmark, and the advantage of using it for outside work in this climate was that it did not perish, and that in pavement it was polished by the foot, whereas marble only scratched, losing to a great extent its colour and value in the combination. As far as pottery was concerned, all who might visit France should take the opportunity of seeing the grand frieze brought by M. Dieulafoy from the Palace of Darius at Susa. This frieze showed what might be done by using so common and cheap a material as brick, the colour in it being quite a study for what monumental colouring should be. It was, however, intended to reflect the bright sun of Persia, and would have to be modified to suit the gloom of this country, but it would be seen how very few colours had been used, and those not of the most brilliant description, and yet a majestic effect had been gained. With respect to ornament, if a man did not know exactly how to use it, he should by all means avoid it as much as he could, and not put in anything which made a flat wall worse than it was before. On the other hand, if a man was a master of the art, he could not have too much of it. It was just the same as in war—a poor general might only be able to handle a small army, but if he was a great soldier, the larger his army was the more absolutely certain would be his success. Those who had the real mastery of colour, therefore, might use it with the greatest profusion. There were many remnants of mosaic in various parts of the world, and although he had made use of it in rooms, and he hoped with tolerably good effect, yet it was a monumental material, and as such should be generally used in large buildings, and at some considerable distance from the eye, because, although the outlines of it might be made almost as perfect as a drawing, yet, generally speaking, it was rather rough, and required distance to make it perfect. He had long hoped to see the backs of the porticoes in London, and in the principal provincial towns, resplendent with mosaic. The most beautiful examples of mosaic he had seen were those of San Vitale, and the Tomb of Galla Placidia at Ravenna. The groined ceiling over the altar at San Vitale was, to his mind, the most lovely piece of ornamental work he had seen, and the magnificent figure-work in some of the panels was beautifully done. There were also very fine specimens to be found elsewhere, at St. George, Salonica, and at "the Monastery in the Country" at Constantinople. The two large slabs of mosaic at the back of the altar at San Vitale, the one representing Justinian and the other the Empress Theodora, were two of the finest mosaics he had ever met with. Professor Aitchison concluded by proposing a vote of thanks to the President for his excellent address.

Mr. Purdon Clarke, C.I.E., seconded the motion. He said he rather deprecated the idea that the infamous climate of this country should prevent the use of bright colour, because he believed bright colour might be used, which would harmonise with the atmosphere of sooty London. He had had the fortune to see some of the brightest colouring, not only under the bright skies which were so common in Italy, but also under very different aspects. He had resided in Rome and Venice for considerable periods, and had seen fogs in both those cities. In fact, he could affirm that he never saw St. Mark's at Venice look better than in a thunderstorm. He remembered one occasion when the weather was almost as murky as it could be in London, but the way in which the gold tesseræ and bits of bright blue here and there flashed through the darkness was such, that he felt that if the whole thing could have been transported to London, it would have done a great deal to brighten even our darkest days. He had heard the colour of the Alhambra spoken very much against on account of its crudeness, but excused with the remark that it did very well in Spain. He believed the weakness of the imitations had always been caused by the want of paying proper attention to the qualities of the colours. Even in the matter of vermilion, there were many shades, and its selection was not a thing to be left to the workman. With regard to the question of mosaic, the modern makers had been very much to blame. In 1872, when he returned after two years' work in the Basilicas of Italy, he could only get gold tesseræ in England, or even of the Salviati make, of a perfectly uniform shade, like yellow looking-glass; but the old tesseræ were found to vary very much in tone. The modern glaze was very thin, and of a uniform thickness throughout; the old varying, on the contrary, from $\frac{1}{32}$nd of an inch to $\frac{1}{16}$th of an inch over the gold. It was in the varying thickness of the glaze that the beauty consisted, it being like hammered gold compared to something rolled out on a machine. The green, too, was varied from the green through to the blue, with scarlet smudges here and there, which all added to the effect. They had still a good deal to find out about the colours which were used, and the methods of their application. He believed Colonel Jacob could tell them something of the mediums used in the bright fresco colouring of Jeypore, where they produced frescoes equal to anything that was found in Pompeii, especially in the mediums for making reds. Red lead was used largely in the East, and he had seen it in places close to the smell of bad drains, and yet there it had stood good for a hundred years. In this country red lead was considered to be a colour which would not stand; but it seemed that in India the natives had methods of making it permanent.

The vote of thanks was then put and carried by acclamation.

Presentation of Medals and Prizes.

The President next presented the prizes to the successful competitors, a list of whom appeared in our columns last week.

Mr. Charles Barry, at the close of the presentation, said it was a matter of regret that none of the designs sent in for the Soane Medallion had been deemed sufficiently good to absolutely merit entire success; the money, therefore, only had been divided. He believed that in this competition the Medal was considered of more importance than the money; and he therefore hoped that the Council might see their way to present some kind of testimonial in the shape of a medal of merit or a certificate to the recipients of the money this year.

The President said that the Council would give their consideration to the matter.

Architectural Details from Jeypore.

The President then introduced Colonel Jacob, who, he said, had attended at the invitation of Mr. Barry, and who would be willing to tell them something about the work done at Jeypore in educating the native workmen,—the draughtsmen who had produced the Jeypore portfolios of architectural details which had been presented to the Institute by the Maharajah of Jeypore.

Colonel Jacob, C.I.E., of the Bombay Staff Corps, said that it was more than thirty years since he went from England to India, and it was rather a formidable thing to find himself now in the presence of such an audience, especially as he had not had the privilege of being brought up as a professional architect. He might say that he had a great desire to be one, and although he went out originally in the Artillery, fortune had led him into the Public Works Department,—not that that was, perhaps, always a thing to be desired, still it was the groove which gave him a start in Jeypore. Fifty years ago there was not a road there, and even twenty-five years ago one often had to ride on camels or horses. Through the liberal policy of our Government, public works had been fostered, and through the liberality of the Maharajah, and his desire to make his State occupy its proper place as one of the leading States of Rajpootana there were now not only 250 miles of metalled road but also waterworks with a constant supply which had been the free gift of the Maharajah to his people. There are more than 100 irrigation works of all sorts; there had been erected two large cotton presses, gasworks, excellent public gardens, a large hospital, and about twenty-five dispensaries in the Districts. And now, thanks to the liberality of the Maharajah and the great interest which has been devoted to it by the Civil Surgeon, Dr. Hendley, C.I.E., there is an excellent museum. In commemoration of the visit of the Prince of Wales a building had been constructed called the Albert Hall, which he had been asked to superintend. As the building was intended to be a museum, it was considered that it would be interesting to intro-


W. H. HEMMANT Esq
"BULIMBA"
SEVENOAKS
Porch
Lobby
Billiard Rm
Library
Area
Larder
Kitchen
Scullery
Pantry
Linen
Boots
Drawing Rm
Morning Rm
Dining Rm
Garden Entrance
Gent
Pantry
House-keeper
Day
Servants' Hall
GROUND PLAN
E. SALOMONS & A. STEINTHAL
ARCHITECTS.





duce, where circumstances permitted it, in the details and in the decoration, good examples of Oriental art, so that the walls themselves might be part of the museum, and many instances of beautiful work in Delhi and Agra had been made use of. The Archæological Department of India had done a great deal to preserve the old buildings, and had given plans and sections of many of the most important of them. At the same time, we could not afford to erect such buildings now, and the details which the Archæological Department had given were often on such a small scale as to be almost useless for practical purposes. What occurred to him was to make use of some of the details which were already existing, and to put them into such a shape that they should be useful also to others. The building material in Jeypore was chiefly marble. There was a great deal to be gained by taking the workmen into one's confidence, and showing them that one was trying to do something which would be true and beautiful. It might be interesting to say how the native workmen made copies of the details. They first took the paper and drew the pattern with a pencil, pricking it through, placing it on the surface, and dusting it with a bag of powdered charcoal. This went through, and when the paper was removed there was a dotted outline, which could be pencilled in. If this were done on marble, the surface was first covered with red ochre, and when the dotted lines were scratched in there was left a white outline on the red ochre. When the building was finished, the Maharajah was kind enough to sanction the drawings being reproduced by photo-lithography, and a copy of the whole has been presented to the Royal Institute of British Architects. The interest which attached to these drawings was that they were entirely the work of native artisans. These drawings had been executed by the sons of masons, and he believed it would be difficult to get any English masons' sons to draw such things. It showed the influence of early training in drawing. Colonel Jacob desired to say how much was due to Mr. Cosens, of the Archæological Survey of Western India, who allowed the Jeypore draughtsmen for three months to attend his office in Poona, and personally instructed them how to ink in the work. Nor did he forget the help which had been so kindly given by Dr. Burgess, Superintendent of the Archæological Survey of India, and other friends. In conclusion, Colonel Jacob added that much more might be said, but his chief object in coming forward that evening was, not to make a speech, but to express his thanks to the President and the Council for the encouragement he had received in the very kind way in which they had accepted the copy of the "Jeypore Portfolios of Architectural Details," which he had had the honour to present to the Institute on the part of H.H. the Maharajah of Jeypore, and also for the permission to exhibit the specimen drawings on the screens that evening.

Mr. William Simpson said he had been to Jeypore twice, and had seen some of the buildings erected for the Maharajah. The great interest of the drawings exhibited that evening on the screens was that they were the actual work of native artists, and the closest inspection even only showed the marvellous delicacy and steadiness of the lines. They had not quite our English ideas of art, but in ornament they surpassed us. He wished the other rulers of India would follow in the steps of the Maharajah of Jeypore by giving details of Indian architecture. His only grumble was that there was in these works too much of the later Mohammedan work,—what he might term the Shah Jehan ornament, when the European influence had come into India, and which the natives had never got well into assimilating. There was just a little too much of that in these books, and he should have preferred more of the old Hindoo art, of which there were plenty of specimens in Rajpootana. He would therefore ask Colonel Jacob, on his return, to give them the old Hindoo work, and not so much of the work of the Shah Jehan period. The publication of the portfolios was an event in the history of Indian architecture, or in the study of it. The plates numbered 375, and were a magnificent addition to the knowledge of Indian archæology and art. He proposed a cordial vote of thanks to Colonel Jacob.

Mr. Purdon Clarke seconded the motion, and added that in many instances the original drawings looked better in this climate than the actual casts. Delicate work in relief, which in India looked perfect, in London, owing to the want of sharpness of light, seemed gummy and indistinct. The drawings, however, gave the effect of the strong sunlight which in India made the sharp shadows. It was a reproach to our Government that after 200 years of British rule in India, they had so little to show in this direction, and that the first wise gift should have been made by a native ruler. With the exception of the first part of a work by Major Cole, which the Indian Government did not continue, and Fergusson's excellent book on India, they had little to show, while Napoleon, during the short time he was in Egypt, and notwithstanding his military occupations, promoted the production of a wonderful work on that country.

Mr. Charles Barry added that it ought to be known that the interest taken by the Maharajah of Jeypore in these matters had been largely due to the influence of Major Jacob.

The vote of thanks was then adopted, and Colonel Jacob suitably replied.

The President announced that the next meeting would take place on the 2nd prox., when a paper would be read on "The School of Bramante, and its Expansion through Europe," by Baron Henry de Geymüller (Hon. Corr. Member).

The proceedings then terminated.

THE ARCHITECTURAL ASSOCIATION.

THE adjourned special business meeting of this Association for the consideration of such of the By-laws as had not been already passed* was held on Friday evening, the 16th inst., Mr. Leonard Stokes, President, in the chair.

There was a very thin attendance, and it was only after the lapse of some little time that the necessary quorum of twenty-five members was got together.

The President announced that as Mr. Stannus was unable to be present, owing to the inclemency of the weather, he would ask Mr. Hampden Pratt to formally move the adoption of the By-laws as yet undealt with, beginning with number XXI., which was as follows:—

"21. All moneys belonging to the Association, and not invested, shall be deposited by the Committee, on account of, and for the use of, the Association, with a banker, in the county of London."

Mr. Farrow seconded the motion.

Mr. Brodie moved as an amendment that the word "Treasurer" be substituted for the word "Committee," and that a transposition be made in two of the sentences of the By-law as drafted, so that in its amended form it should read as follows:—

"21. All moneys belonging to the Association, and not invested, shall be deposited by the Treasurer with a banker in the county of London, on account of, and for the use of, the Association."

The By-law as thus amended was agreed to.

Mr. Pratt moved the adoption of By-law XXII., as follows:—

"22. The Librarian shall, subject to the control of the Committee, have charge of the Library; and shall render a financial account and report to the Committee at the close of each Session."

Mr. Farrow seconded the motion, which was agreed to without discussion.

Mr. Pratt moved the adoption of By-law XXIII., which as presented by the Committee read as follows:—

"23. The duty of the Committee shall be, to conduct the affairs of the Association, to report to the general body of Members at the close of each Session, and to issue to Members, not later than the first week in September in each year, the publication known as the 'Brown Book,' which shall contain, besides the Report of the Committee, and the Balance-Sheet for the past Session, a complete list of the arrangements made for the Session."

Mr. T. E. Pryce seconded the motion.

After a brief discussion certain verbal amendments were agreed to, and the By-law, as adopted, reads as follows:—

"23. The duty of the Committee shall be to conduct the affairs of the Association; to present the Annual Report to the general body of members, and to issue to members, not later than the first week of September in each year, the publication known as the 'Brown-book,' which shall contain, besides the report of the Committee and the Balance-sheet for the past session, a complete list of the arrangements made for the current session."

On the motion of Mr. Pratt, seconded by Mr. Pryce, By-law XXIV., as follows, was agreed to without discussion:—

"24. The retiring Committee shall, at the last meeting but two of each Session, bring forward a list of Members willing to serve as Officers for the ensuing Session; to which, upon nomination by any two Members at the next succeeding meeting, may be added the names of other Members willing to serve; and this shall be the Voting List for the Election. Scrutineers shall be appointed at this Meeting to count the votes prior to the next meeting."

Mr. Pratt next moved, and Mr. Farrow seconded, the adoption of By-law XXV., as follows:—

"25. Voting papers, containing the names in alphabetical order, of all persons nominated to the various offices, shall be forwarded to all Members whose subscription is not more than one Session in arrear. The Voting Papers shall be filled up and returned to the Secretaries on the date mentioned therein, and they shall hand them unopened to the Scrutineers, who shall count the Votes and report the result of the Election at the last General Meeting of the Session."

This was unanimously agreed to.

On the motion of Mr. Pratt, seconded by Mr. Farrow, By-law XXVI. was agreed to, as follows:—

"26. The office of President or Vice-President shall not be held by any Member for more than two consecutive years. Of the ten ordinary Members of the Committee not more than seven shall have served in the same capacity in the preceding year, and no ordinary Member of Committee shall serve as such for more than three consecutive years."

Mr. Pratt moved and Mr. Earle seconded, the adoption of By-law XXVII., as follows:—

"27. If a vacancy shall occur on the Committee, notice of such vacancy shall be given to the general body of Members; and after the lapse of two weeks, the Committee shall, at a General Meeting, nominate a Member to fill such vacancy. At this meeting any two Members may add the names of any other Members willing to serve; and the election shall take place by show of hands at the next General Meeting."

This was also agreed to.

Mr. Pratt moved the adoption of By-law XXVIII.

Mr. Pryce seconded the motion, and, after a few words from Mr. Hudson, the By-law was unanimously agreed to as follows:—

"28. Two Auditors, whose sole duty shall be to audit the Accounts for the Session, shall be elected annually at the same time, and in the same manner, as the Committee. The Auditors shall not be upon the elected or retiring Committee. One only shall be eligible for re-election; and neither shall hold office more than two consecutive Sessions."

Mr. H. W. Pratt moved the adoption of By-law XXIX., as follows:—

"29. The Committee shall have power to appoint an Honorary Solicitor, a Registrar, two Assistant-Librarians, and any paid officials to assist in the work of the Association at such remuneration as may be deemed expedient."

Mr. F. T. Baggallay seconded the motion, which was carried.

Mr. Pratt next moved, and Mr. Farrow seconded, the adoption of By-law XXX., as follows:—

"30. A Register shall be kept of the names of architects requiring assistants, and of assistants requiring engagements. This shall be free to all Members, but a fee of one shilling shall be charged for the registration of non-members."

This was agreed to, as were also By-laws XXXI. and XXXII. (each being moved and seconded by Mr. Pratt and Mr. Pryce respectively), as follows:—

"31. The Ordinary General Meetings shall be held from October to May; as far as possible, on alternate Friday evenings, commencing at half-past seven o'clock, and concluding as near half-past nine as practicable. Papers shall be read and Discussions take place at these Meetings. Each Member shall have the privilege of introducing one visitor, either personally or by ticket."

"32. The first General Meeting of each session shall be the Annual General Meeting; at which an audited statement of the accounts of the Association shall be laid before the Members; together with the Report of the Committee for the previous session, for the consideration of Members; the prizes shall be distributed; the President shall deliver an address; and short addresses be also invited from senior Members of the profession."

Mr. Pratt then moved the adoption of By-law XXXIII., as follows:—

"33. A Special General Meeting shall be called by the Secretaries when required by the Committee; or at any time not less than two weeks, nor more than eight weeks, after the receipt of a requisition, stating the purpose for which the Meeting is required, and signed by twelve Members. The presence of twenty-five Members shall be necessary to constitute a quorum at any such Meeting; and in either case the Agenda of business to be considered shall be duly advertised at least one clear week prior to the Meeting; and no other business shall be taken at such Meeting."

Mr. T. E. Pryce seconded the motion.

To this Mr. Cresswell moved, and Mr. Hudson seconded, an amendment to insert the words, "one or more of the professional journals," after the word "advertised."

This was lost, it being explained that that course was quite open to the Committee under the rule as proposed.

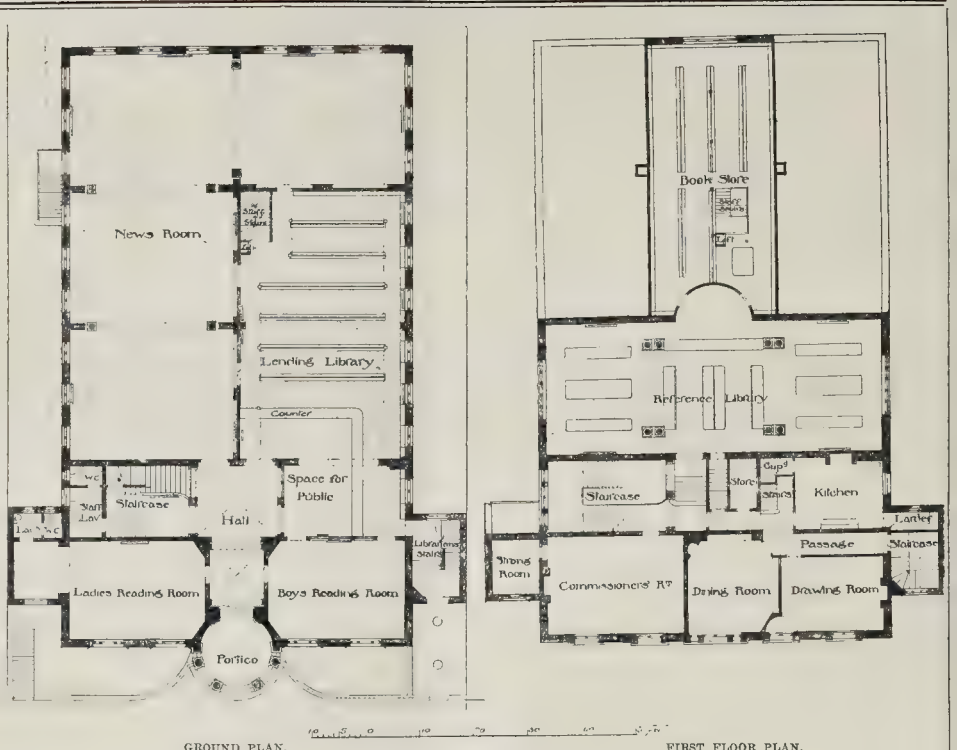
The original proposition was then agreed to.

Mr. Pratt next moved the adoption of By-law XXXIV., as follows:—

"34. The Session shall commence on the first day of June in each year; and terminate on the last day of May in the year following."

Mr. Earle seconded the motion, upon which a long discussion ensued as to the advisability of continuing the annual *conversazione* of the

* For the reports of the previous meetings, see the *Builder* for December 20 and 27 last, pp. 480 and 496.



GROUND PLAN. FIRST FLOOR PLAN.

Chelsea Central Library: Plans.

Association, and whether or not words should be inserted in the By-law giving the Committee power to hold a *conversazione*.

Mr. Leverton complained of the increasing expenditure of the *conversazione*, and that the character of the entertainment provided had not kept pace with the increased outlay upon it. At the same time he did not wish to see the *conversazione* altogether given up, and he therefore moved as an amendment to insert the words "A *conversazione* may be held at the beginning or end of each session."

This amendment was lost, it being explained by the President that the Committee already had discretionary power in the matter.

After some further conversation, the motion for the adoption of the By-law as above set out, was agreed to.

Mr. Pratt next moved the adoption of By-law XXXV., as follows:—

"35. The Committee may alter the dates of Meetings, but they shall announce all changes of arrangement, and Special General Meetings, by advertisement, in one or more of the professional papers."

Mr. Farrow seconded the motion.

Mr. Baggallay moved and Mr. Cresswell seconded as an amendment that the By-law should read as follows:—

"35. The Committee may alter the dates of meetings, but all changes of arrangement shall be duly advertised."

The amendment was carried.

Mr. Pratt next moved the adoption of By-law XXXVI., as follows:—

"36. All voting shall be taken by show of hands, and the question decided by the majority, except as herein provided to the contrary. In any case of equality the Chairman shall have a casting vote."

Mr. Pryce seconded the motion, which was agreed to.

The Chairman next moved the adoption of By-law XXXVII., which, as originally drafted, read as follows:—

"37. Any alteration or amendment to the Constitution or By-laws of the Association shall be proposed in writing by at least twelve Members, or by the Committee, at a General Meeting; discussed at a Special General Meeting held not less than two weeks or more than eight weeks subsequently, due notice of which has been given; and voted upon at the Meeting by a show of hands."

The Chairman explained that it had been found necessary to remodel this By-law, so as to make it agree with Rule XII. of the Constitution, which had already been passed.

After considerable discussion relating to verbal amendments, By-law XXXVII. was finally agreed to in the following terms:—

"37. Any alteration or amendment to the Constitution of the Association shall be proposed in writing by at least twenty members, or by the Committee at a General Meeting; discussed at a Special General Meeting held not less than two weeks, or more than eight weeks, subsequently, due notice of which shall have been given. The proposal in its final form shall be voted upon by means of voting papers, which shall be sent, together with a full report of the discussion, to all Members. These voting papers to be returned to the secretaries, who shall hand them unopened to the two scrutineers who shall be appointed by the Special General Meeting. The result of the voting to be made known at the next General Meeting. No alteration or amendment of the Constitution shall be carried unless by a two-thirds majority of those so voting."

The Chairman said that it would be necessary to pass another By-law not included in the By-laws as originally drafted, which would be By-law XXXVIII., which, on behalf of the Committee, he begged to move as follows:—

"38. Any modification of the By-laws shall be proposed and discussed in like manner as provided in By-law XXXVII.; the final voting being taken by show of hands at the Special General Meeting at which the proposed modification is discussed. But no alteration shall be carried unless by a two-thirds majority of those so voting."

This was agreed to unanimously.

On the motion of Mr. Pratt, By-law XXXIX. was unanimously agreed to. It reads as follows:—

"39. The Constitution and By-laws as herein contained, and as hereafter amended or enlarged, shall be binding on all Members; and their membership shall be taken as assent thereto."

By-law XL., the last on the list, was then, on the motion of Mr. Pratt, also agreed to. It is as follows:—

"40. The form of application for Membership shall be that appended hereto.

[NOTE.—The present Form of Application for Membership, to be altered, on lines 11 and 12, in 'Brown Book,' p. 17, to: "I hereby agree to pay the sum of *Two Guineas* as an Entrance Fee, together with the First Annual Subscription of *One Guinea*." The third line from bottom to be: "Every Nomination Paper *shall* be accompanied by a letter, &c."]

After one or two amendments, having for their object the insertion of By-law IX. (relating to the amount of Members' subscriptions) in the Constitution had been discussed and defeated,

Mr. Cresswell moved and Mr. E. S. Gale seconded, "That the Constitution and By-laws as passed be agreed to as a whole, subject to any verbal revision which the solicitors of the Association might advise."

The motion was unanimously agreed to.

On the motion of Mr. Baggallay, seconded by Mr. Pryce, the old Rules of the Association were declared to be rescinded, and the proceedings concluded with a vote of thanks to the Revision Committee for the time and care which they had devoted to the subject.

Illustrations.

THE CENTRAL LIBRARY, CHELSEA.

THIS new building, which has just been completed, is in Manresa-road, Chelsea. It is built of red brick, with stone dressings, and the roofs are covered with tiles. The ground-floor comprises a large newsroom for 200 readers, a lending-library, and ladies' and boys' reading-rooms. On the first floor is the reference-library, the book-store, the Commissioners' room, the Librarian's residence, &c. In the basement is the caretaker's residence, the work-room, and other storerooms.

The building has been carried out from the designs of Mr. J. M. Brydon, F.R.I.B.A. The general contract has been taken by Messrs. Holloway Bros., of Battersea; the fireproof floors are on Messrs. Homan and Rodger's system; the warming has been entrusted to Messrs. Berry & Sons, of Westminster; the carving is by Mr. Aumonier; and Mr. Edward Rogers is clerk of the works.

Our view is taken from a drawing lately in the exhibition of the Royal Academy.

At the time of the competition for the building we published the elevation and the ground-floor plan. The plan has been somewhat modified and improved in execution, and therefore we now give the ground and first-floor plans as executed.

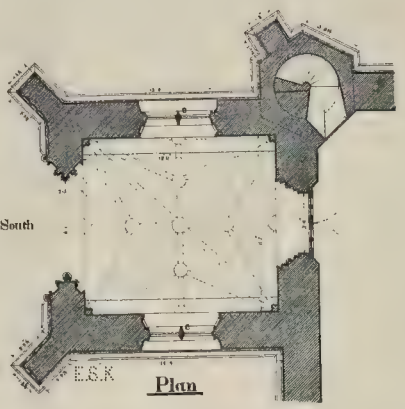
The building was opened on Wednesday last by Lord Cadogan.



DESIGN FOR DRAWING ROO

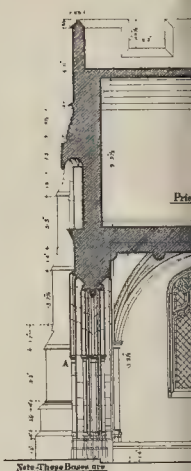


TION. By Mr Thos. W. Hay



Plan

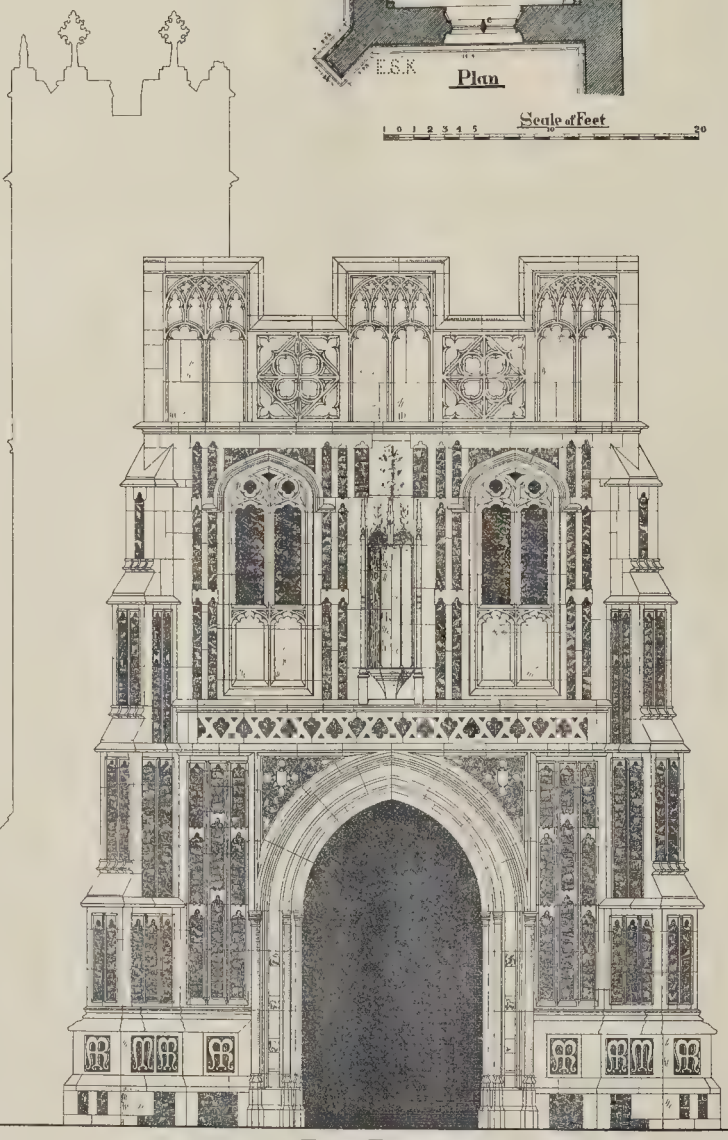
Scale of Feet



Sect

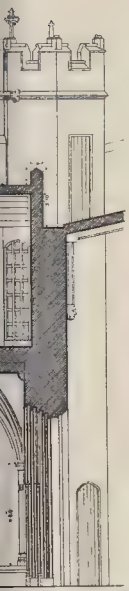
Porch of St. Ed

Sout



Front Elevation

Scale of Feet

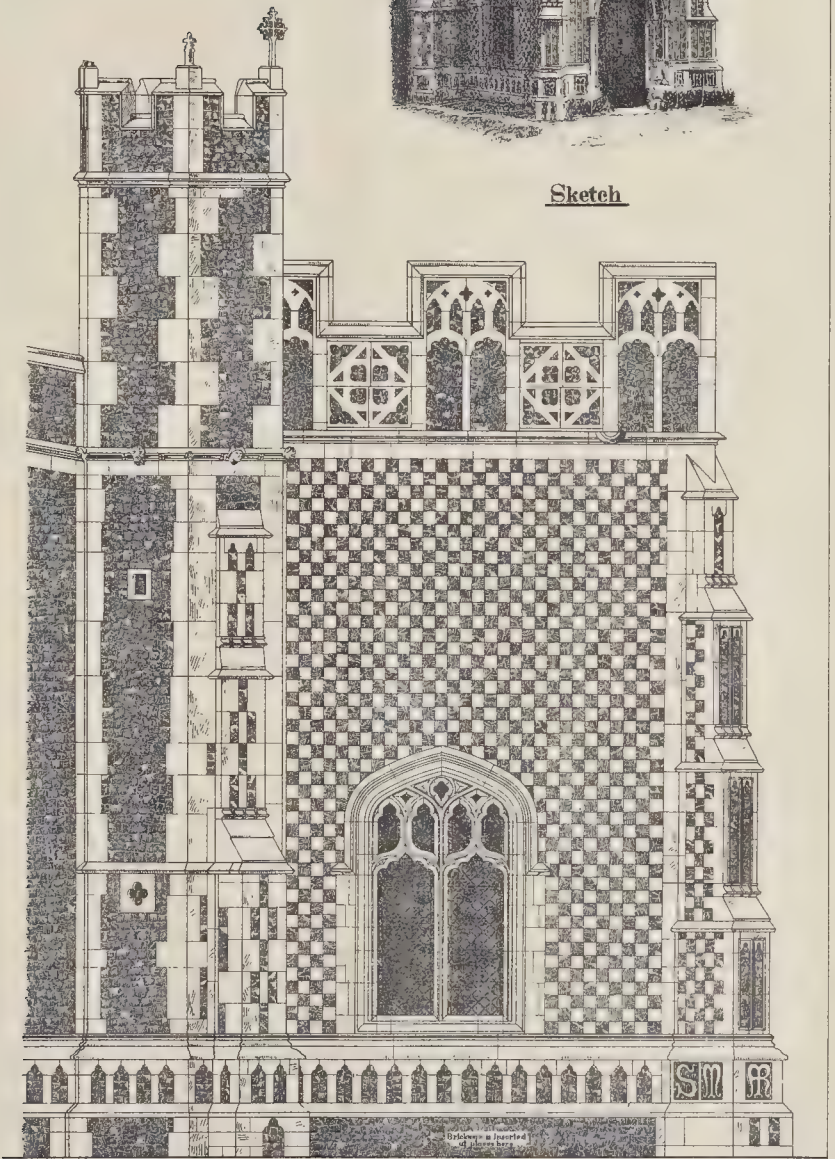


Note-The stone joints were plotted on the spot.

sChurch

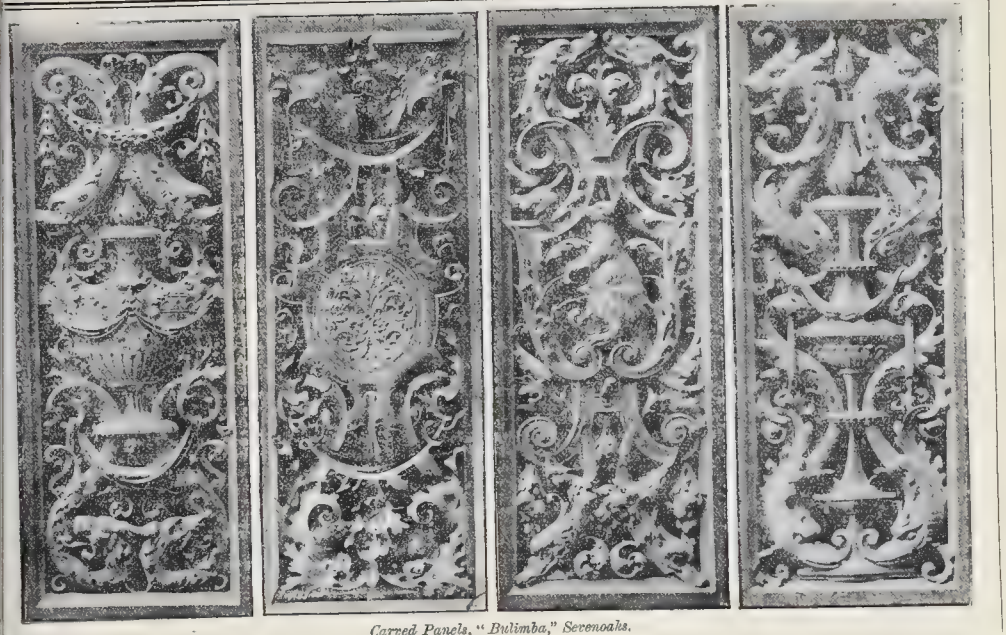


Sketch



Side Elevation

PHOTO LITHO. SPRAGUE & Co. 22 MARTIN'S LANE, CANNON ST. LONDON E.C.



Carved Panels, "Bulimba," Sevenoaks.

"BULIMBA," SEVENOAKS.

THIS house stands on well-timbered grounds which slope from Kippington Church southwards, commanding a beautiful view from the terraces.

The external walls are built of Kentish Rag set in cement, with Bath stone dressings.

The *motif* of the design was suggested by the tables of Knole Park. The hall, to be used as a living hall, will be finished all in oak, with dado 6 ft. high, the staircase and arcading will also be in oak with carved panels, &c. The large window lighting the hall will be fitted with stained glass by Messrs. Standring & Co., of Manchester. The ceilings of dining-room and library will be in oak, varied in design. The walls of dining-room will have high panelling with chimney-piece and sideboard designed with it, the panels in the walls being filled with tapestry. The drawing-rooms will have mahogany dado and chimney-piece relieved with bronzed enriched mouldings; the frieze and ceiling, &c., as well as the ceiling and frieze to morning-rooms, will be in rich plaster work; all this being executed by Messrs. Heighway & Co. All the doors are of oak and mahogany fumigated, the furniture and hinges having been specially designed by the architects, and made by Messrs. Smith & Co. The floors of the hall and entertaining rooms will be laid with parquet by Messrs. Illingworth Ingham & Co. All the upper lights of mullioned windows will be filled with stained glass by Messrs. Lavers & Westlake. The principal bath-room will have solid marble bath, with marble dado, &c., the latter made by Messrs. Pattison.

A special feature is made of the loggia entered from the principal bedroom, and from which there is a charming view. The walls and floors are finished in marble mosaic of special design, and executed by Messrs. de Greille, Houdret, & Co., who have also done the rest of the mosaic flooring in the house, verandah, &c.

The general contractor for the building is Mr. D. Baker, of Folkestone. Mr. G. Jennings has carried out the sanitary fittings. Mr. Millson has executed the whole of the stone and wood carving. The warm-air apparatus has been fixed and provided by Mr. Langfield. Mr. E. P. Wright is clerk of works, and Messrs. E. Salomons & A. Steinthal are the architects.

We append illustrations of four carved woodwork panels, which form a portion of the decoration of the interior.

DESIGN FOR DRAWING-ROOM DECORATION.

THIS design, by Mr. Thos. W. Hay, shows the elevation of a drawing-room wall, exhibiting a Renaissance treatment. The angles are splayed to form niches, having bronze figures of Apollo and Minerva. The frieze is a band of gold ornament on a blue ground. Within the architectural framework on the walls are tapestry panels with figure subjects with an ornamental border, the pilasters dividing the compartments having imitation Limoges enamel panels. The chimney-piece is in various marbles, with figures of "Spring" and "Winter"; on the shelf are two gilt bronze candelabra. The dado is in walnut and ivory inlay. The opening on the right shows a conservatory, to have a sliding glass door.

PORCH, ST. EDMUND'S CHURCH, SOUTHWOLD.

THE church at Southwold is a typical late East Anglian church with a tower with buttresses treated in a design in flint and stonework; the south porch presenting a more elaborated example of the same kind of work. The interior shows the usual spacious-looking nave with rather thinly proportioned piers, and a once rich rood-screen which shows plenty of remains of the elaborate painted decoration common in the churches of this part of the country.

In the porch it will be observed that the design of the battlement panels is produced on one face by moulded tracery, and on the other by a repetition of a similar design in flat work.

The illustrations are from a careful set of drawings by Mr. Percy K. Allen.

THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A general (statutory) meeting of this Association (hitherto known as the Association of Municipal and Sanitary Engineers and Surveyors) was held at the Institution of Civil Engineers, 25, Great George-street, Westminster, at noon on Wednesday last, Mr. H. P. Boulnois (City Engineer of Liverpool), President, in the chair.

The first business was to receive the report of the Council on the Registration and Incorporation of the Association. This was read by Mr. Thomas Cole, the Secretary. We quote the most salient portions of it:—

"We now bid adieu to the Association of Municipal and Sanitary Engineers and Surveyors, after its successful career of some seventeen years, during which time the work has been carried out in connexion with the sanitary organization of the country which has left its impress upon the various departments of the community, from the country village to the great centres of metropolitan industry. And under the presidency of men of well-known position in the sanitary world, it has progressed from a comparatively small beginning to a position of recognised influence and importance. The time having now arrived in which the fresh developments of Parliamentary action in connexion with the division of municipal work amongst newly-formed bodies, County Councils, and others, has led those who have had the management of the Association to take the necessary steps to bring about the formation of a more comprehensive body than could possibly have been the case under the regulations of the old Association, and in introducing the Incorporated Association of Municipal and County Engineers at its first meeting, the Council desire briefly to put before the members a *résumé* of the steps taken, so as to be an official record of the inception of a step which it is hoped will be of great importance in placing the society on a more solid basis than hitherto has been the case.

Some four years since a good deal of attention was given to the question of applying for a Royal Charter, and a minute in the annual report of the Council in July, 1887, referred to the question of expense, besides other considerable difficulties to be overcome, and it was then pointed out that registration under the Companies' Acts would meet our requirements, and the Council were still considering the advisability of registering under these Acts pending future action in reference to obtaining a Royal Charter. * * *

The Committee appointed at the last annual meeting to take the necessary steps, after many meetings, finally settled upon the necessary Memorandum and Articles of Association. These the Council adopted, and they were duly submitted to the Board of Trade. Amendments were made by the Board, which in their turn were reconsidered by the Committee, and the application was at last advertised in the *Times* of June 14 last. Finally, the Certificate of Incorporation, dated September 22, 1890, was received on the 24th of the same month.

The process of change from the old Association to the new is effected by the signing a formal transfer of rights of membership. This form (Form F) has been sent with a copy of the articles of association to every member for signature. It may be interesting to note that up to the present 321 members have thus subscribed their names as now belonging to the new Association. It is hoped, however, that the full roll of the old Association will, in a short time, be included. It may also be here worthy of note that in sending in their forms, when members have taken the opportunity of commenting, the opinions have always expressed unqualified approval of the step taken by the Council.

The first and most important alteration made in passing into the new body is the change in title. Many suggestions were fully discussed and put aside, finally resulting in a title embodying, first, the municipal engineers, which has always been the *raison d'être* of the Association, and secondly, the "County," as including engineers holding appointments under recent Acts of Parliament as well as including the the present County Surveyers. It was decided to drop the title "Sanitary" and also the

term "Surveyors," it being understood that the title "Engineers" includes "Surveyors." Finally, the prefix "Incorporated" has been inserted by special desire of the Board of Trade. In the consideration of this matter the Council have kept in view the desirability of shortening the somewhat cumbersome old title, and, although much has not been actually achieved in this direction, the result is probably as short as is consistent with the necessities of the case.

With the object of increasing the Association's usefulness to its members, the Council recognise very fully the importance of encouraging candidates who pass the examinations subsequently attaching themselves as Graduates to the Association. It is felt that these gentlemen, in this way, have opportunities of gaining an immense amount of valuable practical information that cannot be acquired by any other means. The number of Graduates who, upon their holding chief appointments, have been transferred to the list of members is a significant fact as pointing to the advantages of the class; and with a view of inducing all those certificated candidates to join, the Council has reduced the annual subscription of Graduates from one guinea to half that sum.

The preparation of the Articles of Association has been done with the assistance and counsel of Mr. Pritchard, solicitor, of Messrs. Sharpe, Pritchard, & Company * * *

In conclusion, the Council trust that the incorporation of the Association will have the desired effect of increasing the public confidence in the examinations, and the value of the certificate granted to successful candidates; that those who hold the certificate will be induced to join as Graduates, deriving thereby an immense amount of useful knowledge and practical experience from their attending meetings and visiting works; and, lastly, it is hoped that the step taken, involving considerable expense and outlay of time and trouble, will be met by members exerting themselves to strengthen the Association by bringing in fresh members and loyally helping, in every possible way, to make the newly incorporated body a continued and an increasing success, and a means of mutual help and of invaluable professional assistance in the important public positions they are called upon to occupy."

On the motion of Mr. Farrell (Sherborne), seconded by Mr. Mann (Sevenoaks), and supported by Mr. J. P. Norrington (Fulham), the report was received and unanimously adopted.

Mr. Lewis Angell, F.R.I.B.A., M.Inst.C.E., Borough Engineer of West Ham, and the first President of the Association, then read a paper entitled "Municipal Work and Sanitary Progress," in which he reviewed the past work of the Association, and referred to the part which it had taken in the advancement of sanitary progress. We have no space to give any portion of the paper this week, but there were a few points in it to which, if space permit, we hope to return next week.

On the motion of the Chairman, seconded by Mr. Charles Jones (Ealing), hon. sec., the thanks of the meeting were tendered to Mr. Lewis Angell for his interesting paper, and the meeting terminated.

LECTURES AT UNIVERSITY COLLEGE.

PROFESSOR REGINALD STUART POOLE began the second term of the Lectures on Archæology, on the afternoon of the 14th, by an introductory address, in which he stated the unusual arrangements which had been made for a successful course of instruction to students. He said that as Babylonian archæology was taught by the monuments and writings of Babylon in the same way as Greek archæology was by the sculptures and paintings of Greece, he had secured the very valuable aid of Mr. W. St. Chad Boscawen, who was competent to teach the former subject with *emphasis*, as compared with many men quite as learned as himself, who seemed as if they could only present colour without its light and shade. Professor Poole said we were more indebted to the Babylonians than to the Greeks for the beginnings of the arts and sciences, and for the earliest attempts to measure out the earth, and this even more so, strangely enough, than to the Egyptians. Much interest had been created by the discovery of stones near St. Paul's with very early Babylonian inscriptions. These had evidently been brought to this country as ballast some centuries ago. He stated that he had also secured the co-operation of Prof. Roger Smith, Professor of Architecture in University College. After thirty-nine years' study of Greek archæology, he (Prof. Poole) was convinced that the best possible method of teaching it was by coins, and these might be compared with sculpture. We had no remains of Early Greek painting except in two colours. Painted frescoes had been found in Rome and elsewhere bearing faint resemblances to the reality, but Early Greek painting is practically lost to us. Four lectures would be given by Mr. Cecil Smith on Greek vases, and the new and more logical arrangement of the treasures of the British Museum would be most helpful in this course; indeed, his (Prof. Poole's) and Mr. Boscawen's work would be equally divided between the lecture-room and the galleries of the Museum.

Mr. Boscawen was then asked to say a few words introductory to his subject. He said that he had prepared an exhaustive bibliography, carefully classified, by which students would be able to see what books were available for their help. He would first deal with the general subject of the locality of Babylonia, and he remarked that one must know the physical features of a country to be able to study its civilisation. This was the source from which they would obtain a knowledge of the manners and customs of a people, as well as of the foreign influences brought to bear on them. He would be able to present many facts that were perfectly new; and in reference to the stones found near St. Paul's said that it was known that there had been some such in this country for two or three centuries. In the gallery rounds, the subject of the religion of Babylonia would require to be taught by translations of texts to be found in the museum; and he remarked that, although we were rich in many departments of Babylonian monuments, yet in the section representing the earliest period the Louvre contained more wealth than our collection. Mr. Boscawen encouraged the students to learn the cuneiform writing, which only required a good memory and perseverance. He impressed upon them the propriety of constantly using the pencil and note-book, and to be always copying.

Professor Poole next spoke of the great success which had attended a class for the teaching of hieroglyphics which he had conducted for some time, and expressed his opinion that as there were many ways of transcribing those characters—one by Maspero, and different methods by others—it was deeply important that students should personally become acquainted with the monuments themselves. They must all bear in mind the undoubted fact that it was quite impossible to dissociate the language of those primitive civilisations (Babylonian and Egyptian) from the knowledge which the language conveys.

On Monday afternoon Mr. W. St. Chad Boscawen delivered, in the section of Archæology, the first of five lectures on the "Principles of Babylonian Archæology," the subject being the component elements of Babylonian civilisation. In commencing his lecture, Mr. Boscawen said that the discoveries of the last few years had tended in a wonderful manner to increase the value of the study of the archæology of the Babylonian empire. The discoveries of Sir Henry Layard, more than forty years ago, had shown the immense influence which Assyrian art had exercised upon Greek art; but Assyrian art in its main features was the outcome of the teaching of Chaldean masters, and the students who sought to draw nearer and nearer to the cradle of art in Western Asia looked with anxious eyes for the discovery of some products of the Chaldean artists. The discoveries of M. de Sarzec had supplied this want, and had shown to us that there existed a native school of Chaldean artists whose work was of the highest character. In the study of the archæology of an ancient people, it was necessary, first of all, to have some knowledge of the geographical and physical features of the country in which they dwelt. Mr. Boscawen then described the principal features of the Lower Tigro-Euphrates Valley, and how they had exercised an influence upon the art of the people. The scarcity of stone necessitated expeditions to distant lands, and the quarries of Sinai supplied the sculptors of the age of Gudea, B.C. 2,500, as they had supplied the kings of the fourth and sixth dynasties in Egypt. In Chaldea as in Egypt we met with the same remarkable phenomenon, that the earlier the art the more true to nature was its character. Mr. Boscawen then instanced the statues of Gudea now in the Louvre, and one remarkable piece of work, a sacrificial bowl sculptured with lions' heads, which, were it not for the inscription upon it, might have been taken for an example of early Greek art. The lecturer then proceeded to show that this work was due to the practical Akkadian artists, to whom neither time nor hardness of material seemed to have been difficulties. Huge masses of diorite, porphyry, basalt, and black granite were sculptured into most artistic forms, and covered with minutely-cut cuneiform characters. He then pointed out how this artistic instinct was to be traced at a much earlier period in the cuneiform signs themselves. He next compared the early hieroglyphic forms of Egypt and Chaldea, and also described the remarkable discovery of the connexion between the writings and languages of China and the Euphrates valley. The mixed ethnic character of Babylonia, and its position as a centre of culture, was shown by numerous languages employing the cuneiform mode of writing, it having spread in various forms all over Western Asia. One of the most remarkable and astonishing features of this spread of Babylonian civilisation was its introduction into Elam, to the east of the Tigris, where it was learnt by the Bak tribes, who in about B.C. 2400, by one of those strange movements so peculiar to Central Asia, proceeded to drift slowly eastward, and in time entered China by the north-west provinces, bringing with them a system of writing and the elements of a civilisation, and with certain legendary lore manifestly of Babylonian origin. This important discovery, first suggested and partially elaborated by Professors Terrien de Lacouperie and Douglas, had now been substantiated in a most detailed manner by the studies of the Rev. C. J. Ball. One result of the discoveries in Babylonia and of the spread of Babylonian civilisation, both eastward and westward, must be to establish for its birth an immense antiquity. The question as to the relative antiquities of Chaldea and Egypt is still unsolved, but the predominance of evidence seemed at present to be in favour of Chaldea. Researches in Egypt had shown that the fauna, especially the domestic cattle of Egypt, were of Europo-Asian origin, and that the Egyptian cultured elements of the time of the fourth and sixth dynasties were also of Asiatic, and not African, origin. Egyptian civilisation had gone up the Nile, and not down the Nile, and it was remarkable to notice in the same manner that the seat of the earliest Chaldean civilisation was in the south, and grew younger as we passed up the dual rivers. There was a commercial touch between Egypt and Babylonia as early as B.C. 3,000; and, although the question of the antiquities of these civilisations was unsettled, the lecturer said that the archæological research of the last years had opened up hitherto dark passages of the labyrinth of time, and taught us the immense importance of the study of these first stages on the pathway of culture.

THE LONDON COUNTY COUNCIL.

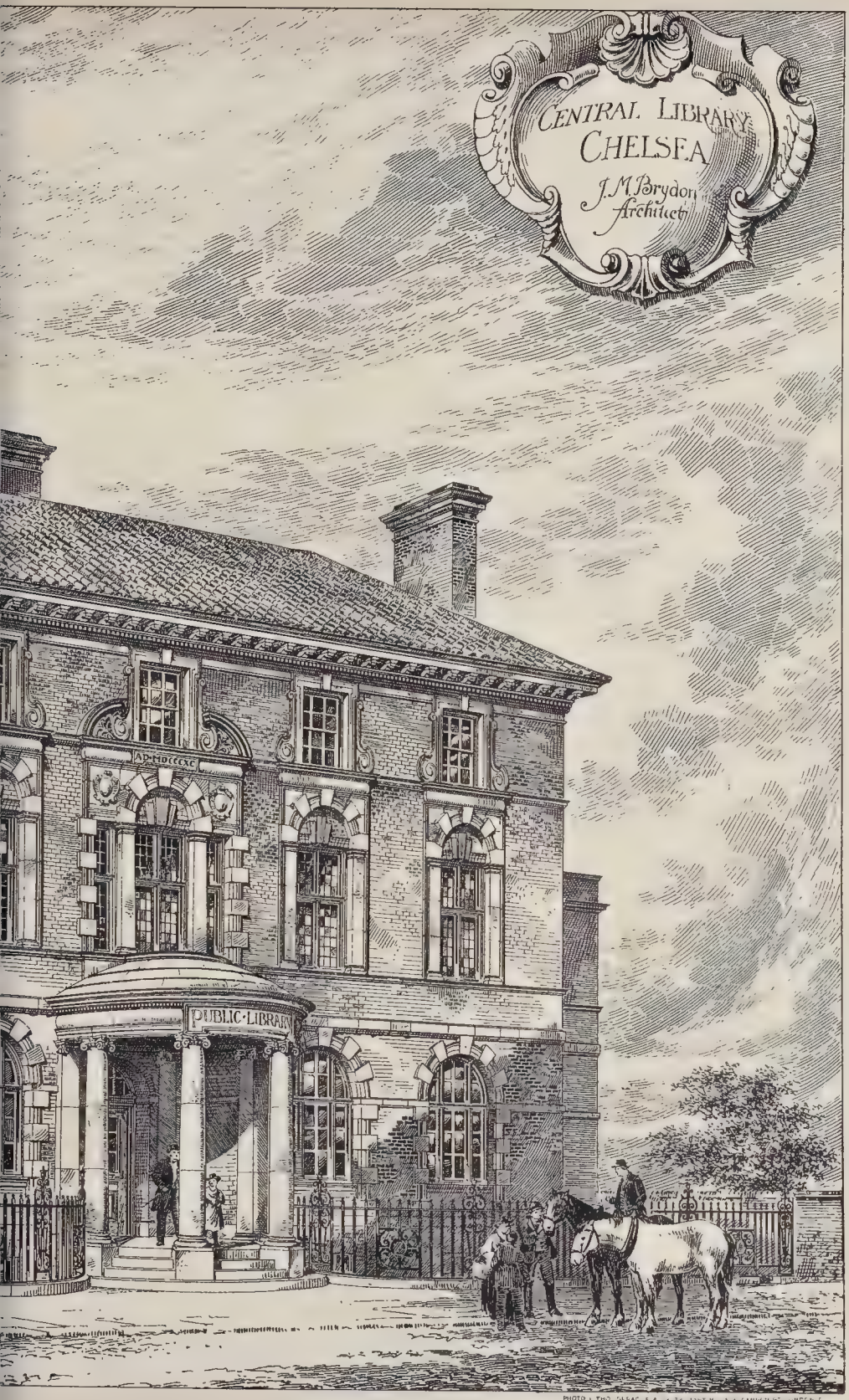
THE ordinary weekly meeting of the London County Council was held on Tuesday last, at Spring-gardens, Sir John Lubbock, the Chairman, presiding.

Appeals against Parish Assessments.—The Council, at its previous meeting, adopted the recommendations of the Local Government and Taxation Committee, that the Council should appeal to the Quarter Sessions against the totals of the valuation lists of the following parishes and unions—(*a*) St. George, Hanover-square; (*b*) Holborn Union; (*c*) St. Marylebone; (*d*) St. Giles-in-the-Fields and St. George, Bloomsbury; (*e*) Shoreditch; (*f*) Lambeth; (*g*) St. George-in-the-East; (*h*) Stepney Union; (*i*) Mile-end Old Town; (*j*) City of London Union; (*k*) St. Olave Union; (*l*) St. Saviour's Union. The Council at the same time, however, resolved to adjourn until the present meeting the question whether any of the appeals should be further proceeded with. The Committee recommended:—

"That the Council do appeal to the Quarter Sessions against the totals of the gross and rateable values inserted in the valuation list of the parish of St. George, Hanover-square; that the Solicitor be instructed to give notice of appeal accordingly; that the amounts of increase to be inserted in the notice be 235,097*l.* gross and 193,059*l.* rateable, and that we be authorised to retain counsel and witnesses, as may be necessary, subject to an estimate to be submitted to the Council by the Finance Committee in accordance with the statute, and that in the meantime we be also authorised to make the necessary deposit in lieu of entering into recognisances to prosecute the appeal."

Similar recommendations were contained in the report to the effect that the Council should appeal in the cases of Marylebone, St. Giles's


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and St. George's, Bloomsbury, St. Leonards' Shoreditch, Lambeth, St. George's-in-the-East, Stepney Union, and Mile End Old Town. These parishes, the Committee alleged, were under-assessed to the following amounts, viz.:—St. George, Hanover-square, 100,000*l.* gross, 82,000*l.* rateable; St. Giles and St. George, 10,000*l.* gross and 8,200*l.* rateable; Shoreditch, 7,495*l.* rateable; Lambeth, 26,433*l.* rateable; St. George's-in-the-East, 6,300*l.* rateable; Stepney, 3,254*l.* rateable; Mile End Old Town, 215*l.* rateable.

Mr. Boulnois, M.P., moved as an amendment:—

"That no further proceedings be taken in respect of the appeals at the present time, the Council not having sufficient or reliable information before it to justify the heavy expenditure (which would fall upon the rates) in prosecuting and in defending the appeals, and in furnishing professional evidence in the 5,448 cases and upwards suggested by the Committee; especially as in many of the same cases the Assessment Committees of the Metropolis have, in adjudicating, heard the ratepayers themselves as well as the Crown Surveyor of Taxes, and appeals to the Courts of Law have been open in ordinary course to the Crown and others interested; and further that, in taking the extreme course proposed, the Council would not be able equitably to adjust any increased taxation between the ratepayers of the parish affected, but the same would fall upon the ratepayers now assessed to the utmost limit, as well as upon those alleged to be under-rated."

This amendment, which was seconded by Alderman Debenham, was defeated, after a long discussion, by the large majority of 75 votes to 10. The recommendations of the Committee were then agreed to, the Committee undertaking to endeavour to come to some arrangement with the Assessment Committees of the various parishes concerned with a view to diminishing law-costs as far as possible.

The Bethnal-green Slum-Clearance Scheme.—A long and important report relating to this scheme was placed on the agenda by the Housing of the Working Classes Committee, but its consideration had to be postponed for want of time.

Highgate Archway.—The Report of the Highways Committees contained the following paragraph and recommendations:—

"We have again had before us the question of the desirability of widening Archway-road (one of the roads vested in the Council by the Local Government Act), and, as a necessary consequence, the reconstruction of the Highgate Archway under which the road passes. On October 28 last we reported to the Council that, after considering the provisions of the London Street Tramways (Extensions) Act, 1883, with reference to the proposed reconstruction of the archway, we had come to the conclusion that the responsibility with reference to the archway and the road over it devolved upon the Vestry of Islington, which had repeatedly urged the necessity for widening the road and reconstructing the archway, and the Hornsey Local Board; and the Council, on our recommendation, directed that the Vestry of Islington should be informed that the Council could not recognise it as any part of its duty to undertake the reconstruction of the archway, but that should the work be undertaken by the Vestry in conjunction with the Hornsey Local Board, any application for a contribution towards its proportion of the cost of the work would be duly considered. We have since had before us a further letter from the Vestry in which it is urged that as a consequence of the passing of the Local Government Act any responsibilities which formerly devolved upon the Vestry with reference to the road and the archway, were transferred to the Council; and upon further consideration we are inclined to think that there is some force in this contention. We have had an interview with the Clerk of the Vestry, who stated that the Vestry would be willing, should the Council undertake the widening of the road and the reconstruction of the archway in conjunction with the Middlesex County Council, to contribute half of the Council's proportion of the cost of the work, but was not prepared itself to move in the matter, as in its opinion the responsibility rested with the two County Councils concerned. There appears to be little doubt that the road needs to be widened; and having regard to the provisions of the London Street Tramways Act of 1883, above referred to, under which the Tramways Company is to pay 3,000*l.* towards the cost, and to the fact that the Vestry would probably contribute at least half the amount of the Council's share of the cost, we are of opinion that the Council might endeavour to ascertain whether the Middlesex County Council would be inclined to co-operate in the work. We therefore recommend—

'That the Middlesex County Council be asked whether it would be willing to enter into an arrangement with the London County Council for carrying out the work of widening Archway-road and of reconstructing the Archway.'

This was agreed to, and after the transaction of other business, the Council adjourned.

ARCHITECTURAL SOCIETIES.

CARDIFF ARCHITECTS' SOCIETY.—The annual general meeting of the Cardiff Architects' Society was held on the 14th inst., at the Park Hotel, Cardiff. Mr. E. Seward, F.R.I.B.A., presided, and there were present Messrs. Bruton, Halliday, Williams, Caple, Morgan, Vaughan, Snell, Taylor, Thomas, and Baldwin (hon. secretary). The proceedings of the society since its formation last Spring were reviewed, and several matters of professional interest were discussed. The statement of account, showing a good balance, was formally accepted, and the hon. secretary, who is also hon. treasurer, was re-elected for the year just begun. Six nominations of candidates for election were received. It was announced that Mr. Searles-Wood, F.R.I.B.A., of London, would read a paper before the society, dealing with an architectural tour in Italy, on the 30th inst. A paper on "Colour Decoration," by Mr. J. P. Seddon, F.R.I.B.A., will be read later on in the season. It was resolved to hold the society's annual dinner on the 29th inst., at the Park Hotel.

MANCHESTER ARCHITECTURAL ASSOCIATION.—The last ordinary meeting of this Association was held at the Athenæum on Tuesday last, Mr. T. Chadwick in the chair. A paper was read by Mr. R. Elsey Smith on "Some Typical Greek Buildings," illustrated by views with the oxyhydrogen lantern. A vote of thanks, proposed by Mr. Booth, seconded by Mr. Willoughby, and supported by Mr. Mould, concluded the meeting.

EDINBURGH ARCHITECTURAL ASSOCIATION. The usual fortnightly meeting of this Association was held on the 15th inst., the President, Mr. John Kinross, in the chair. Mr. H. Bellyse Baildon read a paper on "The Art Delight—its Rationale." According to the report in the *Scottish Leader*, the paper was based on the assumption that there is a special delight derivable from the contemplation of what is artistically represented, a delight distinct and separate from the contemplation of the same thing in actual existence. While it appeared nothing better than the assertion of a truism to say that the human mind rejoiced in the discovery and acceptance of the truth, it was also an incontrovertible fact that it was continually being involved in the coils and meshes of error, the seeming inconsistency of which facts was at once removed on our reflecting that we necessarily delighted in what we deem to be true, because of its seeming truth, although in reality it may not be true at all or only partially so. To truth, as truth, the mind inevitably inclines, and no error has been or can be accepted except through proclaiming itself as true. Nor did he think this statement invalidated by the fact that a truth may be painful and a delusion pleasing, for the delusion as soon as it is recognised as such loses its prevailing attraction, while the truth when established compels the mind towards it, in spite of its less attractive aspect. Such being the case it must strike all, he thought, with astonishment, that so massive and judicial a mind as Lessing's should have attributed the art delight to delusion—delusion in itself being never other than painful, and in addition to this might be cited the fact that the art which delights us does not delude us, while that which deludes us does not delight us—at least never in the same degree or manner as that which offers no real deception. A picture, a marble statue, or any such fine work of art never hesitates to avow its real nature, never pretends to be that which it represents. No one but a child or an imbecile ever supposes that the picture is anything other than a plain surface, the statue other than cold stone; and the moment the mind doubts either of these facts its pleasure is disturbed if not wholly destroyed. Proceeding to analyse more closely the elements in the art delight, the lecturer said that these fell under three main divisions—the first, the qualitative or intrinsic, which takes its rise in the nature of the thing represented, pleases us in proportion to the beauty of the object itself; second, the dynamic or technical, where the pleasure is derived rather from the excellence of the art and execution than from the nature of the object; and thirdly, the emotional or spiritual, which is dependent on the ideas expressed and suggested by the works of art. It was not, however, to be supposed that those classes of pleasure could often be found separate, or entirely dissociated from each other, and in all the very highest branches of art we should find all three in combination. At the same time, in all the art that fell short of being the very highest, we would find some defect which might be classified by means of these divisions. Mr. Baildon concluded by giving illustrations of his analysis of the Art Delight.

GLASGOW ARCHITECTURAL ASSOCIATION.—The members and friends of this Association, to the number of forty, met for supper in the Grand Hotel, Glasgow, on the 13th inst., the honorary president, Mr. John Jas. Burnet, F.S.A., presiding. The guests of the Association, as representative of various kindred societies or as lecturers for the current session were:—Mr. D. W. Stevenson, R.S.A.; Mr. William Leiper, P.I.A.; Mr. James Thomson, Pres. Archt. Section of the Philosophical Society; Mr. T. L. Watson, F.R.I.B.A.; Mr. Francis H. Newbury, headmaster, School of Art; and Mr. Wm. Paton Buchan, S.E. While assembling, an opportunity was given of examining members' work, as seen in pencil sketches, water-colours, and measured drawings of old work.

ARCHITECTURAL SECTION OF THE PHILOSOPHICAL SOCIETY, GLASGOW.—A meeting of the Architectural Section of the Philosophical Society was held on the 19th inst. in the rooms, Bath-street, Glasgow,—Mr. James Thomson presiding. Mr. Thomas Main read a paper on "Fireplace Construction." He described a fireplace so constructed as to give the maximum of heat with the minimum of fuel. There was no draught in the fireplace, and he claimed that it was smoke-consuming, kept a fresh room, made slow vents active, and stopped down-draughts. He also stated that $2\frac{1}{2}$d., by that fireplace, would heat a room containing 5,000 cubic feet of air for nine hours at a temperature of 60 degrees.

ARCHÆOLOGICAL SOCIETIES.

SHROPSHIRE ARCHÆOLOGICAL SOCIETY.—The annual meeting of this Society was held at Shrewsbury on the 17th inst. Mr. R. L. Kenyon presided. The Secretary, Mr. T. Goyne, read the report of the Council, which stated that the most important work which had been carried out during the year had been the excavation of the crypt of Old St. Chad's Church, which was now completed, and the whole of the interior exposed. It was proposed to make an entrance thereto from the street adjoining as soon as authority could be obtained. A proposal had also been made to the Antiquarian Society to undertake further excavations at the buried Roman city Uriconium near the town. The report was adopted, and the Council and officers were re-elected.

SOCIETY OF ANTIQUARIES OF SCOTLAND.—The second ordinary meeting of this Society for the present session was held on the 12th inst., Sir Herbert Eustace Maxwell, Bart., M.P., vice-president, in the chair. The first paper read was on a series of remains from certain ploughed lands, long buried under the sand dunes of Fendom, near Tain, Ross-shire. A paper by Mr. G. W. Constable gave an account of the excavation of the Harelaw Cairn, on the estate of Glencraig. In the last paper, Dr. Robert Munro, one of the secretaries of the Society, described a series of curiously-constructed objects of wood which have been found from time to time in peat-bogs in various parts of Europe, and are supposed to have been used as otter or beaver traps.

GLASGOW ARCHÆOLOGICAL SOCIETY.—The monthly meeting of the Glasgow Archæological Society was held on the 15th inst., at which Mr. A. M. Scott, F.S.A., read a paper on "The Semples of Cathcart;" and Mr. George Neilson gave a paper on "Peel, its meaning and derivation."

ROYAL SOCIETY OF ANTIQUARIES OF IRELAND.—The annual general meeting of this Society was held in Dublin on the 13th and 14th inst. The President, Lord James Wandesford Butler, was in the chair. Mr. Robert Cochrane, hon. sec., read the report of the Council for the year 1890, which stated that the number of new members elected in the year 1890 amounted to 275, the greatest number ever elected in any one year since the foundation of the Society. Two of the new members were subsequently elected Fellows, fifteen old members were advanced to the rank of Fellow, and seven Fellows were elected, making the total of Fellows elected during the year twenty-four. There are now 138 Fellows and 768 members, making together 906 names upon the roll of the Society. As a result, the financial condition of the Society is satisfactory. After the payment of all expenses of the year, a

balance remains to credit of £258. 2s. 6d. The Council have taken steps to reorganise the system of local secretaries, with a view to having a more efficient system than hitherto prevailed, for protecting and reporting upon objects of antiquarian interest. The Council had under consideration the advisability of preparing an index to the first twenty volumes of the "Journal" (1849-89). They came to the conclusion that a trial should be made by indexing the first five volumes, and that, with the experience thus gained, an estimate of the time and cost of completing the index could be arrived at. The experiment of indexing the first five volumes, so far as the preparation of the MS. index goes, has been undertaken free of all cost to the society. As an extra volume for the year 1890, the Council have decided upon publishing "The Book of Accounts of the Monastery of the Holy Trinity; or, Christ Church, Dublin," edited by Mr. James Mills, from the original document preserved in the Public Record Office. This work is now in the press. The question of the proper housing of the society's museum in Kilkenny, and the best method of rendering it available for exhibition, has occupied the attention of the Council for some time, and is still under consideration. In connexion with the museum the want of a catalogue has been much felt. Mr. J. G. Robertson, the late hon. curator, under whose directions the many interesting objects were brought together, has kindly undertaken to prepare a catalogue. The excavations of Kilelton old church, county Kerry, have proceeded under the direction of the hon. provincial secretary for North Munster, who has furnished an interesting report on the broken crosses, and the oblong and circular chambers found in the tumulus adjoining the primitive sixth-century cell. At Kilmallock the work of securing the beautiful window of the southern transept of the fine Dominican abbey is now being brought to a close under the supervision of the hon. provincial secretary for South Munster.

"It was fortunate the society was permitted to commence operations, as from the extremely dangerous condition into which the whole gable had fallen it could hardly have survived this winter, and this magnificent window, with its beautiful net tracery, would have been destroyed. The White Knight's tomb in the choir will be railed in to keep off cattle. The whole cost of this work is borne by voluntary subscriptions, paid to the society for the purpose, including a contribution voted by the society out of their funds."

The report was unanimously adopted. Papers were read "On the Water Supply of Ancient Dublin," by Mr. H. F. Berry; on "On Ogham Inscriptions found at Kinataloon, co. Cork," by Canon Edmond Barry; and on "House-keeping in Mediæval Dublin," by Mr. James Mills. The second day was spent by the members in the New Science and Art Museum.

OBITUARY.

MR. W. E. BARTLETT.—On the 16th inst., at Stoke, the death occurred of Mr. W. E. Bartlett, who occupied the post of Borough Surveyor to the Devonport Corporation from 1843 until about seven or eight years ago, when failing health caused him to retire. Unable to grant him a pension, the Council (according to the *Western Morning News*) marked their appreciation of his services by making him their consulting engineer, and this office he held up to the time of his death. As the son of a Devonport builder, Mr. Bartlett's practical experience was most valuable to him, and under his direction schemes for the drainage of the town were carried through. He took much interest in sanitary improvements, and his activity and hard work during the cholera epidemic were recognised by a vote of thanks from the Corporation, accompanied by an honorarium.

MR. ANTHONY PAYTON, C.E.—The death is announced of Mr. Anthony Payton, C.E., who for many years filled the position of inspector of the permanent way for the Cuesterfield district on the Midland Railway.

A MOSAIC PAVEMENT FROM BROKEN CROCKERY.—We have had an opportunity of seeing, at the offices of Messrs. Jeremiah Lyon & Co., Lombard-court, what claims to be a new kind of mosaic pavement. The material of the tesseræ consists simply of broken crockery, potsherds, or pottery waste, divided into small pieces and set in Portland cement. Although each of the tesseræ has a glazed surface, the pavement affords a very good foothold, for no attempt is made to rub it down to an absolutely level surface as in marble mosaic pavements. It is stated that any required colour can be obtained. This method of utilising what is now practically a waste material seems to be capable of good results artistically, and appears to be worth attention.

Correspondence.

To the Editor of THE BUILDER.

DRYDEN'S HOUSE.

SIR,—After Homer's death an endless number of towns claimed the honour of his birthplace, although when living they cared very little for his company. Dryden was not very much better used; but as there is competition among the public and an eagerness to define his residence in Fetter-lane, I beg to put in my claim, as on the house, No. 17A (now demolished), was a tablet with this inscription: "Here lived John Dryden, the poet, B. 1631, D. 1700. Glorious John."

The house belonged to a client of mine, who disposed of it to the City Sewers Commission; and before demolition I took a sketch of it, which I forward for publication, if you think well.

T. E. KNIGHTLEY.



House in Fetter-lane, now demolished: formerly claimed as Dryden's.

ST. SEPULCHRE'S CHURCH, LONDON.

SIR,—In your notice of the above church in the *Builder* of December 27, I was glad to read that the churchwardens are about to restore the tombstone of Captain John Smith. The old dark blue slab, thought to be his memorial, having three Turks or negroes' heads upon it, I had taken great care of during the carrying out of the works in the church, as described on the first page of my paper on the restoration of church in 1880; and I may mention that both Dean Stanley and Canon Farrar were much interested about its preservation, writing to me and visiting the church twice upon finding it, and inspecting it where it was laid.

Much has been said and written about the several repairs to the church, and more especially the one immediately after the Great Fire of 1666, and that the church was then almost entirely rebuilt by Sir Christopher Wren. I was kindly allowed by the churchwardens some fifteen years ago to examine the old Minute Books of the Vestry, commencing at the time of the Great Fire, in 1666, when I made (amongst other very interesting matters) a transcript of their resolutions; stating the several works of repair to the church that were carried out by their orders, —giving the names of each master of the several trades, and amounts paid by them. To my mind it appears distinctly under the direction of the vicar and churchwardens only, being commenced in 1667 and completed in 1670, and not under the direction of Sir Christopher Wren. I have thought it well to send my pamphlet describing the several alterations and restorations, giving you the details of the various works, showing there was no rebuilding by Wren; indeed, the whole of the old walls remain, with the window-jambs and arches almost perfect, as in 1450; only the mouldings and stones calcined in places by the fire in 1666, which have been since reinstated. You will, I think, upon perusal of the same, consider the documentary statements contained in the ancient minute-books as the best historical evidence to be obtained upon the subject.

I would not have troubled you with these few lines did I not feel that the statement that Sir Christopher Wren restored the church, having been repeated in various papers, cannot really be substantiated as correct history, and therefore should not be allowed to go unchallenged.

ARTHUR BILLING, F.R.I.B.A.

VENTILATORS TO SOIL-PIPES.

SIR,—In the tenth paragraph of Mr. Buchan's letter which appeared in your last issue he says, "Now, I do not at present believe that they had any such idea or object until after the letter from me which appeared on page 372 of the *Builder* for Nov. 8 last."

This unwarranted remark he applies to a statement in my letter published in your issue of the 10th inst., which was, "that the object which I and Mr. Simmance always had in view is to ventilate soil-pipes by means of a continuous current of fresh air always moving in the same direction, in a manner to prevent sewer-gas from getting into the soil-pipe."

I think that, taking into consideration the fact that neither myself nor Mr. Simmance are personally known to Mr. Buchan, the recklessness with which he impugns our veracity is an index of his utter disregard for anyone but himself.

It is impossible for him to conceive that any common-sense idea could by any means occur to anybody except to Mr. W. P. Buchan, and therefore he unhesitatingly stamps our statements as unworthy of belief.

Now, with regard to the drawing which appears on page 94 of the *Builder*, illustrating our idea of the ventilation of soil-pipes by a current of air moving always in the same direction, Mr. Buchan says "it so happens that this is the system illustrated by fig. 22 in my patent of 1883," and of which fig. 6 in his letter is a skeleton sketch "showing the air and water both going in the same direction."

A careful examination of these drawings will demonstrate the fact that these differ materially from each other. In his drawing there is an open grating above the sewer trap, not perceptible on a cursory examination, on account of the smallness of the scale, which will make the practical working of his plan very different to that shown by the arrows. Therefore, whilst my drawing shows a simple and practicable application of an idea which does work well in any weather, Mr. Buchan's small skeleton sketch shows an undecided system not at all like ours, and which will not work well. He says he has sometimes carried this cut in practice. Has he not in so doing jeopardised the health of his clients?

In the matter of the two drawings his statements are, therefore, misleading. Why did he not put in an enlarged drawing, so that the details might have been distinctly seen without the aid of a magnifying glass?

After this sample of Mr. Buchan's method of argument, it is hardly worth while to refer to his ill-natured remark, "that my drawing was designed by a person having a very superficial knowledge of

plumbers' work," excepting that on page 222 of his book on plumbing, referred to in his letter, *he shows branch air-pipes precisely similar to those in my drawing*, and does not condemn them.

In the system illustrated in my drawing, the air pipes may be separate or connected together in one pipe, according to the circumstances which rule the case.

Notwithstanding that we have never recommended the use of our ventilator on the *top* of a soil pipe, Mr. Buchan still persists, for the purposes of carrying on an unfair argument, in saying that we do. I protest against this further attempt to mislead your readers.

After having endeavoured to understand the fifteen claims and seventy-three somewhat vague sketches in Mr. Buchan's patent of 1878—wondering all the time how he ever induced the Patent Office to grant him so many different patents and outlines of patents for one fee—I have found fig. 4, which is not like my cowl, but cannot find fig. 5 as shown in his letter. This fig. 5 is nearest in outline to my patent cowl; but there the resemblance ends, excepting when it has a hinged valve, which Mr. Buchan knows, having our patents before him, I do not claim, because it is notoriously public property. The hinged valve was used by Arnott and others long before the date of Mr. Buchan's patent, and, therefore, should be omitted from his list of public benefactions.

Nevertheless, when I use a hinged-valve, the hinge of my valve differs from Arnott's and all others in being made of steatite, a very smooth, hard, mineral substance, which when finished is harder than the hardest steel, and perfectly incorrodible, and, therefore, not liable to get out of order.

In conclusion, I beg to say that the experiments on which I found my statements of the utility of our inventions are not made in a room with the aid of a bit of candle, but in the open air, in all kinds of weather, and under practical working conditions.

I am at all times ready to show any of your readers who are interested in ventilation the practical working of our cowls, and to permit them to make trials of them. WILLIAM SUGG.

SIR,—In my letter on p. 51, thirteenth line from top, there is a small mistake, viz.,—"figs. 1 and 2 below" should read "figs. 2 and 3 below." The references are all right immediately after, but it may be better to rectify this. W. P. BUCHAN.

*** The mistake was not ours.—ED.

The Student's Column.

VENTILATION AND WARMING.—IV.

AVOIDANCE OF DRAUGHT.

AS it is hardly possible to obtain the ideal current of air mentioned in our last chapter, we should endeavour, in order to avoid draught, to reach as close an approximation thereto as possible, and we should, therefore, as our first precaution, break up our current of air to the fullest possible extent by sub-dividing our openings, both inlets and outlets, to the highest practicable degree. The inlets, especially, we should reduce to an individual area of at least one foot superficial, while half this area would, usually, be far better.

We have taken it for granted, that in our ventilation, we have both inlets and outlets, for, at this time of day, we need hardly suppose that any student would imagine that either can be dispensed with, or that if openings are provided for the exit of the foul air, the fresh air will find its way in somehow. With a sufficiently strong aspirating cause drawing out the foul air, it is undoubtedly true that there will be an influx of air from somewhere coming in somehow, whether through imperfectly fitting doors and windows, or through the more or less porous walls, ceilings, and floors. But these channels then form the inlets that we require, and it is in the highest degree probable, that these self-constituted inlets will give evidence of their existence by the manifestation of draught.

Nor is it desirable to rely upon one opening, or one series of openings, acting as both inlet and outlet. Such an action is particularly favourable to the development of draught, and there is also the high probability, amounting almost to certainty, that the incoming fresh air will mingle with and bring back with it some of the foul air we are anxious to get rid of.

Both inlets and outlets, then, we must have, and it is desirable, in order that our ventilation should be thorough, that these be so placed that the current of air shall traverse the whole of the apartment. Only in this way can we hope to sweep out not only the gaseous impurities but also those that are, as we have seen, far more difficult to deal with,—the organic impurities and added water vapour.

In dealing with natural ventilation, there is especially a dangerous probability of draught, for as the current of air depends, as we have seen, upon difference of air pressure, produced usually either by difference of temperature or by wind; and as these phenomena of nature are not capable of regulation by us, it will frequently happen that the intended direction of the current will be reversed—the outlets will act as inlets and *vice versâ*. Hence it is important to avoid the probability of this as far as possible, and also to make such provision that when the reversal of current does occur the evil effects may be minimised.

Accordingly, the position of both inlets and outlets should be so arranged that there may not be a certainty of some of either class of openings operating more strongly than their fellows. If, for example, the inlets are arranged some on one side of a room, some on the opposite, so that one set is exposed at times to considerable wind pressure, while the other is warmed by the sun, it will be almost certain that, the outlets being assumed to be actuated by natural causes only, the former set of inlets will act as inlets, but the latter as outlets. This will probably upset the action of some at least of the intended outlets, and there will be through them a certain amount of down draught.

It must, therefore, be remembered that all the inlets should be, as far as possible, exposed to similar air-pressure and temperature; and so also, even in a greater degree, with the outlets.

Again, to preserve equality of action in the outlets, it is important that any flues or air-ducts for the removal of the vitiated air should, in natural ventilation, be of the same height, or the longer ones will have a tendency to a quicker current than the shorter, and may consequently overpower them.

The area of the outlets should never be greater than that of the inlets; it is preferable, rather, that the converse condition should exist, though it is inadvisable that there should be much excess of inlet, as this generally contributes to irregularity of current.

Outlets should especially be protected from reduction of temperature; rain and snow should be unable to penetrate to their internal surface, and the wind should not be allowed to blow down any outlet tube, hence the open-mouthed tube, although effectual when the wind is in a favourable direction, requires protection from downward current.

The outlets should also be as straight as possible, and with smooth surfaces to any tubes or ducts so as to maintain as effective an action as possible, for we are still considering the avoidance of draught with natural ventilation, in which, it must ever be remembered, that the currents are usually feeble, and frequently extremely so.

Having taken every possible precaution to prevent reversal of current we must still, in any application of natural ventilation, expect that, in spite of all our precautions, a greater or less reversal of current will occasionally occur. No cowl or other apparatus depending for its motive-power wholly on the wind can be trusted to be universally free from down draught. "Self-acting" ventilators are liable to down draught in two opposite conditions of wind-pressure, in calm and in storm. At a low wind-pressure, and with the resulting feeble current, the aspirating power of the "self-acting" ventilator is liable to be overpowered by a superior strength of current. On the other hand, with a strong gusty wind, the current is at times particularly powerful and the internal atmosphere rarefied thereby, then may follow a sudden drop of the wind and the outlet relieved from the aspiration becomes an inlet.

To meet the danger of down draught, manufacturers are now introducing valves in connexion with "self-acting" upcast ventilators, of which those made by Sugg & Co. are a good example. Of necessity, these valves must be extremely sensitive in action, and are therefore especially prone to the possibility that affects all valves,—the liability to get out of order. We must therefore make such provision that when a reversal of current does occur, the result may be as innocuous as possible; hence it is advisable to break up the current of the down draught, and to deflect its course, so that it may not impinge directly upon the occupants of the room.

Inasmuch as with natural ventilation a varying strength of current is inevitable, the openings should be of sufficient extent to avoid a too rapid current, that is one of greater velocity than 2 ft. per second, when the motive-power is at its highest efficiency. Thus, when the activity of the wind or other motive agent decreases, our current will be still further removed from a dangerous velocity, and we shall always be on the safe side.

It is advisable to protect the inlets, as a rule, from the direct action of the wind, as if freely exposed, it is practically certain that at times the current will be unbearably rapid.

By reason of the varying rate of current it is somewhat difficult to satisfactorily arrange means of heating the incoming air. If, however, this is attempted the provision must, in order to be effectual, be sufficient to warm the air of the most rapid current. As it will then possibly be too much for a feeble current, it will follow that, to be satisfactory, the heating power should admit of ready reduction. When adequate provision for warming the incoming air has, however, been made, there still remains the necessity for careful and constant supervision and attendance.

This, however, we cannot always depend upon, and it is therefore advisable to arrange the inlets so that if the incoming air is not of the right temperature, or is too rapid in current, the stream should not impinge upon the persons of those in the room.

Inlets for natural ventilation should, therefore, be at least 5 ft. above the floor level, and with an upward direction. The air stream should be subdivided as much as possible, hence wire gauze or perforated metal are useful. In using these, however, care must be taken that the clear opening is in excess of the area of the duct leading to them. Indeed, generally, it is well that inlets should expand towards their delivering orifice, as this assists the diffusion of the fresh air and tends to prevent draught.

The ventilation openings should, as a matter of expediency, be capable of being closed at will by easily-worked valves, so that when the evils of natural ventilation become unbearable they may be obviated by an abandonment of the ventilation. Indeed, as a rule, so perverse is human nature, that people will readily endure a draught which they could easily shut out, when, if it were beyond control, the whole ventilation scheme would be condemned and extinguished.

Accordingly, if we employ natural ventilation, we should, after taking every possible precaution to avoid draught, provide for the temporary suspension of ventilation when our precautions fail, or appear to do so.

GENERAL BUILDING NEWS.

ST. STEPHEN'S CHURCH SCHOOLS, CANONBURY, N.—The new schools attached to St. Stephen's Church were opened by the Bishop of Bedford (Dr. Billing) on the 2nd inst. The new rooms consist, on the ground floor, of a boys' school, 30 ft. by 26 ft., and a class-room, 21 ft. by 16 ft., and a girls' school and class-room on the first floor to correspond. The rooms on the first floor are arranged to be used in connexion with the present school as one room, so as to be available for concerts and other parochial entertainments. The opening between new and old schools on the ground floor is provided with revolving shutters, supplied by Messrs. Francis & Co., so as to form two rooms when required. The upper rooms have open-framed roofs. The walls of the main schools are plastered above the dado level, and those of the class-rooms are faced with stock bricks. Boarded dados, 3 ft. 6in. high, are provided to all rooms, and the woodwork throughout is stained and varnished. Brown salt glazed bricks have been used for fireplace openings, and Shorland's Manchester grates. Messrs. McCormick & Sons, of Canonbury-road, were the builders; and Mr. Arthur Ardron, of Southampton-street, Bloomsbury, is the architect. The site upon which the schools are built was a gift from the Marquis of Northampton.

CHAPEL BUILDING, THROCKLEY.—On the 17th inst. the foundation-stones of a new Primitive Methodist Chapel were laid at Throckley, Northumberland. The site of the new building is at the east end of the village, and Mr. Jos. Shields, architect, of Sunderland, has prepared plans for a building to seat 150 persons, at a cost of about 300*l*.

NEW PUBLIC HALL FOR LIVERPOOL.—A former proposal for providing a Public Hall at Liverpool having fallen through, a new scheme has just been adopted, and Messrs. Ware & Rathbone, architects, Liverpool, are engaged in preparing plans. The site of the new building is in Myrtle-street. The ground floor of the new hall will be used as a large club, or rather clubs, and a portion will be devoted to women, and another to men. It is also proposed to include a drawing-room in this part of the scheme.

Over the ground floor there will be two principal concert-rooms—one, which is to be provided with a large organ and properly arranged orchestral platform, and will accommodate 2,000 auditors, while the other will be calculated to seat 400. A number of committee-rooms are included in the plans.

ARTISANS' DWELLINGS, DUBLIN.—The old and dilapidated buildings at Crampton Quay, Dublin, having been removed, artisans' dwellings, the building of which is now almost completed, are being erected on the site. The new structure forms the three sides of a rectangle which face Crampton Quay, Bedford-row, and Temple Bar. The buildings will be divided into two main divisions. The basement will be composed entirely of shops, having no connexion whatever with the two stories overhead, which are to be parcelled out into sixty-eight artisans' dwellings. The roofing of the shops is to be composed of concrete supported by iron work. The frontage of the new structure is of the following dimensions:—Crampton Quay, 140 ft.; Bedford-row, 120 ft.; and Temple Bar, 135 ft. All the shops will, in addition to the front entrances, have entrances from the rear. The entrance to the dwellings will be from the interior of the rectangle, by means of stairs reaching to two balconies, which will extend right round the building. Each dwelling will be complete in itself and entirely separated from every other. The work is being carried out by Messrs. J. & W. Beckett, South Dock Works, Dublin, under the superintendence of Mr. Ashworth, architect to the Artisans' Dwellings Company.

VICTORIA HALL, QUEENSBURY.—On the 17th inst., the Victoria Hall, Queensbury, built and presented to the inhabitants of Queensbury, Yorkshire, by Messrs. Foster & Sons, was formally opened by Mr. A. B. Foster. The hall is situated at Sandbeds, and the main front faces the Halifax road. The chief entrance is on the south front, and gives access to the public hall, reading-room, and library on the ground floor, and to smoking and recreation rooms and science lecture-room on the first floor. A shallow portico with coupled columns admits to the vestibule, which contains in side niches the marble busts of Mr. John Foster, the founder of the firm, and of Mr. William Foster. The busts have been carved by Mr. J. Nelson MacLean. The vestibule is of irregular shape, and is lighted chiefly by a large window on the stair landing, filled with stained glass by Messrs. Powell, of Leeds. The stair is of stone, and the floor of the hall, &c., is of mosaic. The main hall has a total length of 80 ft., with a width of 39 ft., and will provide about 600 sittings. There is a semi-circular orchestra and raised platforms at one end. Dressing and retiring rooms are attached. At the opposite end of the hall is a gallery. The roof of the hall is open to the collar, the ceiling being boarded and panelled; the woodwork is of pitch pine, dressed and unstained. The hall is lighted by gas pendants and wrought-iron brackets, the ventilation being effected by open panels in the ceiling. The reading-room is lighted by a large mullioned bay window, opening into the room by a semi-circular arch. The library is fitted up in pitch pine. The science lecture-room is situated above the reading-room, and has a panelled ceiling, and is lighted by a arched-headed mullion window. In a wing at the side of the main hall is the swimming-bath, lighted from the roof and by a large gable window. The bath is constructed of white glazed brick, and one side and end of the room are occupied by open dressing-boxes. In the basement in connexion with the baths are the washing and drying rooms. In a lower chamber are placed the Berryman heaters and circulating pumps for the baths. These are worked by exhaust steam conveyed from the Black Dike Mills, the heating of the whole building being effected by their means. Beneath the main hall is a dining-room, and in connexion with it a kitchen. The style of the building is "Queen Anne." The exterior is of local stone, the front being of fine-dressed wallstones, with ashlar dressings. A tower rises above the main entrance and is surmounted by a stone lantern. The carving has been executed by Mr. R. Boys, of Bradford. The work has been executed by Messrs. Foster's workmen, under the superintendence of the firm's clerk of works, Mr. Jonathan Jowett. The architects are Messrs. T. H. and F. Healey, of Bradford.

CHAPEL RESTORATION, CIRENCESTER.—The old Presbyterian, now the Unitarian Free Christian, Church, in Dollar-street, Cirencester, has just been re-opened, after restoration. The architectural characteristics of the building are of the late Tudor style. The old galleries have been practically removed, and the irregular tub seats, with the old paving, have been taken away and replaced by oak wood block in aisles and boarded joists beneath sittings, supplied by Mr. R. L. Lowe, of Farnworth. The floor has a ventilated space beneath, and 6 in. of concrete lies under the whole building. The building has a new roof, the internal soffit of which is panelled. The walls have been plastered with cement. The new roof is carried by four pairs of principals, and the side walls have been raised 2 ft. to receive it. A new top window has been added on the north side, and one of the south windows, which was formerly obscured by the gallery, has been restored. A window in the east wall has had to be built up. The seating is by means of red deal benches. The hot-water heating apparatus has been supplied by Messrs. Cock & Bartholomew, of Cirencester. The outbuildings have been restored, and a new drainage system has been introduced. The works have been carried out by Mr. William Newcombe, of Cirencester, from the designs and under the superintendence of Mr. T. Locke Worthington. The cost of the restoration will be about 800*l*.

PROPOSED NEW POLICE BUILDINGS AT SOUTH SHIELDS.—On the 14th inst., Col. C. H. Luard, R.E., a Local Government Board Inspector, attended at the Town Hall, South Shields, and held an inquiry in reference to the application of the Corporation for consent to borrow 17,000*l*. for the purchase of land and the erection thereon of police buildings and a fire brigade station. The Commissioner, accompanied by members and officials of the Corporation, having made an inspection of the site of the proposed buildings, said, in his opinion, the Ogle-terrace site was one of the very best sites he had ever seen. The Town Clerk having thanked the Commissioner for the manner in which he had conducted the inquiry, the proceedings concluded.

CATHEDRAL APPROACH IMPROVEMENT, GLOUCESTER.—The first general meeting of the shareholders in the Gloucester Cathedral Approaches Company, Limited, was held on the 17th inst., Mr. A. Knowles presiding. In moving the adoption of the Directors' report, the Chairman said the way was now clear for going on with the College-street improvement. A tender had been accepted for clearing the ground, and when that was completed they would be better able to say what class of buildings they would erect. There was still a large sum required to complete the whole of the buildings. It was estimated they required 9,000*l*. The report was adopted.

NEW BANK AT BLACKPOOL.—The contract for the new bank at Blackpool for the Preston Banking Company has been let to Mr. T. H. Smith, builder and contractor, of Blackpool, his estimate being 4,800*l*. The architects for the work are Messrs. Maxwell & Tuke, of Manchester.

HOTEL, ST. ANNE'S-ON-THE-SEA.—The contract for alterations to dining-room and lavatories of the St. Anne's Hotel, St. Anne's-on-the-Sea, has been let to Messrs. Walmersley & Smith, builders and contractors, of St. Anne's-on-the-Sea, their estimate being 801*l*. The architects for the work are Messrs. Maxwell & Tuke, of Manchester.

NEW BATHS, BATLEY.—We are informed that Mr. Walter Hanstock, A.R.I.B.A., has received instructions from the Batley Corporation to prepare plans for public baths, consisting of two swimming-baths, thirty slipper-baths, Turkish and vapour baths, &c., and a house for the manager.

SANITARY AND ENGINEERING NEWS.

HOUGHTON-LE-SPRING SEWAGE DISPOSAL—DURHAM.—The Houghton-le-Spring Local Board of Health, having agreed to adopt a scheme of sewage disposal, consulted Mr. D. Balfour, M.Inst.C.E., of Newcastle-on-Tyne. He prepared plans accordingly, showing the process of purification to consist in first mixing the sewage in large tanks (in duplicate) with alumino-ferric, a cheap chemical, which is stated to contain 46·7 per cent. of sulphate of alumina, and which is suspended in iron baskets or cages immersed in the sewage, to admit of the necessary proportion being dissolved to effect precipitation, and which, it is asserted, does not, like a large number of chemicals, require any machinery, nor add any bulk to the sludge, being entirely soluble in water, nor is it liable, being a neutral salt, to re-fermentation. The clarified sewage is then passed on to ten acres of land laid out for intermittent land filtration, the plan adopted consisting in forming the land into half-acre beds, broad-ridged, and furrowed, and which are used in regular rotation. These beds have special under-drainage, with ventilation shafts, into which the effluent will pass, so it is asserted, in a colourless, tasteless, and inodorous state. As sufficient suitable land could not be obtained, this chemical precipitation process was conjoined with the limited land for the purpose of chemically precipitating the solid matter as much as possible before applying the sewage to the land. Various succulent crops are grown on the ridges, the sewage filling the furrows. The scheme has just been approved by the Local Government Board.

SEWERAGE AND WATER SUPPLY, STROUD.—The Stroud Board of Health decided on the 7th inst. to apply immediately for power to borrow 3,000*l*. to improve the water-supply of the town, and 5,000*l*. to extend the drainage system and improve the present lengths of sewerage.

SEWERAGE OF ASH-NEAR-SANDWICH, KENT.—The sewerage of this village has long been in an unsatisfactory condition, and several proposals have been made as to the best method of dealing with it, none of which have found favour, and the last application to the Local Government Board for a loan to carry out the works proposed was refused. A fresh application having been made for a loan of 4,000*l*. for carrying out the works, Mr. Arnold Taylor, one of the inspectors of the Local Government Board, held an inquiry at Ash-near-Sandwich, on the 20th of November last, when a complete scheme for the sewerage of the place was submitted by Mr. Charles H. Beloe, C.E., comprising a system of sewers, conveying all the sewage o the place to one spot, where it is proposed to treat it in accordance with the system of the International Water and Sewage Purification Company, Limited. The sewage is first led into tanks, and there treated with the precipitant and deodorant supplied by the company, called ferozone, and then filtered through polarite filter-beds. The inquiry was attended by a large number of people. On January 7, Mr. Frederick S. Cloke, the Clerk to the Sanitary Authority, received the sanction of the Local Government Board to the proposed loan, and it is hoped that the works will be proceeded with without any further delay.

THE SANITARY INSTITUTE.—In connexion with this Institute, the eleventh course of lectures and demonstrations for sanitary officers is announced. The lectures and demonstrations have been arranged for the special instruction of those desirous of obtaining knowledge of the duties of sanitary officers. The various subjects will be dealt with in a course of sixteen lectures, given by well-known authorities, and will be illustrated with diagrams, drawings, and models. These lectures are a continuation of the courses previously held by the Parkes Museum, and it is proposed to repeat the course twice each year, to suit the requirements of persons preparing for the examinations of the institute. The lectures will comprise the subjects scheduled for these examinations. The course will also, it is hoped, be useful in supplying the wants of acting inspectors and of other persons desirous of obtaining a practical knowledge of sanitary requirements and regulations. At the close of each lecture, students will be allowed to ask questions upon the subjects treated. The lectures will be given on Tuesdays and Fridays at 8 p.m., in the Parkes Museum, 74a, Margaret-street, W., and students attending the course will be granted free admission to the museum and library during February and March. A fee of 1*l*. 1s. will be charged for the course, to cover the necessary expenses, but inspectors or surveyors holding office, and candidates for the examinations of the institute, will be admitted at half fees. Further particulars may be had of the Secretary of the Institute, 74a, Margaret-street, W.

PROPOSED NEW SEWERAGE WORKS FOR EASTBOURNE. On the 8th inst., at the Eastbourne Town Hall, Mr. J. Thornhill Harrison, Local Government Inspector, held an inquiry into the application of the Council to spend 25,000*l*. on a system of surface water disposal. The scheme has been devised by Mr. G. A. Wallis, M.I.C.E., and Mr. H. M. Whitley, C.E., with the assistance of the Borough Surveyor (Mr. Charles Tomes). In 1865 a sewer outfall was carried from Eastbourne to Langney Point, a distance of three miles, at the cost of the Duke of Devonshire. The Shone Ejector system was adopted in 1880, and has been since in operation. During the past twenty-five years the death-rate has averaged only 13 per 1,000. To prevent the flooding of the low-lying parts of the town, it is now proposed to construct thirty-eight large tanks. Into these the storm water will flow, and it will be utilised for flushing the sewers. The Town Clerk (Mr. H. W. Fovargue) stated at the inquiry that the ejectors had worked exceedingly satisfactorily for the past nine or ten years, and the Council intended to provide further ejector power. Evidence was given by Mr. Wallis, who stated that the population of Eastbourne was now estimated at 36,000. He also mentioned that he had successfully used the tank-system for storing surface water for flushing purposes at Hailsham. Mr. H. M. Whitley and Mr. Shone (Shone & Ault) also gave evidence. The Inspector will report to the Local Government Board in due course.

WIRKSWORTH WATERWORKS.—Mr. W. H. Radford, C.E., has prepared a scheme for obtaining an increased supply of water at Wirksworth. The town is now supplied by gravitation from springs issuing from out of the Millstone Grit. There is a large surplus during the winter, but the springs run very low, and there is consequently a scarcity for about three months in the summer. As there is no additional supply available within a reasonable distance, it is proposed to construct an open stone-built reservoir to hold three million gallons, in order that the winter's surplus may be stored for summer's use. A special meeting of the Local Board has been called to consider the scheme.

ELECTRIC LIGHTING OF WYNYARD.—One of the largest private house electric light installations in England will be that at Wynyard, Lord Londonderry's country seat in Durham. This installation, the contract for which has recently been given to Messrs. Drake & Gorham, will comprise 753 incandescent lamps, together with a steam-power electric generating plant of the necessary large dimensions. Mr. A. A. Campbell Swinton has been appointed consulting engineer to superintend the work on Lord Londonderry's behalf.

THE EXCEL GRINDING MILL.—Messrs. Leachman & Co. send us a diagram and description of this mill (Breakell's patent), for crushing ores, Portland cement, emery, &c. The crushers are of cast steel, and operate on the inner superfices of a steel cylinder, being driven by a cam-wheel working on a central axle within them. The mill is compact and entirely self-contained; total weight 22 cwts.

FOREIGN AND COLONIAL.

FRANCE.—By an order of the Minister of Public Instruction and Fine Arts, M. Antonin Mercié has been commissioned to execute the monument which is to be erected in the Panthéon to the memory of the generals of the French Revolution. M. Chapu, in the same monument, will execute the portion referring to the orators and statesmen of the same period.——M. Puvis de Chavannes has been commissioned by the Government to execute the cartoons for two tapestries to represent the Youth of Joan of Arc at Domrémy.——The Municipal Council of Paris has voted 50,000 francs for the representation of the city administration at the Moscow Exhibition.——M. Jules Lefebvre has been elected an associate member of the Academy of Antwerp, in place of the late M. Robert-Fleury. ——M. Cordounier has just executed a restoration of the statue known as the "Victory of Samothrace:" it has been cast in bronze by MM. Bapst and Falize.——The third exhibition of the "Union des Femmes Peintres et Sculpteurs" will be opened in February 21. The "Société des Artistes Indépendants" will open their seventh annual exhibition at the Ville de Paris Pavilion in March or April. ——M. Laisne, architect, and member of the "Commission des Monuments Historiques," has died, at the age of 72.——The town of Toulon (Var) has demanded from the Government the demolition of its fortifications in order to allow of the further extension of the town. M. de Freycinet, the Minister of War, has informed the municipality that it is impossible to grant their request.——The celebrated Palais de Justice at Rouen, which is one of the principal archæological curiosities of that city, has been seriously injured by a fire which was not extinguished without great difficulty. The wing of the palace in which the fire broke out was rebuilt in 1882, under the direction of the architect Lefort. Fortunately the fire did not touch the Salle des pas Perdus, the decoration of which dates from 1508.——The Abbé Duichard, curé of Pupillin (Jura), has discovered in the course of some excavations in that neighbourhood a fine bronze antique statue of Jupiter.——At Pau there is in preparation what will prove a very interesting retrospective exhibition, which is to include objects of art belonging to the Basses Pyrénées, as also of Landes, Gers, and the Hautes Pyrénées."——There is some question of removing Baillé's statue of Voltaire which stands on the Quai Malaquais, and which is too high in relation to the Palace of the Institut close by. It is proposed to replace it by one of d'Alembert, which would be put up to competition. If this proposal is adopted the statue of Voltaire will be re-erected to the left of the Panthéon, as a pendant to Berthet's statue of Rousseau.

BERLIN.—The municipal authorities of the city have voted 100,000 marks towards the International Art Exhibition to be opened in May. The work of adapting the exhibition halls in the "Landes Ausstellungspark" for hanging purposes has been commenced.——In honour of Professor Karl Becker's seventieth birthday an exhibition of this artist's paintings has been opened.— —The Schliemann collections, which are at present to be seen in the "Museum für Völkerkunde," are to have room found for them in the proposed Classical Museum, about to be erected, according to the designs of Prof. F. Wolff, on the so-called Museum Isle.——The newly-organised architectural society, "Vereinigung Berliner Architekten" (the greater part of the members of which were formerly active workers in the older institute, "Architekten-verein zu Berlin"), held its first ordinary meeting on January 7. Among the members of this new society we find many names of leading architects. President for the year is Herr von der Hude; vice-president, Reg.-Bm. March; hon. sec., Dr. Gurlitt; committee members, Messrs. Boeckmann, Ende, Fritsch, Kayser, Kühn, Orth, Raschdorff, and Schmieden. The Society is to be practical rather than artistic in its aims. Over 100 members have already joined.——The new hospital buildings of the clinical department of Professor Koch's new institute are progressing rapidly, three of the "barracks" already being under roof. In spite of the intense cold, the works are being carried on night and day, without regard to expense.——Workmen's dwellings are to be erected in Berlin on the Peabody system at several central points in the city. The scheme, based on private enterprise, was intended to be carried out on a large scale. Financial difficulties have delayed it for the moment.——On account of the frequent dishonest dealing by jerry-builders and speculators, a meeting of the representatives of the building trades, &c., has been held for the purpose of deciding on means to ensure against loss. Besides a system of cash prepayment, a mutual insurance scheme was proposed.——The Berlin telephone communication, which is under Government control, has increased rapidly, some 150,000 subscribers being now attached to the system. The laying of some 200,000 mètres of wire underground has cost about 2,000,000 marks.

INFORMATION FOR EMIGRANTS.—In a circular issued from the Emigrants' Information Office, 31, Broadway, Westminster, S.W., it is stated that the January circulars, the penny and other handbooks, with maps, issued by the Office show the present prospects of emigration to the Colonies and one or two foreign countries. A *résumé* is hung up in every post-office in England, Ireland and Scotland, so that intending emigrants have no difficulty in obtaining information. There is no demand in Canada for men during the winter; emigrants should not arrive before April, when there is likely to be a demand for farm hands, carpenters, masons, and others in the building trade; female servants are always in demand. The chief demand in Australasia is for female servants, farmers, miners, navvies, farm hands, dairymen, ploughmen, gardeners other than fancy flower gardeners, bushmen, general labourers, and men who are well up in working land, pruning fruit-trees, shearing, and nursery work. There is no demand for mechanics in Queensland, South Australia, or New Zealand, and but little in the other Australasian Colonies, though the general strike is now over; but a good workman will always find employment. In South Africa, carpenters, masons, bricklayers, and other useful mechanics, navvies, farmers, men accustomed to work on the land, and female servants are in demand in Cape Colony and Natal, and may under certain conditions obtain reduced passages there. Clerks, shopmen, warehousemen, and women above the grade of servants are warned against emigrating to any of the Colonies, unless they go to situations already prepared for them.

SWITZERLAND.—The proposed National Museum, the decree for the formation and erection of which was passed by the Bundesrath last summer, is to be at Zurich –this city being considered by the authorities to be more suitable than Bern or Lucerne. The municipality of Zürich, expecting that their city would be selected, have had a preliminary design for the building made by M. Gustav Gull, and issued a photo-lithograph of the design as soon as the decision in favour of their city became known. The site chosen for the new museum buildings is on the Platz promenade. M. Gull's design shows a very picturesque block of buildings grouped round a large quadrangle. There will be 6,000 square mètres available for exhibiting purposes.——The municipal authorities of Lucerne are to have a monumental town-hall, with offices, on the Falkenplatz. The preliminary competition for designs, opened last summer, has been decided, the first prize (1,000 francs) falling to M. Meili-Wapf, of Lucerne, and the second to M. Emil Vogt, of Milan. Ten designs were submitted to the jury.

AUSTRIA.—We hear that an electric railway, between Pest and Budapest, is being planned, and that the preliminary concession has been granted by the Government.——A new bridge over the Danube has been thrown open at Pressburg. The bridge will be used for railway, carriage, and foot passenger traffic. The central span is 88 mètres wide, the side spans, 72 mètres.—*Deutsche Bauz.*

CHILI.—The new railway line between Concepcion and Lota was opened on January 1. A bridge of 1,889 mètres length (the longest in South America), resting on sixty-three piers, is on this line.——The provisionary railway bridges over the rivers Laja and Rio are being replaced by iron ones, the erection of which is in the hands of an English firm at Valparaiso.

NEW RUSSIAN CANAL AND PORT.—A company has been formed in Russia, with a capital of 100 million francs for the purpose of cutting through the Isthmus of Perekop, and thereby establishing direct connexion by sea between the Black Sea and the south-western basin of the great bay (the Azow Sea). The length of the canal is estimated at 110 versts. The breadth at the bottom will be 70 ft., and the depth 20 ft. It is to be finished in six years. A new port is also to be constructed in the Kola Peninsula, between the Arctic and the White Seas, and close to the Norwegian frontier, at a cost of 800,000 roubles.

CORFU.—The Empress of Austria is having a magnificent palace built at Corfu, in its own grounds, which are beautifully situated on the seashore. The palace, a three-story building with 128 rooms (with exterior façades of Romanesque type and interior decoration on Pompeian lines), has been designed by the Neapolitan architect, Signor Rafaele Charito, under whose superintendence the grounds have also been laid out. These grounds, having a superficial area of some 89,000 sq. mètres, enclosed by a garden wall of Ferarra marble, have been specially adapted for horticulture, and already show a collection of no less than 25,000 stocks of roses. The blocks of buildings for stables, servants' quarters, &c., are all planned on a large scale. It may be well to state that the lighting throughout the buildings and grounds is by electricity, and that a lighthouse placed on the head of the miniature harbour at the lower end of the grounds gives a light of 12,000 candles. Commenced in 1889, for an estimated cost of some 3,000,000 francs, the work is expected to be finished this spring.

THE INSTITUTION OF CIVIL ENGINEERS.—At the last meeting of the Institution of Civil Engineers, the Council announced that they had transferred Mr. W. Santo Crimp, Associate-Member, to the class of Member.

MISCELLANEOUS.

THE REGISTRATION OF PLUMBERS. -The London Registration Committee, acting in conjunction with the Worshipful Company of Plumbers, held its annual meeting on the 15th inst. The Master of the Company (Mr. W. H. Bishop), who presided, congratulated the Committee on the fact that the number of plumbers registered during the past year showed a considerable increase over the numbers for previous years. As evidence of the efficiency of their work, he mentioned that during the whole time the Committee had been in existence not a single authenticated case of wrong-doing on the part of a registered plumber had been brought before the Court. The number of members of the Metropolitan Committee was not large, but there were upwards of eight hundred members in the various registration committees acting in conjunction with the Company throughout the country. Referring to the question of the technical education of plumbers, he said that it was a question which had been discussed at numerous public meetings held in various parts of Great Britain and Ireland, and the Plumbers' Company had reason to believe that the requisite funds would shortly be forthcoming to enable them to give practical effect to the educational scheme which they had prepared, in conjunction with a number of prominent educationists. At one of the public meetings referred to, Dr. Alfred Hill, Medical Officer for Birmingham, had said:—"It was no use having good sanitary arrangements and sanitary inspectors unless the plumbing work was well done. The Health Committee wanted really to make the plumbers their technical assistants." It was hoped and believed that one result of the educational scheme he had referred to would be to meet this want. –Mr. Alderman Knill (Past Master) paid a warm tribute to the honorary examiners, upon whose ability, energy, and strict impartiality the success of the registration movement, he said, so largely depended.—Sir Philip Magnus referred to the very large increase in the attendance at the plumbing classes, and stated that there were now about 1,300 students in these classes throughout the United Kingdom. He directly attributed this increase to the efforts of the Plumbers' Company in connexion with the National System of Training and Registration of Plumbers. — Several examiners, including Mr. John Smeaton (master plumber, member of the Court of the Company), Mr. W. Titmas (master plumber), and Mr. R. A. Nurse (United Operative Plumbers' Association of Great Britain and Ireland) stated that they had found that many of the plumbers who came up for examination had no idea how to set about their work properly, because they had never received the requisite technical instruction. Mr. C. T. Millis (Director of Technical Classes at the Finsbury Technical College and the St. Stephen's Technical Institute, Westminster), and Mr. J. Browning (operative plumber), were amongst the other speakers.

JERRY-BUILDING IN BOMBAY.—On the 17th Dec., a five-storied dwelling-house in Bombay collapsed without warning, whereby twenty-nine of its inmates were killed, and nearly forty badly injured. At an adjourned inquest, Mr. Rienzi Walton, Executive Engineer to the Municipality, said he had examined the *débris* and most of the timberwork was old stuff. The bricks were of inferior quality, but the mortar adhering to the bricks was for the most part good. The structure was a frame building with the spaces filled in with masonry. The house was constructed in accordance with the by-laws framed under the Municipal Act of 1878. Under this Act there was absolutely no authority to enforce any dimensions with regard to timber, walls, height, or any matter relating to structure. The Building Department of the Municipality has for years appended to its building forms a schedule of dimensions which are deemed to be essential for the stability of buildings. There is no authority to enforce them and they are limited merely to suggestions. A local contemporary remarks that, in its opinion,—"Whatever the Coroner's inquiry may reveal as to the construction and material of the building which collapsed without warning yesterday morning, the moral responsibility for the catastrophe rests ultimately with the Corporation."—*Indian Engineer.*

A REMARKABLE THEFT.—On awaking the other morning the dwellers in the Allée Verte, in Brussels, were surprised to find that the paving-stones in the roadway for some 300 yards had entirely disappeared. The stones, over 10,000 in number, had been broken out and carted away in the night, the police on duty in the avenue refraining from interfering with the thieves in the belief that they were municipal paviors at work. Neither the thieves nor the paving-stones have been discovered.

THE PANAMA CANAL.—A correspondent, writing from Panama, states that the work executed for the canal is gradually being obliterated. There are now hardly any traces of the excavations, whilst the valuable machinery is fast rusting away, and will soon be worthless.

THE CLERKS OF WORKS' ASSOCIATION OF GREAT BRITAIN.—The eighth annual dinner of this Association will take place at the Holborn Restaurant on Monday, February 9, Mr. Charles Barry, F.R.I.B.A., F.S.A., in the chair.

CONTRACTS AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Fire-clay Retorts, Fire-bricks, Clay, &c. for Gasworks	Bowarby Bridge L. B.	J. Marsland	Jan. 27
Cemetery Improvement Works, Aberlour, N.B.	Major M'Gowan	.....	do.
Copper Plates, Boiler Tubes, Steelwork, &c. for Bridges	India Office	*Official*	do.
*Roadmaking Works	Vestry of St. Mary Abbotts, Kensington	do.	do.
Cutting Track and Laying Pipes, Bothwell Waterworks	Committee of Middle Ward of Lanark	J. & A. Leslie & Reid	do.
Pipe Sewers, with Manholes, &c.	Ashby-de-la-Zouch RSA	J. W. Metcalf	do.
Two Dwelling houses, Stabling, &c. Doncaster	Burtonstaw & Tovey	.....	do
Timber (deal-ends)	Southampton Union	*Official*	do.
*Road Materials, Oil	Bexley Local Board	E. Reeve Boulter	Jan. 28
*Roadmaking and Paving Works	Hammersmith Vestry	H. Mair, C.E.	do.
Meter House, Kennedy's Meter, Fittings, &c.	Castleford Local Board	*Official*	do.
Brickwork, &c., and Iron Gates and Gate Posts, Campfield	Manchester Corp.	do.	do.
Gas-pipe Railing, with Cast-iron Standards, &c.	Salford Corporation	do.	do.
Alteration of Central Market	do	do.	Jan. 29
Furnishing, Fitting, &c. New Council Chamber, Guildhall, York	York Corporation	G. S. Doughty	do.
*Works and Materials (one year)	Chelsea Vestry	T. W. E. Higgens	do.
Cast-iron Gutters, Pipes, &c.	Indian Midland R. Co.	*Official*	do.
Additions to School	Llangeinor Sch. Bd.	G. F. Lambert	Jan. 31
Laying Water Mains (7 miles) with Meter Chambers, &c.	Wakefield U.R.S.A.	F. Massie	do.
New Wing to Residence, Sestan	Mr. Wilkes	E. H. Harbottle	do.
Vertical Engine and Boiler, Parc Gwyllt near Bridgend	Glamorgan County Asylum	*Official*	do.
*Paving Works	Farnham Local Board	R. F. Hankins	Feb. 2
*Alterations to Lavatories, &c.	St Mary (Newington) Vestry	*Official*	do.
*Erection of Lodge	Battersea Burial Bd.	do.	do.
Ironwork for Carriages Wheels, Axles, &c.	Bombay, Baroda, and Cent. India Ry. Co	da.	do.
*Day and Jobbing Works to Sewers, &c.	Paddington Vestry	da.	do.
*Broken Granite	do.	do.	do.
*Granite Kerb, York Paving, and Granite Cubes	do.	do.	do.
Extension of Municipal Buildings	Nelson (Lancashire) Corporation	T. A. Crowther	do.
*Tar-paving Works, Grand Parade	Eastbourne Twn Coun.	C. Tomes	do.
*Works and Repairs to Sewers, Drains, &c.	Limehouse Bd. of Wks.	*Official*	do.
*Sewers Work, High-street, Poplar	London County Council	do.	Feb. 3
*Sewers Work, The Grove, Hammersmith	do.	do.	do
*Widening Timber Jetty at Barking Outfall Works	do.	do.	do.
New Post Office, Paisley	Com. of H.M Wks, &c.	do.	do.
*Works and Materials	Westminster Vestry	G. R. W. Wheeler	do.
*Roadmaking Works	Tottenham Local Bd.	J. E. Worth	do.
*Cast iron Water-pipes	Brampton U.R.S.A.	J. Reay	Feb. 4

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer	Tenders to be delivered.
*Road Materials	Hull Corporation	*Official*	Feb. 4
*Works and Materials (one year)	Hampstead Vestry	C. H. Lowe	do.
Cast-iron Water-pipes and Valves	Port Elizbeth (Cape Colony) Town Coun.	J. Wolfe Barry	Feb. 6
*Battery and Drill Shed, Greenock	Admiralty	*Official*	do.
New Infant School and Walls, Duffrown	Moritach School Board	Geo. Sutherland	do.
Villa Residence, Dalhousie, Inverarry, N.B.	Jas. Wyllie	.....	Feb. 7
Enlargement of Christ Church, Hadham, Bridel	The Vicar	.....	do.
*Supply of Road Materials	Com. of H.M. Wks, &c.	*Official*	Feb. 9
*New Hospital, North Heigham	Norwich Corporation	P. P. Marshall	Feb. 10
*Works and Materials	Battersea Vestry	J T Pilditch	do.
*Agricultural Drainage	London County Council	*Official*	do.
*Building a Weir, &c. &c.	do.	do.	do.
*Alterations and Additions to Boiler-house	do.	do.	do.
Three Semi-detached Villas, Holywell Green, Halifax	.....	C. F. L. Horsfall & Son	Feb. 12
*Brick Chimney Shaft	Smith & Grace	Smith & Grace	do.
*Re-erection of Stabling	Lewisham Union	*Official*	do.
Ironwork, Carriage Fittings, &c.	Belfast and Northern Counties Ry. Co.	*Official*	Feb. 13
*New Municipal Buildings	Sheffield Corporation	G. W. Mountford	Feb. 17
*Erection of Infant School	Loughton School Board	J. Cubitt	No date
Excavating Block of Property, Hunslet-road, Leeds	Wm. Greenwood	.....	do.
Twelve Houses, Bombay and Madras-streets, Leeds	.....	Albert Dixon	do.
Detached Villa, Gledhow	C. Howson	J. Hall & Sons	do.
Eleven Houses, Holbeck, Leeds	.....	Buckton & Ch	do.
New Premises, South Shields	E. Moncrieff & Son	J. W. Donald	do.
New Offices, Cattle Market, Northampton	Northampton Corp.	*Official*	do.
*Constructing Road, Halstead	War Department	do.	do.
*New Buildings, Sheerness-on-Sea	.....	W. M. L. Seaman	do.
New Shop, Show-room, Work-room, &c.	Doncaster Corporation	H. Athron	do.
New Schools, Esh Colliery, Durham	Pease & Partners	Clark & Moscrop	do.
Residence, Broomfield, Ireland	Mr. Petticrew	Young & Mackenzie	do.
Additions and Alterations to "Nether-hall," Maryport	.....	C. J Ferguson	do.
Bridge at Langley Burn, Newcastle	Longtown Highway Bd.	R. Maxwell	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Manual Trainer	Central London Dist. School, Hanwell	2*l.*	Jan. 20
*Inspector of Water Fittings	Tottenham Local Bd.	2*l.* 2*s.* weekly	Jan. 31
*Inspector of Nuisances	Hanley Corporation	104*l.*	Feb. 3
*Six Superintendents of Main Roads, Bridges, and Buildings	Governmt of Jamaica	200*l.*	Feb. 10
*Tap Examiner	Weymouth Waterwks	Not stated	No date

Those marked with an Asterisk (*) are advertised in this Number. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xviii. *and* xix.

THE CARPENTERS' COMPANY.—A course of free lectures on matters connected with building will be delivered at Carpenters' Hall, London Wall, on the following Wednesday evenings, at eight o'clock p.m., viz.:—February 11, Prof. H. Robinson, M.Inst.C.E., on "Sanitary and Insanitary Dwellings;" Sir John Coode, K.C.M.G., in the chair. February 18, Professor T. Roger Smith, F.R.I.B.A., on "Failure of Buildings;" Mr. A. Waterhouse, R.A., F.R.I.B.A., in the chair. February 25, Prof. J. W. Groves, F.L.S., on "Timber: its Growth and Decay;" Sir J. C. Lawrence, Bart., in the chair. March 4, Prof. J. M. Thomson, F.C.S., F.R.S.E., on "Chemistry of Building Materials, with Experiments;" Mr. C. Barry, F.S.A., F.R.I.B.A., in the chair. March 11, Mr. Thomas Blashill, F.R.I.B.A., on "The Carpenter as House-builder, with Illustrations;" the Rev. Henry Wace, D.D., in the chair. March 18, Prof. Banister Fletcher, F.R.I.B.A., on "Architecture, and its Civil and Commercial Value;" the Right Hon. Sir J. Lubbock in the chair. Cards giving full particulars can be obtained at the Hall and at all the large builders'; also of the Secretaries of the Royal Institute of British Architects, and the Architectural Association, 9, Conduit-street, W.C.; at the Architectural Museum, Tufton-street, Westminster; and at the Working Men's Club and Institute Union, 150, Holborn, E.C.——At a recent meeting of the Court of the Worshipful Company of Carpenters, a vote of 50 guineas was made to the Irish Distress Fund. Subscriptions were passed for the current year to the undermentioned Institutions, viz.:—City and Guilds' Institute, 500*l.*; Builders' Benevolent Institution, 26*l.* 5*s.*; London Hospital, 70*l.*; to the Great Northern, King's College, Ophthalmic, Royal Free, and Charing-cross Hospitals, 10*l.* 10*s.* each. To the National Lifeboat Institution, Royal Blind Pension Society, City of London Truss Society, Hospital for Incurables, Reedham Asylum, School for Indigent Blind, Asylum for Idiots, London Orphan Asylum, Watford Strangers' Friend Society, Scripture Readers' Association, 10*l.* 10*s.* To the Stratford, West Ham, and Essex Dispensaries, All Saints' Convalescent Home, Eastbourne; Bexhill Convalescent Home, Hospital for Diseases of the Skin, Mr. Wardell's Convalescent Home for Scarlet Fever, Children's Convalescent Home, Hastings; National Benevolent Institution, United Beneficent Society, Hospital for Paralysed and Epileptic, Merchant Seamen's Orphan Asylum, Railway Institution, and the Charity Organization Society, 5*l.* 5*s.* each.

LONDON AND FOG AND SMOKE.—Mr. Assiter writes to say that his remarks on this subject quoted in our last were not in the form of a paper read at the meeting referred to, but remarks in seconding a vote of thanks. The *resumé* sent to us conveyed the impression of being a report of three successive papers. We did not print the *resumé* of the principal paper by Mr. R. Macintyre, because it went on the assumption that London fog is caused by London smoke and can be stopped by smoke legislation, which is an assumption entirely contrary to facts, and therefore arguments based on it are of no value.

IMPROVEMENTS AT BELFAST.—From the office of the City Surveyor of Belfast (Mr. J. C. Bretland) we have received a return of the principal works executed in his department during the year 1890. They include, besides a large quantity of new paving and flagging, and renewals and repairs of old paving, the widening and improvement of a great many streets. The works embodied in Contract No. 1, under the Main Drainage Act, have not as yet been finished, owing to unexpected delay, but it is expected that they will shortly be completed. Contract No. 2, which includes the construction of the high-level intercepting sewer, as far as Divis-street, has been in progress during the year, and is expected to be finished early in the spring. The tunnelled work has all been executed. Contract No. 3, which comprises the erection of the Duncrue-street pumping-station, is being rapidly pushed forward, and the engines and boilers are being constructed. Contract No. 4, for the construction of the low-level intercepting sewer along Duncrue-street, is also in progress. In view of the Reclamation Embankment in Contract No. 1 being shortly closed in, the contract drawings for the storage reservoir and auxiliary pumping-station are being prepared. The new Albert Bridge has been opened to the public, and two granite approach walls at each side of the bridge on the County Down side of the river are being proceeded with. The New Quay wall along the River Lagan, between the Queen's Bridge and the Great Northern Railway Bridge, is still in progress, and is expected to be shortly finished. The new covered market has been completed, the fittings made, and the market opened for public use. The site of Dunville Park has been taken over, the buildings thereon removed, and ornamental gates and railings for enclosing the park are being erected. Several other improvements of a minor nature have been made in the various parks. The number of buildings of which plans were approved in the year 1889 was: County Antrim side, 1,489; County Down side, 761; total, 2,250. The number of buildings of which plans were approved in the year 1890 was: Country Antrim side, 1,739; County Down side, 1,216; total, 2,955. The area of the city is 6,805 acres; the number of streets is 1,700; and their total length is 150 miles. The total valuation of the city on January 1 last was 688,826*l.* The total valuation on January 1, 1862, was 279,067*l.*, showing an increased valuation in twenty-nine years of 409,738*l.* During the same period (twenty-nine years) there were 37,044 new buildings erected in Belfast.

FOY, MORGAN, & CO.'S ANNUAL WOOD REPORT, 1890.—Messrs. Foy, Morgan, & Co., in their annual report, say:—"The past year has been an unfortunate one for the wood trade, inasmuch as prices had a downward tendency from January to October, and importers, as a rule, have done badly in consequence. The drop on f.o.b. prices since the early months of the year has been fully 20 per cent., notwithstanding that freights have been moderate and consumption very good. Many of the shippers, who were too sanguine to accept the really capital figures current in January and February, were compelled in August and September to take nearly 25 per cent. less on the common qualities and low-priced goods, and the *sauve qui peut* which took place had a most damaging effect on both the London and the coast markets. The outlook now is certainly healthy, as buyers willingly offer a considerable advance on the lowest figures current in the autumn. With the wonderful consumption which has been going on stocks are already within reasonable bounds. If an enormous quantity of cheap goods had not been most unwisely forced on the London market, and the financial panic in October had not taken place, there is little room for doubt that the market would have been much firmer and prices considerably higher than they now read. Should the f.o.b. prices for 1891 be moderate, and the element of speculation be judiciously checked, it seems likely that the season will open with brighter prospects for importers than has been the case for several years. Failures have not been numerous, and the trade has proved itself far sounder than many would have supposed after the rough times it has lately undergone." The report then proceeds to give in great detail the statistics of the year's trade.

THE DANGERS OF PORTABLE STOVES.—The dangers of portable-stoves have been curiously illustrated in Copenhagen. One morning the inhabitants of second, third, and fourth stories in a building were found partly suffocated, and were restored with difficulty. No smell or smoke could be noticed, nor had any fire been lighted for some days in the grates of either story. However, on the first floor there was a portable-stove alight for some days, and to this the fumes were traced, although the residents there felt no ill-effects. This is thus explained. The chimney into which the flue had been run being situated in an exposed part of the building, and there having been no fires for some time, was exceedingly cold, and the gases from the stove being unable to warm it, and thereby create a draught, they had been forced down the chimneys into the other stories.

PHILIP'S MAP HOLDER.—Messrs. Philip & Son send us a description and illustration of what they term their "Signal Map Holder," in which a certain number of large-scale maps for general use are mounted on rollers which are hinged to an upright wooden standard which forms a folding case for them. The maps are displayed by raising and extending the rod bearing the rollers at right angles to the standard case, like a railway semaphore; when not in use the maps are all rolled up to the rods, which drop into the standard, and only show a pillar-shaped case standing on the floor. The arrangement is both neat and convenient.

THE ENGLISH IRON TRADE.—If anything, there has been a relapse in the English iron market, which continues rather quiet, without, however, prices being seriously affected. The Glasgow warrant market has been inanimate, but warrants have been tolerably steady. Cleveland pig-iron has been forced down 6d. a ton by buyers, who purchase but sparingly, with makers holding back, believing, as they do, with some show of reason, that values will recover with the advent of the Spring trade. Shipments are at present small, owing to the continuance of the severe weather and the reserve of foreign consumers. Hematite pig is quieter, with an easier tone. Business in finished iron and steel is moderate, but manufacturers have a fair amount of work in hand. Little can be said respecting the shipbuilding trade, excepting that new orders are scarce. The condition of the engineering branches of industry is fairly satisfactory.—*Iron.*

MEETINGS.

SATURDAY, JANUARY 24.

Royal Institution.—Mr. W. Martin Conway, M.A., F.S.A., on "Pre-Greek Schools of Art." I. 3 p.m.

MONDAY, JANUARY 26.

University College (Archæology).—Mr. W. St. Chad Boscawen on "Babylonian Archæology and Art." II. 5 p.m.

Society of Arts (Cantor Lectures).—Mr. A. J. Hipkins, F.S.A., on "The Construction and Capabilities of Musical Instruments." I. 8 p.m.

Leeds and Yorkshire Architectural Society.—Sketching Club Evening. Exhibition of sketches, casts, &c. 7.30 p.m.

TUESDAY, JANUARY 27.

Society of Arts (Applied Art Section).—Mr. William Simpson on "Lithography: A Finished Chapter of Illustrative Art." 8 p.m.

Institution of Civil Engineers.—Mr. J. F. Spencer on "Machine Stoking." 8 p.m.

WEDNESDAY, JANUARY 28.

South Kensington Museum (Lecture Theatre).—Mr. Maurice Hewlett on "The Rise of the Renaissance in England." IV. 3.45 p.m.

Society of Arts.—Mr. Carmichael Thomas on "Illustrated Journalism." 8 p.m.

THURSDAY, JANUARY 29.

Institution of Mechanical Engineers.—Annual General Meeting. 7.30 p.m.

Society for the Encouragement of the Fine Arts.—Mr. P. H. Newman on "The Chronology of Costume." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Edinburgh Architectural Association.—Mr. T. F. Binnie on "Are Architects and Builders Adversely Affected by the Present System of Feu-Duties and Taxation." 8 p.m.

FRIDAY, JANUARY 30.

Institution of Mechanical Engineers.—Annual General Meeting (continued). 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Sir Douglas Galton, F.R.S., on "Ventilation, Warming, and Lighting." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. E. L. Hill on "The Counterbalancing of Locomotive Engines." 7.30 p.m.

SATURDAY, JANUARY 31.

Royal Institution.—Mr. W. Martin Conway, M.A., F.S.A., on "Pre-Greek Schools of Art." II. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

20,528.—WINDOW SASH "SILENCER": *E. H. Young.*—The apparatus which is the subject of this patent is made and fixed so as to act as a strut, separating the two sashes, while simultaneously forcing the top sash against the outer bead, and the bottom sash against the inner bead. The appliance itself is made hinged in the centre, and while one part is screwed on the top rail of the lower sash, the other is forced against the centre bar of the window.

1,678.—FIRE GRATES: *C. M. Sansom.*—According to this invention, a block or plate of fire clay is supported over the fire and projects upward at an acute angle towards the front of the grate. This plate retains the heat, radiates it, and economises fuel.

1,729.—WATER METER: *J. Merrill.*—This appliance is to be used where a cistern or other vessel discharges a known quantity of water at varying intervals. A float is attached to a rod or lever working upon a joint-pin arranged to work in conjunction with and to operate a train of wheels communicating with pointers which register the figures on dials each time the lever is raised and lowered, thereby indicating the quantity of water used.

1,900.—ROOF-COVERING: *J. & A. Drexler* (Vienna).—The covering which is the subject of this patent is formed of sheet metal-plates, so fixed to the lathing as to present a corner at top, the attaching to the roof being performed by a strip of sheet-metal inserted under a flap formed at the upper corner of the plate, and folding against the front surface of the same. Narrow marginal strips along the edges of the upper half of the polygonal sheet metal-plate are folded against the upper side, and similarly the edges of the lower half are folded against the lower side, the corners of the plates being first cut so as to prevent over-lapping.

2,371 and 2,371a.—BRICKS, AND SUBSTITUTE FOR FIRE CLAY: *C. H. Edwards.*—In the first specification the utilisation of waste sand from glass works, and in the second the use of sea sand and ordinary sand for brick-making is described. Both processes are similar. "Pit arrants," or the clay shale found in local pits, are ound with sand and water to bind the whole together. he mixture is then made into bricks and burned. The icks must be well burned.

17,853.—GLUE COMPOUND: *T. O. Butler.*—According this specification, common glue, Paris white, and sulphur are mixed together through the medium of water and heat, and form a compound having great tenacity, and useful for light woods by reason of its whiteness.

NEW APPLICATIONS FOR PATENTS.

January 5.—169, N. Dennys, Anti-Fouling Paint for Submerged Surfaces of Wood, &c.

January 6.—221, J. Parr, Scraping and Cleaning Chimneys, Chimney-pots, and Flues.—231, J. Lloyd, Glaziers' Diamonds.—238, W. Sescombe, Brick-burning Kilns.—277, A. Lees, Curing Smoky Chimneys, &c.

January 7.—291, T. Potter, Combined Fire-resisting Concrete Floors and Ceilings.—292, D. Knowles and E. Raybone, Sash-fasteners.—312, F. Holloway and E. Bastin, Tie-Bricks.

January 8.—355, H. Dent, Brickmaking Machinery.

January 9.—401, S. Adams, Sanitary Closets.—417, W. Williams, Hanging Window-sashes.—418, J. Armitage, Sign-boards, &c.—431, W. Perkins, Mitreing or Bevilling Machines for Wood-working.—462, A. Binnie, Stoves and Fireplaces.

January 10.—473, A. Spurrier, Fireplaces.—509, W. Munns, Windows.—524. T. Hayton, Paving-slabs, &c.—529, F. Schluchtner, Speaking-tubes.—535, G. Wise, Condensation-channel for Glazed Sashes. &c.—537, E. Brown, Door-handle Fastenings.

PROVISIONAL SPECIFICATIONS ACCEPTED.

16,305, A. Ross, Water Cisterns, &c.—18,787, W. Calway, Ventilation of Houses, and of Roofs of same.—19,249, J. Winterflood, Ventilating Geysers.—19,306, T. Switzer, Mitreing Mouldings.—19,594, G. Boisselier, Preparing Mosaic and other Slabs, Tiles, &c.—19,871, W. Bryan, Water-waste Preventer.—20,118, A. Downie, Planing-machines.—20,229, F. Chopping, Windows, Fanlights, and Doors.—20,559, W. Moncrieff, Water-waste Preventing Cistern.—20,661, J. McGlashan, Ventilating and Chimney-cowls.—20,739, J. Bayly, Flushing Apparatus.—20,799, J. Bayly, Brick-kiln.—20,814, T. Clarke, Chimney Pots.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

1,755, A. Tomkins, Portable Slow Combustion Stoves.—3,657, R. Morris, Door Checks. -5,310, A. Sharp, Roofing with Slates with or without Putty.—17,503, J. Bayly, Drying Clay Products and other Materials.—17,795, F. Oschwald, Building Material.—19,645, R. Gardner, Sash Balances. -19,953, R. Bohme, Serrated Stones or Bricks for Floors, Sills, Ceilings, &c.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

DECEMBER 22.—By *Weatherall & Green:* F.g.r. of 21*l.* 5*s.*, with reversion in 93 yrs., Wandsworth, 400*l.*; f.g.r. of 21*l.* 5*s.*, with reversion in 93 yrs., 400*l.*

JANUARY 12.—By *Weatherall & Green:* 1 and 4, Catharine-ter., Kensington, u.t. 13 yrs., g.r. 6*l.* 9*s.*, r. 65*l.*, 305*l.*

JANUARY 13.—By *Rogers, Chapman, & Thomas:* 6, St. George's-sq., Belgravia, u.t. 40 yrs., g.r. 13*l.*, 750*l.*

JANUARY 14.—By *Lound & Howitt:* "The Manbey Arms," and a plot of land, f., Stratford, 3,350*l.*; 21, Water-lane, f., r. 22*l.*, 320*l.*

JANUARY 15.—By *Reynolds & Eason:* 20 and 22, Coronet-st., Hoxton, f., r. 65*l.*, 500*l.*: 25, Baches-st., u.t. 37 yrs., g.r. 45*l.*, 360*l.* By *Newbon & Harding:* 82, St. Peter-st., Islington, f., r. 40*l.*, 540*l.*; 20, Shrubland-grove, Dalston, r. 30*l.*, and l.g.r. of 10*l.*, u.t. 51 yrs., 290*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	15	0	7	5	0
Teak, E.I. ....load	10	0	0	18	0	0
Sequoia, U.S. ....foot cube	0	2	3	0	3	0
Ash, Canada ....load	2	10	0	4	5	0
Birch ,, ...	2	5	0	4	5	0
Elm ,, ...	3	10	0	4	15	0
Fir, Dantzic, &c.	2	0	0	3	15	0
Oak ,, ...	2	10	0	4	10	0
Canada	4	17	6	6	10	0
Pine, Canada red	2	10	0	3	10	0
,, yellow	2	0	0	5	10	0
Lath, Dantzic ....fathom	5	0	0	6	0	0
St. Petersburg	5	0	0	7	0	0
Deals, Finland, 2nd & 1st. std. 100	7	10	0	10	0	0
,, ,, 4th and 3rd	7	0	0	7	5	0
Riga	6	0	0	8	0	0
St. Petersburg, 1st yellow	9	10	0	14	10	0
,, ,, 2nd ,, ...	7	10	0	9	0	0
,, white	7	0	0	10	0	0
Swedish	7	0	0	15	10	0
White Sea	8	0	0	17	0	0
Canada, Pine, 1st	18	0	0	24	0	0
,, ,, 2nd	9	0	0	16	0	0
,, ,, 3rd, &c.	7	0	0	10	0	0
,, Spruce, 1st	8	10	0	10	10	0
,, ,, 3rd and 2nd ..	6	10	0	8	0	0
New Brunswick, &c.	5	10	0	7	10	0
Battens, all kinds	4	10	0	15	10	0
Flooring Boards, sq., 1 in., prepared, First	0	10	0	0	14	0
Second	0	8	0	0	10	6
Other qualities	0	5	6	0	7	9
Cedar, Cuba ....foot	0	0	4	0	0	5
Honduras, &c.	0	0	5½	0	0	4½
Mahogany, Cuba	0	0	4½	0	0	6½
St. Domingo, cargo average ..	0	0	4½	0	0	6½
Mexican ,, ...	0	0	4½	0	0	5½
Tobasco ,, ...	0	0	5½	0	0	6½
Honduras ,, ...	0	0	5½	0	0	6½
Box, Turkey ....ton	4	0	0	13	0	0
Rose, Rio	12	0	0	19	0	0
Bahia	10	0	0	18	0	0
Satin, St. Domingo ....foot	0	0	9	0	1	3
Porto Rico	0	0	10	0	1	6
Walnut, Italian	0	0	4	0	0	7

METALS.	£.	s.	d.	£.	s.	d.
IRON—Bar, Welsh, in London tn	6	5	0	6	15	0
,, ,, at works in Wales	5	15	0	6	5	0
,, Staffordshire, in London..	6	5	0	7	0	0
COPPER—British, cake and ingot	56	10	0	57	10	0
Best selected	59	0	0	60	0	0
Sheets, strong	66	0	0	0	0	0
Chili, bars	53	10	0	0	0	0
YELLOW METAL....lb.	0	0	6	0	0	6½
LEAD—Pig, Spanish ....ton	12	17	6	13	0	0
English, com. brands	0	0	0	0	0	0
Sheet, English, 8 lbs. per square foot and upwards....	15	0	0	15	5	0
Pipe	15	10	0	0	0	0
ZINC—English sheet ....ton	26	0	0	26	10	0
Vieille Montagne	27	0	0	0	0	0
TIN—Straits	91	15	0	0	0	0
Australian	92	0	0	0	0	0
English Ingots	94	10	0	0	0	0

OILS.						
Linseed ....ton	21	10	0	0	0	0
Cocoanut, Cochin	33	10	0	34	0	0
,, Ceylon	28	10	0	29	0	0
Palm, Lagos	25	10	0	0	0	0
Rapeseed, English pale	29	5	0	29	10	0
,, brown	27	10	0	0	0	0
Cottonseed, refined	18	0	0	0	0	0
Tallow and Oleine	21	0	0	40	0	0
Lubricating, U.S.	6	0	0	7	0	0
,, refined	7	10	0	12	0	0
TAR—Stockholm....barrel	1	1	6	1	2	0
Archangel....	0	14	6	0	0	0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BASCHURCH (Shropshire).—For the erection of Petton Hall, Baschurch, near Shrewsbury, for Captain E. B. Cunliffe. (Contract No. 1, main building, exclusive of walling, bricks, grates, chimney-pieces and electric light, and not including stables and lodges.) Mr. Thomas Bower, architect, Nantwich. Quantities by Mr. Henry Laverage, London.—

J. Stringer	£22,670	R. Beckett, Hartford, Cheshire*	£18,291
Kirk & Randall	22,309		
Treasure & Son	19,136	* Accepted.	

CLAPHAM.—For finishing for occupation six houses in Nightingale square, for "The Suburban Lands Syndicate." Mr. Thomas Spink, surveyor, 26, Charing-cross, S.W.

Wimsley	£785 0	Lawrence	£686 0
Brett	732 0	Edwards	597 0
Eyer	730 0	Wheeler & Co., Peckham Rye (accepted)	525 10
Rowsell	693 0		

HERTFORD HEATH.—For the construction of pipe outfall sewer, with manholes, &c., near Great Amwell, for the Ware Union Rural Sanitary Authority. Messrs. Bailey Denton, Son, & North, engineers, Palmerstonbuildings, Westminster, S.W. Quantities by the engineers:

George Bell	£866 12 0	Vase Bros	£639 14 3
Stoddart Hipwell	725 0 0	W. Gray	539 12 4
Porter & Co	716 14 6	J. Jackson	689 0 0
Iles & Co	689 4 0	J. G. Blomfield	580 15 0
J. Scott	686 18 0	J. G. Potter	580 0 0
J. Kavanagh	671 0 0		

IRVINE, N.B.—For cutting track and pipe-laying from filter-beds to the burgh, with relative works, for the Irvine Corporation. Messrs. J. & A. Leslie & Reid, engineers, 72A, George-street, Edinburgh:—

Stevenson	£2,560 13 11	W. S. Osborne	£2,140 15 9
H. Sharp	2 517 9 7	J. Urquhart	1 968 10 9
R. B. Stewart	2,228 18 0	Ninnno & Conjar	1,825 11 3
R. C. Brebner	2,145 9 6		

KEITH, N.B.—Accepted offers for repairs to the Manse of Boharm, Keith, N.B., for the Heritors of the Parish. Mr. F. D. Robertson, architect, Fife, Keith:

Thos. Stewart, Keith, *Mason work*	£227 0 0
James Dey Forbes, *Carpenter work*	155 0 0
A. & R. Wright, Keith, *Slater work*	61 0 0
Geo. M'Kay, Keith, *Plaster work*	28 10 0
James Rose, Elgin, *Plumber work*	72 15 0
Campbell Anderson, Keith, *Painter work*	55 0 0
Total	£557 5 0

LEEDS.—For the extension of the School at Hunslet Carr, for the School Board. Mr William Lambert, architect.

Cross & Carter, Bowman-lane, Leeds*	£745 0 0

* Accepted for all trades.

LEEDS.—Accepted for work in the erection of four houses and shops at Armley. Mr. C. Frederick Wilkinson, architect, 35, Park square, Leeds:—

Plumber and Glazier, Jno. Fawcitt, Leeds	£81 15 0
Plasterer, J. Walsh, Armley	61 10 0
Slater, J. Atkins & Son, Leeds	38 0 0
Painter, B. Beaumont, New Wortley	22 0 0
Total	191 0 0

LEEDS.—Accepted on schedule of prices for the erection of six houses near Queen's-road, for Mr. Joseph Popplewell. Mr. Thos. Howdill, architect, 13, Oxford-row, Leeds:—

Wintherburn & Thackeray, *Builders*, Woodhouse.
J. Ledgard & Son, *Joiners*, Ventnor street.
J. Atkinson & Son, *Slaters*, Whitehall-road.
J. Fox, *Plumber*, Hunslet-lane.
W. J. Haddock, *Plasterer*, Tong-road.
E. H. Walker, *Painter*, Tunstiley.

LONDON.—For the erection of warehouse at Friar-street, St. Andrew's Hill, for Messrs. Judd & Co. Mr J. Douglass Mathews, architect:—

Dove	£23,748	Nightingale	£23,187
Jerrard	23,682	Grover & Son	23,080
Williams	23,500	Kirby & Daykin	23,387
Lawrence	23,245		

LONDON.—For the erection of the Christian Institute, No. 19, Cornelia-street, Hoxton, for Mr. W. B. Woodhouse. Mr. N. Tuxford, architect & surveyor, 9, Arundel-street, Brighton:—

Colwell & Sons	£2,050	Lawrence	£1,870
Lee	1,941	Nightingale*	1,799
Clark & Bracey	1,891	Trussell	1,756

* Accepted.

LONDON.—For the erection of a pair of villa residences at 45 and 47, Clapham-road, S.W., for Mr. W. B. Rhodes. Professor Banister Fletcher, architect, 29, New Bridge street:—

H. J. Williams	£2,461	R. E. Nightingale	£2,369
Brass & Son	2,328	J. Garrad	2,245
Pocock Bros.	2,241	J. Godfrey & Son*	2,036
Hollingsworth	2,240	* Accepted	

LONDON.—For alterations and additions to 6 Blue Cross-street. Professor Banister Fletcher, architect, 29, New Bridge street, E.C.

Hollingsworth	£687	Burman & Sons	£640
H. J. Williams	685	W. & H. Castle*	528
J. Wynne	650	* Accepted.	

LONDON.—For alterations and additions to "The Crown" Hotel, Cricklewood, for Mr. A. W. Paul. Mr. Alfred J. England, architect, 33, Southampton-street, Strand :—
H. B. Oldrey, Albert Works, Kilburn (accepted) £2,400 0 0

[No competition.]

LONDON.—For alterations and additions to shop and lavatory at 20, High-road, Kilburn, for Mr. Charles B. Allen :—
H. B. Oldrey, Albert Works, Kilburn (accepted).. £256 0 0

[No competition.]

LONDON.—For building factory in rear of 241, Hackney-road, E., for Mr. Jacobs. Messrs. T. & W. Stone, architects :—

Warland	£783	15	0
Higgs	676	0	0
Beale	609	0	0
Wire	599	0	0
Thomerson & Son	533	0	0
Hughes	530	0	0
Jarvis & Sons	417	0	0

LONDON.—For alterations at No. 228, Upper-street, Islington, N. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove :

	Red General.	Red Mansfield.	Red Bricks.
Goodman	£339	£160	£140
Patman & Fotheringham	174	126	97
Schurin & Co.	143	145	136
Scrivener & Co.	142	158	111
Dove Bros. (accepted)	345	170	170

LONDON.—Accepted for lavatory's work and fittings, "Rising Sun," Commercial-road, Pimlico, for Messrs. Young & Co., Wandsworth. Mr. Keith D. Young, architect, 17, Southampton-street, Bloomsbury :—
Sanders & Sons, 228, High Holborn £169 15 0

LONDON. — For erecting boundary wall, railings, entrances, &c., to St. Botolph's, Aldgate, for the Commissioners of Sewers of the City of London. Mr. W. Haywood, Engineer :—
B. E. Nightingale (accepted) £988 0 0

LONDON. -For alterations and shop-fittings :—

73, Bishopsgate-road.

G. M. Greenwell, 5, Finsbury Square £425

107, London-road.

G. M. Greenwell 142 10 0

2, Great Queen-street.

G. M. Greenwell 120 0 0

MORDEN (Surrey).—For chapel buildings for new cemetery at Hobald's Farm, for the Burial Board for the Parish of St. Mary, Battersea. Mr. William C. Poole, architect, 62, Belleville-road, Wandsworth-common, S.W. :—

W. Neave & Son	£7,175	Jas. H. Jarvis	£4,983
Wm. Hammond	5,455	Hugh Knight	4,893
John Garrett & Son	5,400	J. G. Richardson	4,689
Jos. Dorey	5,060	Walter Wallis (accepted)	4,667
Thos. Gregory & Co.	4,95[illegible]	[Architect's estimate, £5,061.]	

NANTWICH.—For the erection of agent's house at Crewe-green, Crewe, for the Right Honourable Lord Crewe. Mr. Thomas Bower, architect, Nantwich. Quantities by Mr. Henry Lovegrove, London :—
John Stringer, Sandbach (accepted) £3,058 0 0

PLUMSTEAD.—For bar fittings at the "Dover Castle," for Mr. Lomax. Mr. H. H. Church, architect :—
Sanders & Sons, 228, High Holborn (accepted) £231 10 0

ST. IVES (Cornwall).—For the erection of a police-station and appurtenances, for the Cornwall County Council. Mr. Oliver Caldwell, architect, St. Ives-square, Penzance :—
James Julian £1,260 0 0 | Arthur Carkeek, Red-
Robert Toy 816 12 0 | ruth (accepted) £650 0 0

[Architect's estimate, £835.]

SOUTHEND (Essex).—For the erection of boarding establishment at Southend-on-Sea, for Mr. F. Foster. Mr. Edward Wright, architect. Quantities by Mr. Henry Lovegrove :

Nightingale	£4,888	Baker & Wiseman	£4,175
Ansell	4,884	Everett	4,1[illegible]
Smith & Sons	4,537	Woodhams	4,372
Orfeur	4,258	Dupont	4,0[illegible]
Dobson	4,189	Dark & Son, Southend	3,949

[Architect's estimate, £3,968.]

SUTTON (Surrey).—For building north aisle and vestries to St. Barnabas Church. Messrs. Carpenter & Ingress, architects & Cartoon-chambers, S.W. Quantities supplied by Mr. Geo. Jacks, 3, St. Christopher's-place, S.W. :—

Pace	£2,448	Smith & Sons	£2,215
Coils & Sons	2,310	Goddard & Sons	2,175
Beatley	2,[illegible]29	Humphries*	1,[illegible]
Wyatt	2,[illegible]2[illegible]	* Accepted.	

SWANLEY (Kent).—For the erection of home for the trustees of the Hospital Convalescent House. Mr. E. B. Tanson, M.A., architect :—
J. Shillitoe & Son* .. £29,1[illegible] | Paramore... £28,000

* Accepted; also accepted for floors being in walnut: oak, £2,000.

[For full list of tenders see p. 88 *ante.*]

YORK.—For the supply of ironwork in the erection of new cocoa works, for Messrs. H. J. Rowntree & Co. Messrs. Malcolm, Stark, & Rowntree, architects, 167 St. Vincent-street, Glasgow :—

Concrete Gutters, Columns, &c.

W. Thomlinson Walker, York (accepted .. £796 0 9

Metal Windows, &c.

C. C. Dunkerley & Co., York (accepted).. .. 423 11 0

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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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Vol. LX. No. 2504. Saturday, Jan 31 1891.

ILLUSTRATIONS.

The Beauchamp Chapel, Warwick.—Measured and Drawn by Mr. Harold Brakspear ..... *Four Single-Page Photo-Litho's.*

Competition Design for Congregational Church, West Kensington.—Messrs. Potts, Sulman, & Hennings, Architects ..... *Double-Page Ink-Photo.*

Byzantine Architecture: Illustrations to Professor Aitchison's Royal Academy Lecture ..... *Double-Page Ink-Photo.*

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Building Stones of the Madras Presidency, North-West Provinces, and Oudh.

THE recently-issued part of the "Records of the Geological Survey of India"* contains an interesting account of the mineral, &c., resources of the above-mentioned provinces of our Indian empire, by Mr. W. King, B.A., D.Sc., director of the survey. Much attention is given to the clays and building stones, a brief description of which might be useful to some of our readers.

Commencing with the resources of the *Madras Presidency*, we find that fine pottery, pipe and plastic clays exist in various parts of the country, extensive beds of high-class white or pale clays occurring, especially in the Upper Gondwana (Rajmehal) series. The Kuppam clays have yielded good results at the Madras School of Arts; whilst fine white clays are also found near Guntur, and china-clay (kaolin) comes from Nilgiri, North Arcot, and Vizianagram. Brick and tile factories are established at Calicut and Tirivaloy, the clay being obtained from the river beds of the neighbourhood.

Granites, gneisses, and other highly crystalline rocks are extensively developed in the Presidency, being largely utilised for building and ornamental purposes. Granites of many tints occur in Anantapur and Guti-Taluks, and first-class stone can be obtained at several places in the Bellary district. At Hampi there are many remarkable ruins, showing fine carvings in local granite, and many notable monoliths of great size. At Palaveram, Cuddaparai, and Patanpalam highly hornblendic gneisses are very largely quarried for articles of domestic use; the first-mentioned place also yields the rubble-stone used in the Madras harbour works. Granite is extensively raised at Tirukari and Seven Pagodas; whilst good stone is found in Kistna district, very handsome in colour and texture, and taking a fine polish, especially that at Kondavidu. Red granite occurs in Madura, and here also a pale-banded hornblendic rock is largely worked for temple pillars. In North Arcot beautiful and useful granites and gneisses abound—that from Sholingar is much used in Madras. A porphyritic stone is found on the western flank of Yailagiri, in Salem; and pale granitoid rock with pink garnets is extensively raised at Waddakarai, in Tinnevelly district. Quarries west of Perambalur village, in Trichinopoly, produce the black hornblendic stone of which the great Tanjore bull and other fine monoliths are said to be made.

Laterite is a very common rock in many parts of the Madras Presidency, occurring along the coasts and stretching over vast expanses inland, and is the ordinary building stone of the country. We may pause for a moment to describe this remarkable material. The rock laterite does not admit of a very clear diagnosis: it is exceedingly variable in composition, having been derived from several different formations. Frequently it is red and earthy, occurring in beds lying between basalt and other lava flows, and in some instances it results from their decomposition. Generally it appears to be an alluvial formation of gravel and conglomerate cemented more or less by a ferruginous paste—usually sesquioxide of iron—and has been laid down in comparatively recent geological times, inasmuch as flint implements of human manufacture have been discovered in it. It has been employed for building purposes from early times in Orissa, Midnapur, Trichinopoly, and Tanjore, and was much used in the construction of temples and other ancient structures. Laterite is largely quarried in Madras, amongst other places, at Shahkotai, in Madura district, and at Nellore, where the stone is very good.

Limestones of different kinds are also extensively developed in the Presidency. Near Coimbatore a crystalline limestone is found of pink and grey tints (almost white in places), which takes a high polish, and is admirably adapted for interior decoration. At Narji, in Cuddapah district, we get flaggy and thin-bedded limestones of shades of grey, blue, buff, and fawn, and some are nearly black. These were largely employed in the construction of the Madras Railway; the black variety, known as "Narji Stone," is also used for ornamental purposes in Madras; it takes a fine polish, and is stated to be specially useful for interiors. Near Namakal large deposits of pink, grey, and white limestones of excellent quality exist, and in Trichinopoly is found the well-known shelly marble of that name. Magnesian limestones, 12 ft. to 14 ft. in thickness, of yellow-buff and brownish-red colours, predominate in the Godavari district. At Tutikorin, rock-coral is, curiously enough, used for coarse building purposes; and lime is commonly manufactured from the sub-recent shell-beds in the backwater deposits, and from kunkar, which occurs locally.

The Presidency also contains several sandstones of good quality. Amongst others, we may mention those of Cuddapah and Godavari. In the latter district, at Tundkalpudi, a buff granular felspathic rock, exceedingly durable, —a most useful stone,—is found. Near Guntur red and purple sandstones are obtained, which, to judge by old ruins, were much esteemed by the Jains; and to this day they are extensively quarried by the Public Works Department. The same department also utilises the hard greenish, or blueish-black calcareous sandstones, found near Budavada, in Kistna. At Valimukkam, in Madura, a great quarrying industry once existed, large masses of calcareous, gritty sandstone having been raised and shipped, probably to the great temple at Rameswarum; whilst at Sivagunga, in the same district, the working of the dark, purplish-grey, hard grits, with brown bandings, still gives employment to a number of natives. Flags are found and dug at Razpudi, seventeen miles N.N.E. of Ongole, in Madura. Several calcareous sandstones occur at Panamparai, in Tinnevelly, of a fine, cream-coloured or brownish tint, which were used in constructing the great churches at Megnanapuram and Mudalur, as well as the large temple at Tiruchandur, on the coast, south of Tutikorin.

No true slates are found in the Madras Presidency, though small, rough slabs are procurable. The many kinds of trap rock furnish good materials for road-making and rough building.

Turning now to the resources of the *North-West Provinces and Oudh*, we find that pottery and tile clays abound, whilst pipe clay exists as an extensive deposit at Kol Garhaia, in Banda. Comparatively few of the highly crystalline igneous and metamorphic rocks are drawn upon; but at Almora mica-schist,

* Part 3, vol. xxiii. (1890), p. 130 *et seq.*

and at Naini Tál clay-schist are used as building stones. At Ranikhet a pale-coloured gneiss forms a handsome and lasting material.

The aqueous rocks, however, are common enough. Amongst limestones we get the peculiar tufaceous, or travertine rock known as kunkar (or dant), which is the prevailing building stone of the North-West Provinces. Quarries in this deposit occur all over the Aligarh district, where block kunkar costs a rupee per hundred cubic feet to quarry, and 8 annas per mile for transport. It is also distributed over the Cawnpur district, but the quarries near the city are, it is stated, becoming exhausted. Other kinds of limestone are locally raised.

Fine sandstones are quarried near Agra, and we learn that the more valuable ones, those for instance at Tántpur, Basai-Jagner, and Baghaur are worked by members of the carpenter (Barhái) caste. Each man pays the lord of the manor a seignoralty which, according to the locality and the colour of the stone, varies from 2½ rupees to 4½ rupees yearly. The price of fine sandstone at the quarry itself is, for the white or grey variety, 7 rupees; and for the red kinds, 5 rupees to 6 rupees per hundred maunds. The price at Agra of the best stone from Khairagarh is, for the grey variety, about 50 rupees or 52 rupees the hundred maunds; and for the red, about 34 rupees to 35 rupees. Large quantities of sandstone are sent from Chhibún-pargunnah to Allahabad and vicinity. The Chunar (Mirzapur) stone is famous all over India, and is said to be unsurpassed in fine grain, compactness, and size of blocks; it is usually of a pale buff colour, and takes the most delicate carvings and mouldings.

It is an unfortunate circumstance that, as in Madras, no slates comparable with those of North Wales occur in any part of the immense territory under consideration; but clay-slates of inferior quality are raised here and there.

ADJOINING OWNERS UNDER METROPOLITAN BUILDING ACT.

THE question as to the person who falls within the term "adjoining owner" within the meaning of the Metropolitan Building Act, 1855, is one of considerable practical importance. Intentionally, or not, no definition has been given by the Legislature of this term, though by section 85 three months' notice must be given by a building owner to an "adjoining owner" before he can do ordinary work to a party structure. If any omission occurs in regard to this notice, the consequences are serious, and, therefore, it would have been much better if the Legislature had had the courage and the wisdom to state who should be considered an "adjoining owner." As it is, judicial decisions must be perused in order to find out what persons are covered by the term. We propose briefly to refer to these decisions, since a recent one of much importance has lately been reported in the "Law Reports" for the present year. The case to which we refer is that of Fillingham *v.* Wood, which was decided by Mr. Justice Chitty. Fillingham occupied a shop and parlour with a workshop adjoining, the front kitchen, and a back bedroom on the third-floor in a house at the West-end of London. These premises were held under an agreement for a term of three years. The landlord of the house held a long lease from the Crown, but only occupied the front room on the third-floor, part of the house being let to another person, who occupied the rooms which were not let to Fillingham. No notice under the Metropolitan Building Act, 1855, was given to Fillingham in regard to work to a party-wall; the building owner merely serving the notice on Smith. Mr. Justice Chitty held that notice should have been given not only to Smith, but also to Fillingham. It is clear, therefore, from this decision that a person in possession or occupation of a part of a house under an agreement for a greater period than a year is "an adjoining owner" within the meaning of the Act. In section 3 of the same statute an owner is stated to be "every person in possession or receipt either of the whole or of any part of the rent or profits of any land or tenement, or in the occupation of such land or tenement other than as a tenant from year to year, or any less term, or as a tenant at will." But while this section speaks of profit, of part of a tenement, it does not say "in occupation of part of a tenement." Therefore, the result of the case now under review is that the definition of "adjoining owner" must be the above, with the insertion of the words "or in the occupation of part of a tenement." This, of course, throws greater responsibility on the building owner, since he has to make more careful inquiries as to the person who must be served with notice before the doing of work to a party structure. A case somewhat the reverse of the last one, namely, Hunt *v.* Harris, decided a good many years ago, should be referred to in connexion with this recent decision. It arose on the 97th section of the Metropolitan Building Act, but to a large extent it helps to a definition of the words "adjoining owner" in regard to the service of notices. In this case, the lessee of a house for ninety-nine years who sub-demised part of it for various smaller terms, though the sub-tenant held for a longer term than year to year, was held liable to contribute to certain expenses. That decision makes the lessee under a long term an adjoining owner, even though the owner in fee simple may also in the eye of the law be an adjoining owner as well as the tenants of various parts of a building. Again, the case of Cowen *v.* Phillips, decided by the late Lord Romilly, decided that a person having an equitable interest, as under an agreement for a lease, was an adjoining owner. The plaintiff in that case was in possession of a shop and parlour under an agreement for a lease—in other words, he had only an equitable interest in the premises. Moreover, the house was divided into two, so that, apart from the question of equitable interest, it differed in its facts from Fillingham *v.* Wood. But if we read this latter case and Cowen *v.* Phillips together it shows that a person in occupation of part of a building under an equitable title is an adjoining owner within the meaning of the Metropolitan Building Act, 1855. The result of the current of judicial decisions has, therefore, been to enlarge considerably the definition of "adjoining owner," and to throw on the building owner the burden of giving notice to every person, whether landlord or tenant, unless he be merely a tenant from year to year or for a less period. It would seem, in fact, not to be safe to abstain from serving any person other than a mere lodger with notice of the intention to do work to a party structure.

NOTES.

THERE is no position in which philanthropists as a rule show to less advantage than in their no doubt well-meant endeavours, from time to time, to act the part of the champion of the over-worked railway servant. As a general rule, the champion knows nothing whatever of railway work, and proposes reforms which are impracticable in principle, based on conclusions which are not founded on fact. Mr. Channing's demonstration on Friday last week in regard to overtime on railways was no exception to this rule. His resolution included the principle that the Board of Trade should interfere to limit hours in a service which from its very nature must be to a great extent elastic in its arrangements, and stigmatised as "a grave social injustice" the so-called infliction of overtime on employés who, as is absolutely testified by those who have the best means of knowing the truth, are so desirous to claim overtime and its extra wages that stringent regulations have had to be passed and enforced to prevent their doing so under circumstances when it might have been easily avoided. Sir Michael Hicks-Beach, in his very sensible and impartial speech, referred to the fact that drivers have such an attachment to their own engines that they would in many cases prefer to work extra hours rather than let a deputy on to the foot-plate. But of this kind of feeling the doctrinaire philanthropist is not likely to know much. The excuse for Mr. Channing's demonstration of course is the Scottish railway strike, a movement in which, whatever grievances they may justly have had to complain of, the men have put themselves directly in the wrong; firstly by breaking their contract with their employers, secondly by public violence. If the company, to gain some end of their own, had broken their contract with the men, what indignation would have been aroused in the philanthropic ranks! But for the men to break their contract with the company apparently is a virtue, and a proof of spirit and independence. The philanthropists assert that public safety requires that the men be not overworked. Railway managers may reasonably reply that public safety demands that discipline should be maintained among an immense body of men whose co-operation is necessary for the working of the great machine of railway traffic. Sir Michael Hicks-Beach's resolution to the effect that the employment of railway servants for excessive hours is a danger both to themselves and to the public (a proposition which every one will admit), and that a Select Committee should be appointed to inquire "whether and in what manner the hours worked by railway servants should be restricted by legislation," is a more reasonable way of putting the subject, laying it open for inquiry without endorsing the principle of government interference which might be either impracticable or mischievous; and as Mr. Channing's motion was defeated, we presume that the President of the Board of Trade stands morally pledged to carry his amended resolution into action at the earliest opportunity.

THE Bill introduced by the Government to establish a Commission for Scotland to whom private Bill business should be referred in place of a Parliamentary Committee, was not received as well by some of the Scotch members as was to have been expected. The composition of the Commission seems satisfactory enough: the legal and the commonsense element are fairly mixed. It must be a better tribunal than an ordinary Parliamentary Committee, and it has the further advantage of being a body which will transact Scotch business in Scotland. The idea of some members of the Opposition seems to be that the work of the Commission might be done in some way by the Municipal bodies. We cannot concur in the wisdom of this suggestion. In many cases municipal bodies are either the promoters or the opposers of private Bills. What is needed is a thoroughly impartial and competent tribunal. Hitherto, public works have been free from the jobbery which is rampant in France and in America. If municipal bodies had the power of granting or refusing the doing of public works in the nature of railways, waterworks, and so forth, local lobbying would at once spring into being. If the composition of the Commission can be improved, well and good; but the principle and general form of the Bill is right.

A DEPUTATION which waited upon Sir Michael Hicks-Beach last Friday, representing the Central Chamber of Agriculture, obtained a definite declaration from the President of the Board of Trade regarding railway terminals. The deputation were told that there was no necessity for them to enter into an argument upon the subject, because, so far as the Board of Trade was concerned, their minds were made up. They had come to the conclusion that they ought to accept the principle, and propose it to Parliament. It has been apparent for some time that the Board of Trade had determined upon this

course, but, so far as we know, this is the first time that this determination has been publicly avowed. There is still a very strong feeling that the Board are mistaken in their view of the matter, and further efforts will probably be made in Parliament to defeat the railway companies on this point. Sir E. Birkbeck, M.P.,—who introduced the deputation alluded to,—singled out the Great Eastern Railway for commendation; stating that they are conciliatory to all traders, and remarking that the other companies might well take example by them. The Great Eastern were the only company specifically mentioned, and, singularly enough, a letter has recently been published on the subject of railway rates, in which the writer similarly refers by name to this company alone, but in the following terms:—"The Great Eastern Railway are doing their best to strangle traffic, for they not only charge exorbitant rates, but they alter the invoices of other railways so as to raise the charge." This rather grave accusation appears side by side with Sir E. Birkbeck's "honourable mention" in an agricultural contemporary for the current week.

IN reference to some remarks in this column about the Soane Medallion last week, we find we were in error in supposing that it is a trust fund, the Medallion and the 50*l.* being provided from the Institute funds as a prize founded in memory of Soane. This would of course give a different aspect to the feeling which we were told existed in the Institute as to not liking to keep back the money, though we think the Council could afford to disregard any imputation of interested motives on that head, if they were ever made. We are also informed that for two years the time for study abroad has been reduced from six months to three, and is to be so this year, but we imagine this is not at all generally known, for our remarks were in fact made in consequence of a conversation with a competitor for one of this year's prizes, who said that he would like above all things to go in for the Soane, but "could not afford it," partly in consequence of the six months' stipulation. The reduction of the time makes this easier, though we would rather see the full six months' study kept up and the endowment doubled, and in that view beg to repeat our suggestion that any wealthy man who wishes to encourage architectural study could not do so better than by bestowing an additional endowment on the Soane Medallion. Failing that, would it not be worth while to consider the advisability of making the competition biennial, and concentrating 100*l.* on each award, as it seems that the annual competition with 50*l.* fails to evoke all that is desired? There is a precedent for this in the case of the Royal Academy, one of the best prizes in connexion with that institution being given at intervals of two years.

IT is to be hoped that there will be a good meeting at the Institute on Monday evening to hear Baron de Geymüller's paper on "Bramante," and to do honour to a distinguished French student of architecture, for such we believe Baron de Geymüller is, in spite of his German-looking name. He has devoted his attention to the study of unpublished drawings and documents in connexion with eminent Renaissance architects, and we noticed some time since his valuable and interesting monograph on "Bramante and St. Peter's" (*Builder*, March 5, 1881). The paper, we presume, will be read in English, for Baron de Geymüller adds to his other accomplishments that of being an excellent linguist.

WELCOME to an old friend, too long missed! Once more we have the pleasure of seeing the familiar yellow wrapper of the *Revue Générale de l'Architecture*, which had ceased to appear for so many months that its best friends had almost given it over. A legal contention between the proprietors and the printers has been, we believe, the cause of this lengthened suspension, which in England would spell ruin to a periodical publication, but in France subscribers take these things more philosophically, or perhaps have a greater feeling of loyalty to their favourite publication. The new number of the *Revue* is somewhat brief in literary matter, but it contains no less than fourteen finely-executed plates, including an interior at the Château St. Leger, another at the Château de Cheverny, a remarkable doorway from the Gozzadini Palace at Bologna, a series of comparative plans and sections of Art Museums, and various illustrations of domestic and other modern work.

THE January number of the Palestine Exploration Fund's *Quarterly Statement* is largely occupied with Herr Schick's account of his recent investigations, including a discovery of an ancient bath and cistern near Bethany, an examination of the remains of the "Second" Siloah aqueduct, and a search for the St. Peter's, or, as it is called, the "cock-crow" church on Zion. In the course of this latter search a Roman mosaic floor was found, of which an illustration is given, apparently part of some bath buildings. The bricks in connexion with it have a stamp on them. Herr Schick says "We learn from them that these baths were made in the midst of the ruins by the Roman soldiers of the tenth legion. As such are found elsewhere also, as I have reported from time to time, it would seem that this legion was stationed for a long time at Jerusalem, and perhaps that their tools for brickmaking may have been used afterwards by others, possibly even by the natives."

WE hear that Mr. Elliot Stock will publish a series of volumes, to be edited by Mr. T. Fairman Ordish, F.S.A., under the name of the Camden Library. The books will treat upon various subjects connected with British antiquities and archæology. The issue for this year is to consist of "Curiosities and Antiquities of the Exchequer," wherein Mr. Hubert Hall, F.S.A., of our Public Record Office, deals with the Exchequer House and Court, and what may be called the "Civil Service" of a by-gone day; "Old London Theatres," being a history, by the editor, of the theatres in London from the times of the Burbages to their suppression by Parliament in 1647; "English Homes in the Past," by Mr. Ralph Nevill, F.S.A., whose several articles upon cottage architecture will be remembered by our own readers; and an instalment of Camden's own work, "Britannia," with the valuable county maps, and Holland's translation (1610). Among succeeding volumes, the following are announced:—Mr. W. H. St. John Hope's "Monastic Arrangement;" Church Plate, by Mr. St. John Hope, F.S.A., and Mr. T. M. Fallow; one by Mr. J. J. Foster, upon Miniature Portrait Painting; and another upon English Armour, by the Hon. H. A. Dillon, F.S.A.; a treatise upon Parochial Church Life in Mediæval England will be undertaken by the Rev. Dr. Cox, editor of the *Antiquary*, and author of "Derbyshire Churches," &c.; a volume, entitled "Folk Lore," by the editor and Mr. G. L. Gomme, F.S.A., Director of the Folk Lore Society. A set upon the manners and customs of the English people, at different epochs, will form a complement to Mr. Nevill's work; and Mr. Drummond-Milliken will tell the story of the streams of London. The books, post 8vo. size, and illustrated and indexed, will be issued quarterly.

A MEETING of the united Vestries of St. Mary Woolnoth and St. Mary Woolchurch Haw was held last week, to consider the City and South London Railway (Islington Extension) Bill. Under that Bill power is sought to take the Church of St. Mary Woolnoth, together with its graveyard. By reason of its position and design, both within and without, this church, standing in Lombourne Ward, is one of the most striking, as it is certainly the most original, of the eighteenth-century London churches. The Lombard-street front, without windows, is different from the south. The work of Nicholas Hawksmoor (and finished in 1727), it is said to have inspired Servandoni's and Maclaurin's work at St. Sulpice, in Paris. The latter—the Temple of Victory during the Revolution—was begun in 1646, but was not completed until seventy-five years afterwards, *teste* Murray.* The interior was re-arranged in 1875-6, under the superintendence of Mr. Butterfield, architect, when the galleries were removed, and their ancient front panelling fixed against the walls. The organ, against the north wall, east end, by Smith, 1681, was rebuilt by Messrs. Gray & Davison twenty-three years since. For some months in 1886 the church was closed owing to the insanitary condition of the vaults below; under the direction of Mr. F. C. Penrose, the under surface of the vault arching was covered with iron joists, and concrete overlaid with two ½-in. thicknesses of asphalte. St. Mary Woolnoth is the parish church of the Mansion House, which covers the site of St. Mary Woolchurch Haw, by the Stocks Market, in the graveyard of which the aulnagers used to supervise the weighing of wool. Built on the site of a traditionary temple of Concord, the original church of St. Mary Woolnoth (re-built in 1620, and repaired by Wren) is cited as early as 1274 in Dr. Sharpe's Calendar of Wills proved and enrolled in the Court of Husting (Part I., 1889), whereby Geoffrey Godard devises to the church half a mark annual rent for arrears, and to his eldest daughter, Johanna, his capital house in the parish. Writers differ as to the origin of Woolnoth: in the *Athenæum* of March 31, 1888, Mr. J. H. Round propounds his theory about "the obvious derivation . . . from the Anglo-Saxon Wulfnoth," of whom we would gladly know more, and says he has found the name as Wlnotmaricherche in a deed of 1191; some derive it from wool hithe,—but the wool wharf lay near to the Tower. "Note" signified business or traffic; and the church's connexion with the wool trade seems to obtain general acceptance. Hawksmoor, upon Gibbs's resignation, was appointed surveyor (with J. James) to the Commissioners for building the new churches, January 6, 1716. He thus was architect of St. Anne, Limehouse, restored 1851-4 by Morris & P. Hardwick; St. George-in-the-East; St. George, Bloomsbury; and Christ Church, Spitalfields. The working drawings for all these are in the British Museum. For his grave, and its stone, at Shenley, Herts, see the *Builder*, vol. xx., pp. 562 and 590.

THE second number of the Transactions of the Edinburgh Architectural Association, just issued, contains some interesting papers on old monuments, including one by Mr. MacGibbon on Tantallon Castle. There is a paper on the New Town of Edinburgh, forming the valedictory address by the President, Professor Baldwin Brown, who defends the regularity and uniformity of design of the New Town, as more in keeping with what was required than any attempt to emulate or imitate the picturesque irregularity of the Old Town. A similar view was taken in a paper read by the editor of this journal at the Edinburgh Congress of the National Art Association, at which it was maintained also that the regular lines of the New Town formed the best possible contrast with, or base for, the irregularities of outline and plan in the Old Town.

WE have received the seventh annual report of the Manchester Technical School, which seems to be both prospering itself and becoming the cause of prosperity in others. It is gratifying to read, in the report of the boys' commercial and manual training school, that the school has, in many instances, "helped to determine the pupils' aptitudes, and fix their career. Many who under ordinary circumstances, would have simply swelled the overstocked ranks of clerks

* For Servandoni's share in the design of St. Sulpice see our review, on January 28, 1888, of Mr. Augustus J. C. Hare's "Paris." The towers are 231 ft. high, exceeding those of Notre Dame by 9 ft.

and warehousemen, have, under the stimulus and training they have received, entered upon some business where manual skill and dexterity are essential conditions of success." The school is doing an excellent work if it helps beginners in life to take part in some work requiring special skill, instead of drifting into that vague profession of clerkship, which too often is taken to merely because a boy has no knowledge, talent, or training that would fit him for anything better.

WE have referred in another note to the debate in the House of Commons last week on railway overtime. The illogical ideas prevalent on this subject were further illustrated in a short conversation in the House of Lords on Monday, when Lord de la Warre moved for a copy of the report to the Board of Trade on the railway accident at Wortley on December 24 last, as belonging to a class of accidents due to the overworking of employés. It was a fact that the engine-driver had been on duty eighteen hours, during most of which time however he had been stationary on account of a dense fog, but he had nothing to do with the accident, the blame of which rested with a signalman who had only been on duty seven-and-a-half hours.

VARIOUS improvements have recently been made in hansom cabs. The recent models are more comfortable generally, they have noiseless wheels, doors that are opened by the driver from his seat, and occasionally a pneumatic signal to direct the driver, though this last requirement must be of rather rare occurrence, as in an extensive use of cabs we have only come across it in two instances. But there are two simple improvements very obviously called for, and which seem to have been entirely overlooked. The first is a shield for the front portion of the wheels. In muddy weather it is exceedingly difficult for a woman, or for a man wearing a long overcoat, to get in or out of a hansom without carrying away some mud from the tire of the wheel on their dress. A leather dirt-shield placed over one-quarter of the periphery of the wheel would at a small cost prevent this annoyance. The other matter we refer to is more serious, as it is a question of danger to the occupant of the cab. As every one knows, the front window in a hansom can only be let down and pulled up by the driver, at the request of the occupant conveyed through the trap-door. This is very inconvenient in any case; but in the case of a horse running away or becoming restive it adds materially to the chance of injury to the occupant. Not long since we met a cab with a runaway horse careering wildly along Great Marlborough-street, with the glass down and a lady inside. Fortunately the horse was pulled up at the corner without any harm being done; but if he had either fallen or run into anything, the lady must almost inevitably have been thrown forward with her face through the glass, and been perhaps dangerously injured, or disfigured for life. The driver, even if he thinks of it (which he probably does not), cannot draw up the window at the moment, for he is fully occupied in trying to guide and to pull up his horse. On which account all hansom-cab windows ought to be fitted so that they can be raised or lowered by the occupant without the assistance of the driver. If attention is not paid to this by the builders and owners of cabs, we hope that the licensing authorities will take some steps to compel the adoption of this very necessary improvement, which there can be no practical difficulty in carrying out.

WE ought perhaps to notice the fact that Mr. Wall, the builder who came so prominently before the public in connexion with the building of the Kilburn-lane Schools for the London School Board, has had his discharge as a bankrupt suspended for four years, on the ground of grave misconduct in his business. Whether this sort of punishment is of much general deterrent effect may well be doubted; on the other hand, it is quite just that a bankrupt who has traded recklessly or has been guilty of misconduct should not be discharged with the same ease as a bankrupt who has failed purely through misfortune.

THE original Dean Free Church, Edinburgh, erected shortly after "The Disruption," has recently been deserted by the congregation for a new structure further west, and has been acquired by Mr. W. G. Stevenson, the sculptor, and by him converted into a studio. Mr. Stevenson thus reverses the practice of olden times, when the temples of the gods were converted into churches. It is somewhat startling to see a colossal statue of Wallace occupying the place of the pulpit, and Venus and the Graces attitudinising in the aisles.

THE Corporation of Leith have acquired a portion of ground at Starbank which is to be converted into a public park. In the course of the operations there was dug up what was considered a specimen of an ancient iron "joug," or collar, in which offenders against ecclesiastical discipline in Scotland were at one time compelled to stand at the church doors, or other public places, to do penance. The article was found about 2 ft. under ground, and was taken to the Town Council Chambers, where it excited much interest and speculation; one member of Council, it is said, having suggested that it might form "the nucleus of a Municipal antiquarian museum." The interesting object, however, turns out to be a hasp used for the adjustment of the mast of a fishing-boat, such as may be seen in use at the present time. A well-preserved specimen of a "joug" remains attached to the wall at the entrance to Duddingstone Church, near Edinburgh, and one or two examples exist in other parts of Scotland.

THE water-colour drawings by Mr. G. S. Elgood, now exhibited at the Fine Art Society's Gallery under the title "A Summer among the Flowers," turn out to be a very charming collection indeed. The subjects are of the most fascinating kind, being mostly scenes in the gardens of well-kept old mansions, in full summer; and the execution of many of them is beautiful. No. 12, showing part of an old house with its grass-lawn and flower-beds, is one of the best; "The Time of Roses" (18) is a large drawing showing part of a garden enclosed in massive architecturalised yew hedges, with a luxuriant bed of roses in the foreground, which are most beautifully and delicately painted; "Compton Wynyates" (24) is excellent not so much in detail as in general picturesqueness and true open-air effect. There are many other beautiful nooks most lovingly painted, among the seventy drawings, which make an exhibition well worth a visit.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting on Wednesday, January 21, Mr. J. W. Grover, F.S.A., in the chair, various antiquities were exhibited, including some curious Dutch tiles, found in pulling down Nos. 210 and 211, Piccadilly. The first paper read was by Mr. C. Lynam, on the carvings of the curious font at Lapley, Staffordshire, a remarkable and hitherto but little-noticed work of early Norman date. The paper was illustrated by plaster casts and drawings. The second paper was by Dr. Russell Forbes, read, in the author's absence, by Mr. W. de Gray Birch, F.S.A. It detailed the recent discovery of two temples of Etruscan date at Faleria. The subject was illustrated by a great many photographs of the objects which have been brought to light. Others were also exhibited of some of the most recently-found art works of Rome, where the progress of the new works are constantly bringing to light not only portions of the ancient buildings, but of statues and other sculptures.

BYZANTINE ARCHITECTURE.*

BY PROFESSOR AITCHISON.

ALTHOUGH iron has been used largely for various structures, it is not likely that in our time and in our country it will take the place of more time-honoured materials,—at least, for monumental buildings. Its contraction and expansion under the influences of cold and heat require special arrrangements not always easy to provide; from its rapidly conveying heat, and thus condensing the moisture of our atmosphere, it is objectionable for inhabited structures; from its liability to rust it has to be constantly oiled, varnished, or painted, for as yet the "Barff" process has been little used; while in a conflagration the behaviour of iron is simply disastrous.

We must, therefore, still look to the employment of marble, stone, burnt brick, terra-cotta, concrete, mud, and timber, for the main part of architectural structures. Every architectural structure of these materials is necessarily full of lessons for the architect, for there must have been the requisite conditions to fulfil in its plan and elevation, *i.e.*, the arrangements for the particular exigencies of the building, and the space and lighting required by the climate, as very different provisions must be made for a building in the North of Scotland, where damp, mist, rain, and snow prevail, from those required in a building for the dry and burning air of Egypt, or for the deadly heat and torrential rains of India.

The construction of every building must, too, have been adapted to the materials employed, while its æsthetic conditions must, at least, have been three-fold.

In the first place, the national or local ideas had to be embodied; in the second place, the prevailing taste had to be satisfied, as far as pure architecture was concerned; and, in the third place, the ornament had to be such as appealed to the taste and knowledge of the people; by the word ornament, I mean not only floral ornament, but figure-sculpture, painting, and mosaic. The execution must also have been adapted to the prevalent light and atmospheric conditions. We see, for example, that all the details of Greek buildings are designed for bright sunshine and a clear air; nothing is tamer and less effective than Greek architecture in England; and though Gothic details are admirably suited to a misty climate, they would doubtless look vulgar and obtrusive in a sunny one. At certain times a near approach has been made to perfection in these particulars, and such architecture is called *Classic*. There have, however, been epochs in architecture which are peculiarly capable of affording us instruction, as we are constantly having fresh material wants to satisfy, fresh appliances to use, fresh adaptations to make, and we are eagerly expecting the rise of a national æsthetic want to satisfy too. In many ways the most instructive epochs for us are those in which buildings have been required for new purposes, when the old traditions of construction have been improved upon, and when the canons of art have been changed. Any one of these new conditions may cause such modifications in buildings as to make them the forerunners of a new style, and when all of these conditions are present the new style has the highest claims on our attention. There are other considerations outside the former which invest a style with extrinsic interest, which may be roughly given as follows:—When it has prevailed for long periods of time over vast tracts of the earth, and when it has been the groundwork from which other styles have arisen, I have, therefore, chosen Byzantine architecture for my present course of lectures, as it fulfils all the conditions mentioned.

The heathen world had become Christian by Imperial edict, and the requirements of a new worship had to be provided for. The dome became an almost essential part of an important church, so that different canons of proportion were necessarily applied to these new domed structures, and a new style of ornament was adopted. Next, as to the prevalence of the Byzantine style, after the founding of Constantinople it was used in all new buildings erected, during a certain period of its existence, from Britain to the Tigris, and from the Rhine and the Danube to the shores of Africa; it lasted at Constantinople and in the lower Empire for a thousand years. Not a century

* Being the first Royal Academy Lecture on Architecture this session. Delivered on Monday evening, January 26, 1891.

after the Byzantine style had arrived at its perfection, in the days of Justinian, the Saracen invasion called for its application to the building of mosques and minarets for the Mussulman faith; though, so admirably did the Christian churches suit the new faith, that a large proportion of them were converted into mosques.

At a later time it had with the Roman and Romanesque of the West an important influence on the emergence of Gothic. In using the terms Roman and Romanesque it may be necessary to give some sort of rough definition, and some sort of arbitrary distinction, for all living architecture is gradually progressive, but its progression is not always in a direct line. Though architecture mainly depends on the active use of the architect's mental powers and on his native capacity, it also depends on the requirements and cultivation of those for whom it is done, and on the existing type; architecture may progress on one or two, or on all of its three main lines, *i.e.*, that of æsthetic excellence, that of planning, or that of construction. I think we may roughly call Roman all buildings executed in Rome, or for the Romans up to the early part of the fourth century A.D.,—*i.e.*, up to Constantine's dedication of Byzantium as the new capital of the Empire in 330 A.D., though what we now call Byzantine methods had begun to be adopted long before that date. Though buildings were erected by the Romans in various parts of Europe after the sacking of Rome in the fifth century, we hardly call any building Romanesque that was not built by or for the Barbarians who had overrun the West of Europe. The word "Romanesque" was first used by De Caumont early in this century as defining the round arched architecture of the Dark and Middle Ages, before Gothic had sprung up. The word Romance or Romanesque was originally applied to architecture much as it was to literature, and meant the current Roman method of building as the others did the Roman vernacular.

Byzantine architecture has, too, another claim on our attention, as it sprang up at a time when the art of Rome was at its lowest state of degradation, and not a century before the inroads of the barbarians had begun to disorganise society, and the dark ages were about to set in in the West. Byzantine architecture may be said to be pre-eminently Christian, just as Gothic may be called Roman Catholic architecture. Byzantine architecture did not technically begin until Christianity had become the State religion, and the capital of the Roman Empire was transferred to Byzantium. But every art and science in this world slowly progresses from small beginnings; the sharp stone fixed in a cleft stick led the way to the chipped flint tied on to a handle, this to the polished stone weapon, this to the bronze weapon, and finally to the steel one. Nothing is made by man out of nothing; there is, of course, the primary invention or discovery, this discovery or invention is slowly improved upon up to a point, and then the concurrence of many favourable circumstances causes the progression to be rapid; circumstances change, and the progress is scarcely perceptible, or is stopped altogether. The Romans, who valued nothing but fighting, oratory, law-making, and husbandry, treated with contempt those who designed their buildings, modelled their statues, or painted their pictures, who, for the most part, were slaves or freedmen, and scarcely deigned to mention their names, much less to give an account of their works, though we have, it is true, a letter of young Pliny to his supposed architect Mustius, and an epigram of Martial on Rabirius, the architect to Domitian's palace. It is only by knowledge and reflection that we are sure that buildings which seem to be brilliant inventions must have been copies of existing ones, enlargements of smaller ones, or developments from similar buildings with which the Roman architects were acquainted. If we did not know this, some epochs in Roman architecture would be marvellous,—the Pantheon, for instance. We are not even sure of the name of Agrippa's architect, who designed the Pantheon; it has been attributed to Valerius of Ostia, and to L. Cocceius Auctus, but we feel certain that whoever he was he was well acquainted with large domed structures before he undertook the Pantheon, and that this experience was probably gained in Persia. Architecture is so obtrusive an art that its great creations stamp themselves on the mind, and any striking work is sure to be reproduced time after time. The dome of the Pantheon was not only the prototype of many Roman and Byzantine structures, but has been copied and paraphrased even to our own time.

Byzantine architecture was but the logical conclusion of all those gradual changes and improvements in Roman construction which converted it from a post-and-lintel style into a perfect vaulted and domed one, only this transformation was quickened at Byzantium by the larger employment of Greek and Oriental architects, possessing different tastes and different experiences from their Roman compeers.

No sooner did Constantine the Great (272-337) transplant the capital of the Roman empire to Byzantium than he was in headlong haste to make this small city surpass Rome in architectural magnificence, and to erect imposing monuments in honour of his new faith; for he believed that through his conversion he had obtained absolute power. Directly he began his improvements, he not only found that the excellent organisation and method of Rome was unknown there, but that there was, too, a dearth of architects, builders, and foremen, and of that vast army of artisans which is wanted to build, decorate, and furnish a structure. In one brief he says:—"We want the greatest possible number of architects, but they fail us,* and he gives a list in another brief† of thirty-five master artificers who are to be freed from taxes if they come there and teach their sons. It may be interesting to hear the names of the professions and trades that were required. They were:—

Architects	Marble masons
Ceiling makers	Gilders
Plasterers	Founders
Carpenters	The next word is "blattiarii;" whether these were blackbeetle-killers, dyers of silk in purple, or goldbeaters, I must leave you to determine
Doctors	
Stone-cutters	
Silversmiths	
Builders	
Mule doctors	
Mosaic cutters	Tessilators
Gold embroiderers	Goldsmiths
Staircase hands	Mirror makers
Painters	Carriage builders
Sculptors	Levellers with the water-level
Filigree workers, or pearl-piercers	Glass-blowers
Intayers	Ivory-workers
Statuaries	Fullers
Mosaic workers	Potters
Braziers	Plumbers
Blacksmiths	Furriers.

Gibbon says, "The impatience of Constantine soon discovered that in the decline of the arts the skill as well as the number of his architects bore a very unequal proportion to the greatness of his designs. The magistrates of the most distant provinces were therefore directed to institute schools, to appoint professors, and, by the hopes of rewards and privileges, to engage in the study and practice of architecture, a sufficient number of ingenious youths, who had received a liberal education." (Gibbon "Decline and Fall," c. 17.)

The infusion of Romans and Roman methods into Byzantium must have given a Roman stamp to the new part of the city of Constantine's days; but most of the buildings he had erected were done in such haste and so badly, and were of such perishable materials, that time, earthquakes, and conflagrations soon destroyed them.

Zosimus (Lib. 2) says:—"As he expended the public treasure in unnecessary and unprofitable buildings, he likewise built some which in a short time were taken down again, because, being erected hastily, they could not stand long."

The proximity of the capital to Greece and to Asia Minor almost necessarily caused a great influx of Greeks and Orientals, anxious to make their fortunes, or to gain distinction in the new capital, and there can be no doubt that architects were included in this immigration.

We know that as early as the time of Trajan (98 to 117 A.D.) most of the architects employed in Rome were Greeks, for in his letter to Pliny the Younger, then Governor of Bithynia, he says:—"As there is no province that is not furnished with men of skill and ingenuity, you cannot possibly want architects; unless you think it the shortest way to procure them from Rome, when it is generally from Greece that they come to us" (Lib. 10, let. 49).

Constantine and his more immediate dependants, I presume, spoke Greek and Latin, though the language of Byzantium must, I think, have been Greek, as it had been a Greek republic before its conquest by the Romans. Greek was probably the *lingua franca* of those parts, for after Alexander the Great's conquests the kings of Asia Minor, Syria, and Egypt were Macedonians, and, though the Macedonian language was incomprehensible to Greeks, it is probable that Greek was the court language. One never heard of any Macedonian literature, and the brilliant, versatile, polished, and hungry Athenian, the *Græculus esuriens* of Horace, was almost sure to make his way to high posts. Athens in those days was like Florence in the Middle Ages; Pope Boniface the Eighth said Florence was the fifth element. We know that as early as the beginning of the second century B.C., Cato the Censor learnt Greek, partly, no doubt, to teach his son a language that was necesary for a nobleman to speak. In the first century B.C., the great Lucullus was equally familiar with Latin and Greek, and wrote his history of the Marsian War in Greek. Some scholars think that the celebrated "Et tu, Brute!" of Julius Cæsar, when he was stabbed, was said in Greek, and translated into Latin for patriotic reasons. Plutarch wrote his "Lives" for Trajan in his native Greek tongue; Martial also, in the first century puts Greek into the mouths of Roman ladies; in the second century the Emperor Marcus Aurelius wrote his "Thoughts" in Greek; and one of the charges against Maximinus the First in the early part of the third century was that he was wholly ignorant of the Greek language. The Emperor Julian wrote his Philosophical Essays in Greek in the fourth century, and Ammianus Marcellinus in the same century was the last Roman writer who used Latin. After him all the Eastern authors wrote Greek, until we read in the "Arabian Nights" of a man speaking Greek like a Roman.* The fact of Greek being the language of the lower Empire has caused many writers to call it the Greek Empire, and the Romans Greeks. It is not in my province to determine whether the Romans of the Byzantine Empire became Greeks in their thoughts and actions, but it is undoubtedly the case in architecture that the versatility and suppleness of the Greeks supplanted the rigid adherence to rule that so distinguished the Romans. Viollet-le-Duc and M. Choisy insist on Byzantine architecture showing strong characteristics of the Greek mind.

We saw last year in the Palace of Diocletian, probably built about the beginning of the fourth century, that the architect had begun to use arches springing from architraves, platbands, or blocks over the columns, and in one case even from Corinthian capitals themselves, showing that an important step had been taken towards the Byzantine style. M. Choisy believes that Diocletian's architect was able to dome the Temple of Jupiter without centering, so the art of doming must have made great strides as well, and, as it is stated that upwards of eighty domes fell down during Constantine's reign (306-337 A.D.), the architects must have been getting knowledge in the most practical way, just as the experience so gained in the twelfth century was used by the thirteenth-century architects.

Little or nothing remains of the buildings at Constantinople of Constantine's time. His baths at Rome have been destroyed, though we have Palladio's drawings of them; but the magnificent basilica of Maxentius and Constantine's baptistery, and the tombs to his mother Helena and his sister Constantia, as well as his Triumphal Arch, remain; and there still exists a church he had built near Prœneste, dedicated to St. Marcellinus and St. Peter, much after the fashion of the Temple to Portunus at Ostia. He is said to have had built in Palestine, the nave of the basilica at Bethlehem, and the dome of the rock at Jerusalem, over the supposed tomb of our Saviour, commonly called the Mosque of Omar. St. George, at Thessalonica, is believed, by some, to have been built in the time of Constantine; I believe it to be later. It is very much like the church of St. Marcellinus and St. Peter, only with a bema or sanctuary added. This I think is evidence of its being of a later date, though Constantine once proposed to make Thessalonica the capital of the empire.

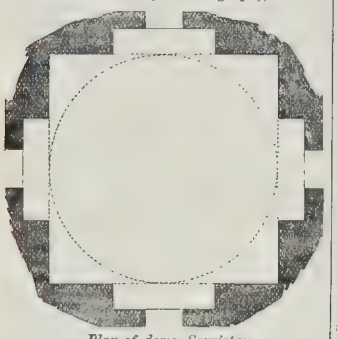
The most striking peculiarity of what we now call Byzantine architecture is the Pendentive, by means of which a circular dome may be erected over a square plan; and so distinctive is this of the style,—at least after the time of Justinian,—that M. de Verneilh takes it as the true test of Byzantine architecture in the West.

* "Codex Theodosianus," L. 13, Tit. iv. 1, A.D. 334.
† "Codex Theodosianus," L. 13, Tit. iv. 2, A.D. 357.

* The Romans of the Moslems were those of Constantinople.

All the architectural students know that pendentives are those portions of a dome that are left when the remainder is cut off by the vertical sides of a square, and form four spherical triangles between the four great arches that pierce the side of the square, that the diameter of the dome so cut is equal to the diagonal of the square, and that the joints of pendentives are more or less normal to the curve, for pure corbelling does not form a true pendentive.

The first mention that I recollect of early Western pendentives is in Texier & Pullan's "Byzantine Architecture," 1864 (introduction, page 9), where those in Caracalla's baths (211 A.D.) are mentioned. These were found in the one remaining octagonal hall, at the north end of the north-east apse of the enclosure; and, from a sketch M. Choisy has been kind enough to give me, the pendentives seem to be groined.* M. A. Choisy† also informs me he has no doubt that the pendentives found by M. Dieulafoy in Persian buildings were erected in the days of the Achæmenides. This dynasty began in the eighth century B.C., and was so called from a supposed ancestor named Achæmenes, and ended by Alexander the Great's conquest of Darius at Arbela in 331 B.C., or, at least, when Darius was murdered by Bessus (330 B.C.). These palaces with halls domed on a square plan have hitherto been attributed to the Sasanian period. The Sasanian dynasty began at the accession of Artaxerxes I. (Ardshire) in 226 A.D., and was so named from his father Sasan. I should mention that this Persian discovery or practice was not that of the perfect spherical pendentive, but may be called a pendentive partly supported on a squinch. A squinch is a stepped or conical vault, commonly called "bonnet-shaped." Circular domes on a square plan have been found at the Palace of Sarvistan (see lithograph), Ferouz-



Plan of dome, Sarvistan.

abad, and in a pavilion at Ferachbad, places to the south of Susa, or nearer to the Persan Gulf. (See "L'Art Antique de la Perse," by Marcel Dieulafoy, 4to., Paris.) As far as we yet know, the Byzantines were the first who threw aside the squinch, and used the pure spherical triangle as a pendentive, except the architect of that isolated example at Caracalla's baths. So numerous have been the invasions, that it is more curious that so much has remained than that so much has been destroyed. Still, it has rendered it impossible to follow the steps of constructive improvement, for, not to speak of the repeated inroad of Goths, Huns, Vandals, Lombards, Burgundians, and Franks in Europe, and the tide of successive Mussulman invasions, the destruction perpetrated by the hordes of savage Tartars under that monster Tamerlane, was almost enough to have destroyed every vestige of civilisation, for he swept over Asia from beyond the Ganges to Smyrna, and through Syria to the Holy Land, and this destruction only ended at the beginning of the fifteenth century.

You see how slowly great inventions spread: it was, at least, 300 years after its introduction into Europe before any attempt, that we know of, was made to use it on a grand scale. After the discovery of the use of the pendentive at so early a date as the fourth century B.C., it is scarcely necessary to cite examples before the time of Justinian, but the Marquis de Vogüé, in his "Syrie Centrale," gives illustrations of a little chapel, or kabylé, at Omm-es-Zeitoun, in Syria (see lithograph), of the year 285 A.D., which has a dome on a square plan, but this is built on corbelling much after the fashion of the tomb at Mylassa (see lithograph).

In 532 A.D., Justinian began the rebuilding of Constantine's Basilica of Sta. Sophia at Constantinople; this cathedral had been burnt down in a riot between the partisans of the rival charioteers. The colours used by the charioteers in the Roman Circus were white, blue, red, and green, but at Constantinople blue and green, called Venetus and Prasinus, seem only to have been used, the bulk of the people seems to have adopted one or the other of these two colours as a political as well as an ecclesiastical badge. The blues were the partisans of Justinian, the greens of the descendants of Theodosius, and as the blues were in favour of the reigning emperor, and believed in his orthodoxy, they considered that their zeal on his behalf should cover all their crimes and misdemeanours; robbery, murder, and arson were perpetrated by bands of robbers under the blue badge, and mostly with impunity. The father of the Empress Theodora was the Emperor Justin's bear-ward, and when he died, leaving his widow and three daughters penniless, the widow appealed to the "fancy" in the circus to continue the employment to her new husband, and thus to provide for her and her family. This appeal was received by the greens with contempt, by the blues with compassion; and they elected the new husband as their keeper of the beasts. Theodora and her elder sister were brought up as actresses, and her genius led her to be a comic one. After she became Empress she always protected the blues, and persecuted the greens. A riot took place at the conclusion of the games on the Ides of January, 532, and some of the rioters of both colours were executed. Thereupon the two factions joined, elected a new Emperor, and, after having burnt down about half the city, besieged the Emperor in his Palace. Justinian was about to fly, but by the remonstrance of Theodora and his general, Belisarius, he consented to remain, and allowed Belisarius to quell the riot, called the "Nika." Belisarius, Mundus, and Narses forced their way into the hippodrome where the people were crowning the new Emperor Hypatius, and butchered the bulk of them. Thirty thousand people are said to have perished in these riots. Forty days afterwards the site of the new Cathedral had been cleared, and the rebuilding was begun under the directions of two Asiatic Greek architects or mechanicians, Anthemius, of Tralles, and Isodore, of Miletus, from the model of Anthemius. The Cathedral to Sta. Sophia, Holy Wisdom or the Word of God, was completed by ten thousand workmen in about six years, and its cost is estimated at a million pounds sterling

You see by the plan that the nave consists of a square, over which is the great dome, with semicircular apses at the eastern and western ends of the square.*

On each side of the great apses are two subsidiary apses, and what we should call a "choir," projects from the centre of the eastern apse, but with the Byzantines the nave was the choir, and the choir was the sanctuary or bema. There are aisles on both sides of the cathedral, the middle parts of which form the transepts; these, however, are hidden from view by the screens of columns to the north and south, so that the cross is only apparent from the plan. In front of the cathedral there is a narthex, "the reed," so-called from its narrowness, and an exonarthex. The narthex was used by the Catechumens, or scholars not yet fully initiated into the Holy Faith, and by penitents guilty of backsliding, both of whom were not allowed to enter into the body of the church during the service.

It was a brilliant idea of Anthemius to employ pendentives on so grand a scale, and although the use of pendentives, as we have seen, was not novel, it was so to the unarchitectural contemporaries of Anthemius. Procopius, who had been the secretary of Belisarius, and was afterwards made a Senator and Præfect of Constantinople, has given some account of the building and appearance of Sta. Sophia. Speaking of the centre part, he says:—"As the arches are arranged in a quadrangular figure, the stonework between them takes the shape of a triangle, the lower angle of each triangle being compressed between the shoulders of the arches, is slender, while the upper part becomes wider as it rises in the space between them, and ends against the circle which rises thence, forming there its remaining angles. A spherical-shaped dome standing upon this circle makes it exceedingly beautiful. From the lightness of the building it does not appear to rest upon a solid foundation, but to cover the place beneath as though it were suspended from heaven by the fabled golden chain" ("Procopius of the Buildings of Justinian," Lib. 1).

This splendid discovery in the art of doming is, as I said before, considered by M. de Verneilh to be the distinguishing mark of Byzantine architecture in the west; besides this prime invention, many minor constructive improvements were made. The Corinthian capitals, which in Diocletian's Palace bore the arches directly on them, were no longer fit for carrying great weights when the pier carried by them was as wide or wider than the abacus, as the thin abacus of a Corinthian capital would have broken. A squatter capital was therefore used, mostly of a cup-like shape or a square, bevelled off into a circle, just as you see a pile bevelled to get on the ring. The capitals were not cut into deeply, but were mostly covered with surface ornament of the Byzantine Acanthus or of basket work. There are, however, capitals of the fifth century that have the angles carved in high relief, and old classic caps were used, but mostly with a block over them. We by no means find in Byzantine architecture the artistic perfection of the best period of Greek, nor do we find the majestic dignity of the Augustan period of Roman: the profiles want vigour and style, and the mouldings are also wanting in character and beauty, and too much resemble those used by a cheap marble mason to save labour and material. There is, too, in Byzantine architecture a lack of perception for the finest proportion. Though Procopius pays Sta. Sophia the following left-handed compliment: "It is distinguished by indescribable beauty, for it excels both in its size and in the harmony of its proportion, having no part excessive and none deficient; being more magnificent than ordinary buildings, and much more elegant than those which are out of proportion."

Where ornament is used, it wants that perfection of grace that Greek ornament had, though it is freer and more varied in design, and some of its acanthus-work is effective, elegant, and beautiful. The ornamental parts, however, are too frequently wholly covered with ornament of nearly the same weight. In the interiors of Byzantine buildings the eye is fascinated by the colour, the walls being wholly covered with beautiful marbles, often inlaid in superb patterns, and the domes and vaults with glass mosaic; in short, it was the decoration of the days of imperial Rome, only, instead of the ideal forms of beauty pourtrayed in gods and goddesses, heroes and nymphs, we have "grisly saints and martyrs hairy." Perhaps, too, the judgment is somewhat warped by the lovely materials employed. The outsides of early Byzantine buildings are mostly left to take care of themselves, though an inclination to this method was characteristic of the post-Augustan architecture of Rome, and is a favourite programme for obtaining excellence in the present day.

The later buildings, called by some "Neo-Byzantine," have always high drums to the domes; those that are octagonal and whose window heads cut into the dome are almost hideous outside, and contrast most unfavourably with the plainness of the earlier buildings; but for all this I think we may say that Roman architecture had at last logically advanced to a purely arched and domed construction, and had clothed that construction with a new system of moulding and of ornament, so as to form a distinct architectural style. In the present day, all the architects of Christendom are striving to find out what will take the fancy of the people. Each architect has so far mastered one of the bygone styles as to have rendered it flexible in his hands, so that he can mould the style to the wants and uses of the present day. (We get every past style admirably paraphrased, if we except Greek and the work of the sculptor architects of the early Italian Renaissance.) If the varieties of styles be considered, ranging as they do from a prehistoric architecture through the solid marble architecture of Greece, the veneered architecture of Rome and Byzantium, through the Saracenic, Gothic, and Renaissance styles, and

* The drawing exhibited was made for me by Mr. Watt.

† A. Choisy. "Les fouilles de Suse et l'Art Antique de la Perse" (extrait de la Gazette Archéologique de 1887). Paris, 4to, 1887.

* The plan and section of St. Sophia will be given in our next number.

their endless schools, this must be looked on as no small achievement. Still, we have to make the one step forward which will captivate the sense of beauty and æsthetic fitness that we think must be floating in the minds of the public, and thus lay the foundation of a new style, which our successors may improve upon and perfect. We especially want to give to the new materials employed,—particularly to iron, —some vigorous stamp of architectural beauty.

The late Mr. H. H. Richardson, of America, gave a Byzantine air to some of his buildings, and adopted or adapted some Byzantine forms and ornament, and some of you may have heard Professor Babcock's eulogy on the new Byzantine architecture of America.

It is not so much, however, as a style to be paraphrased, as a valuable study to be pursued, that I am drawing your attention to it, though if iron were eliminated there are few bye-gone styles that are so capable of being now used, and are in many respects so satisfactory. Byzantine buildings of the best age look internally stable, grand, and simple, and we are by no means bound to perpetuate the poor mouldings or semi-barbaric figures of Byzantine art; we want architecture, not archæology.

We see that the Byzantine architects and sculptors were full of resources, both constructional and artistic: the dome "pendent by subtile magic" on its four pendentives was a prime invention; I say invention, because, though it may have been known for centuries, no one had before dared to use it on a grand scale. We say wrought-iron girders are an invention of the nineteenth century, though they were used in the third century at Caracalla's Baths,—heavy abutments had to be provided to resist the thrust of pendentives, domes, and semi-domes. Many of the curious flat apses with which Byzantine architecture abound were made to that end, though flat apses had been used very much earlier. All sorts of ingenious devices were used to save centering and its shoring, as I shall show you, and when the capitals of columns were required to be large and heavy to support immense superstructures, new forms and new adaptations of ornament had to be used.

Mr. Ruskin and Mr. W. Morris have both been eloquent on Byzantine Architecture; the latter went so far as to say publicly that the interior of St. Sophia was, in his opinion, the most beautiful in the world; and Professor Lewis, in his preface to Procopius' Buildings of Justinian, says:—"Earthquakes and faults of construction occasioned the rebuilding of the great dome, but it still crowns, after a trial of more than 1,300 years, one of the most beautiful buildings in existence." I shall tell you what I think of it hereafter.

There is no recipe for invention, it is a gift; but when the elements of architecture have been learnt, there seems to me no better exercise as a preliminary to invention than studying how former architects adapted old forms to new wants, how they solved the new problems of construction that were forced upon them, and how they artistically treated those new forms, so as to bring them within the pale of architecture; nor a better study for sculptors than how to adapt the old ornament to the new forms, until they can invent new ornament for them.

Greek architecture was purely an artistic invention—the constructive principle was that of Egypt and Stonehenge. The Romans seem at first to have copied, as well as they could, the debased Greek architecture of their day, to have introduced such alterations as would make every part conform to a general rule, and to alter the æsthetic part so as to make it more in accordance with their coarse taste and love of magnificence. After a time the arch was found to be too convenient to be disregarded, and gradually superseded its older and more dignified rival, the lintel. As soon as vaulting came into general use the thrusts had to be counteracted, for even supposing that the vaults when set had no thrust, this was not the case when they were green.

You can see how the halls or compartments, in large vaulted buildings such as the baths, were arranged, so as to act as counterpoises to one another. When groined vaults were adopted, projecting piers were brought out at the angles of each chamber and plain arches sprang from them next the walls, so as to provide abutments for the diagonal thrusts of the groins; where groined vaults were used in an apartment higher than the rest, the lower part of the wall was abutted by deep walls and by vaulted recesses, but above these, where the outer walls were comparatively thin, buttresses were used, as in the case of the tepidaria of all the baths and the nave of the basilica of Maxentius. In the west, before the emergence of the Byzantine style, the half-domes of apses were abutted by enclosing them in solid half-squares, the angles of which acted as buttresses.

The walls of circular-domed structures were either of enormous thickness, or else the structures were made square outside to get abutments at the angles. We see no signs of any great organic advance in construction, after the invention of groined vaults, until we come to the Baths of Constantine, where the groined vaults of the building in front of the Laconicum are abutted by shallow apses without solid angles. We know too that as these great tepidaria of the baths wanted lofty arches to the recesses both for effect and light, the entablatures between the columns were consequently dispensed with, and the columns were merely shores with a strip of entablature above them to help support the groins of the vault. I say help, because the entablatures then became lintels. When the architect of Caracalla's Baths wanted to make his celebrated solar cell, *i.e.*, a covered swimming bath lit from above, he could not vault it, or he would have blocked out the light from the tepidarium, so he hit upon the original scheme of carrying the flat roof and ceiling by means of wrought-iron girders, forestalling the modern English invention by some 1600 years.

It is possible that at some future time, churches and cathedrals may be wanted whose plan and arrangements are adapted to the Protestant ritual. In the Byzantine churches we have every sort of plan that can well be imagined, circular, octagonal, square, trefoil, quaterfoil, cruciform, of many varieties, and of that form which the Byzantines called "in the shape of a circus," but which we call "in the form of a basilica," and these Byzantine churches might give hints for what is wanted for a true Protestant church or cathedral. Two storyed museums, picture and sculpture galleries may some day be wanted to show the works exhibited in their lower rooms instead of concealing them, and many Byzantine devices might give us hints how to do this.

The Byzantine churches were constructed of all sorts of materials. The walls mostly of stone, with a course of bricks between each stone, and the vaults and domes of burnt brick, and roofed in all sorts of ways from the common truss of perishable and inflammable wood to the permanent vault or dome. In Syria another form of roofing was used, *i.e.*, vast slabs of stone were supported on arches and formed the ceiling, and supported the rubble terraces that acted as roofs.

If we owed that Bulgarian peasant, Oupravda —afterwards called Justinian—a debt of gratitude for nothing else, we owe it to him for having Sta. Sophia built without wood, as well as for the excellent construction of the fortifications of the Castle of Edessa on the Euphrates, which have lasted to the present day. We, who are Londoners living in a brick district, naturally take the greatest interest in vaults and domes of brick, as we have the materials at hand without the expense of carriage from a distance, besides being more familiar with brick construction, not to speak of brickwork having a flavour of the locality. Vaults and domes naturally took their rise in treeless countries. The old proverb says, "Necessity is the mother of invention," and where good timber was not to be had, some other means of covering had to be devised.

We see how the people of Persia and Mesopotamia contrived to cover their buildings with vaults and domes almost without centering, from having no other means of roofing. Strabo (Lib. 16, c. 1, p. 5), speaking of Babylon, says: "Whence among the seven wonders of the world are reckoned this wall and the hanging gardens. . . . the garden consists of vaulted terraces, raised one above another, and resting upon cube-shaped pillars. . . . The pillars, the vaults, and the terraces are constructed of baked brick and asphalte," and, in speaking of the city, he says: "All the houses are vaulted on account of the want of timber. For the country is bare, a great part of it is covered with shrubs, and produces nothing but the palm."

Now and then in London we see a vaulted Church or a vaulted hall, but the greater part of our buildings are only walls with a wooden roof; even St. Paul's would present us with the lantern on a limekiln if the wooden dome were burnt, and the fall of the timber did not bring down the cone. Ware says "It is the roof that makes the house," and it is pitiable to think that a fire would reduce nearly all our great buildings to the state of walls, for most of the great vaulted constructions we simulate are built by us of lath and plaster. The great Ahmed-Ibn-Touloun showed his wisdom in forcing his Coptic architect to build his Mosque at Cairo of burnt brick, saying that every other material perished by fire or water. When we recollect what architecture does for a country we ought to insist that our national buildings should be built of burnt brick and vaulted with the same material, so that when our empire has passed away there may be remnants left of our former greatness.

You all know that I am a great advocate for the architectural use of iron, but under the destructive influence of fire iron is even more ruinous to structures than wood itself, and stone and marble calcine, or split to pieces.

The value of the past is in the priceless lessons it can give us for present use. The study of Virgil gave the world the Divina Commedia of Dante, and the study of the written masterpieces of antiquity the present literature of Europe; the study of the fragments of antique sculpture revived the sculptors' art, and gave dignity to painting. Even in the present day, the discovery of the ruins of an ancient civilisation may be fraught with wonderful and unhoped-for results. Look at M. Dieulafoy's discovery of the ruins of the Persian palaces! The magnificent enamelled friezes from the Palaces of Darius and Xerxes, that were found at Susa, have not only enlarged the minds of every visitor to the Louvre, have given an almost unique lesson in monumental colouring, but have also given a fresh impetus to that beautiful branch of art, enamelled pottery. All of the roofs of last year's Exhibition building at Paris were resplendent with colour, wholly due to the exhibition of those enamelled friezes. I do not grudge our gifted neighbours these well-earned trophies, of which they have made so excellent a use, but we cannot forget that it was the parsimony of our Government that prevented us from having them. Loftus began the excavations in that very mound some thirty-five years ago, and had to relinquish them for want of funds.

I will, however, return to my subject, and try and whet your appetites for learning more about Byzantine architecture. Though the Byzantines had become Christians, they by no means eschewed those sins which are denounced under the names of the "lust of the eye" and the "pride of life." When these sins were indulged in for ecclesiastical buildings, furniture, and dresses, they were supposed to be peculiarly favoured by Heaven. Procopius tells us that Justinian having ordered a church to be built at Jerusalem, in honour of the Virgin, required it to be "surrounded on every side with columns such as in beauty would be worthy of the main building, and of a size capable of supporting the weight that would be laid upon them," but from the precipitious character of the place such columns could not be brought there. He goes on to say that "while, however, the Emperor was grieving at this difficulty, God pointed out, for this purpose, in the nearest mountains a bed of stone of a kind suitable for this purpose, which either had existed there in former times, and been concealed, or was then created. Either story is credible." And he tells us that these columns were "of a colour that resembles flame." In addition to this new marble every splendid marble that had adorned ancient temples not only in Rome, but in all the Roman provinces, had been stripped from them, and conveyed to Constantinople to enrich the churches; glass mosaic was manufactured there; gold and silver, precious gems, and costly stuffs were given to the churches in profusion, and as the silkworm had been introduced into Constantinople there was no lack of silk. Procopius says in the Sanctuary of Santa Sophia alone there were 40,000 lbs. weight of silver, of which the iconostasis and furniture were composed. And Paul the Silentiary says: "In the circular part under the great dome was the Ambo, which was built of the rarest marbles, enriched with precious stones and ornaments in enamelled gold. This tribune, big enough for the consecration of the Emperors, was crowned with a dome covered with plates of gold enriched with gems; a great cross, ornamented with rubies and whole pearls, completed the decoration."

I think I have already said enough about Byzantine architecture to interest you in it, but I will say a few words more about Byzantium and the Byzantine Empire. Though architecture is our study, we cannot be altogether indifferent to those other fine arts which so greatly add to its beauty and interest; we must have some feeling of respect for the centre of an empire which was so long a bulwark against barbarism, and for that seat of art and learning from which cultivation was obtained: we can hardly expect architecture to be desired and appreciated by people who are wholly destitute of any feeling for the fine arts. Byzantium itself was a centre of all the arts, and though they did not flourish there as perfectly as at Athens in the days of Pericles, nor even as they did at Rome in the days of Augustus, yet the fine arts to a certain extent were there when they were extinct in the West. At Byzantium the traditions of antiquity were at least kept up, and in this way it was able to sow elsewhere the seed of artistic regeneration.

Byzantium supplied twelve thousand artisans for the construction of Walid the First's Mosque at Damascus between 708 and 718 A.D., and supplied him as well with the mosaic; it furnished architects and artificers to Charlemagne (771-814), and to Abd-el-Rahman the First at Cordova (755-787). Subsequently it sent architects to design and superintend the building of St. Mark's at Venice, and probably these same architects built St. Front, at Perigueux, and to its arts we mainly owe the Cathedral of St. Trophime, at Arles, and St. Gilles.

It was for many centuries a barrier against the devastation of the savages, and a bulwark against Mohammedan invasion, until it was left to its fate by the European nations through theological hatred. To the learned men it still cherished, to the codices of the ancient writers it preserved, and to the engraved gems, the basreliefs, and the statues it cherished, we mainly owe the great Renaissance of the fifteenth century, from which we are still reaping the benefits, and from the escape of its scholars before its last throes we owe the knowledge and study of Greek throughout Christendom.

THE ARCHITECTURAL ASSOCIATION:

WOOD AND STONE CARVING.

THE usual fortnightly meeting of this Association was held on Friday, the 23rd inst., in the meeting-room of the Royal Institute of British Architects, Mr. F. T. Baggallay, Vice-President, in the chair.

The following gentlemen were elected members,—viz., Messrs. E. R. Hudson, F. Foster, P. Hamilton, and C. F. Mitchell.

Three papers on "Wood and stone carving" were then read by Messrs. T. Stirling Lee, F. W. Pomeroy, and W. S. Frith.

Mr. Stirling Lee's Paper.

On receiving your kind invitation to read a paper before you on stone and wood carving, I felt it not only a great compliment but a source of gratification as a sign that the representatives of the arts of architecture and sculpture were growing more and more brotherly in their association, the result of which intercourse was already having very great beneficial results, and bids fair to place us on a road that will ultimately, I trust, create an art epoch in history.

I think no subject can be of greater mutual interest than the one chosen by you for discussion this evening, "Stone and Wood-carving." Certainly none is more occupying the minds of sculptors at the present time than this, the glyphic portion of our art, for it is that part of our art that schools and academies cannot teach and can only be acquired by practical experience, without which knowledge a man cannot rightly be called sculptor (or stone cutter). The divorcement of sculpture from architecture in England for many ages is, no doubt, responsible for so many of our sculptors devoting themselves almost entirely to the pastic portion of our art, for on looking at the buildings erected during the last generation (many of them public buildings) we cannot blind ourselves to the fact that the carving upon them is of the poorest and cheapest character, with the result, I think, we have all come to the conclusion that it is far wiser and more beautiful to keep to the simple grandeur of masonry than cover with meritricious meaningless carving at so much the foot-run. Let us think for an instant how all architectural periods have developed; how from simple blocks and masoned mouldings into carved capitals, friezes, figured pediments, and niches, and we recognise that it was the desire of thinking man to illustrate his thoughts in symbolic and figurative language, often the architect or head mason devoting his time to this carving, and decadence setting in on the desire for such enrichment without reason. No art demands to be more controlled by stern logic than that of sculpture. The very fact that it calls into play the faculty of imagination is sufficient cause that one should never forget the science that controls our materials. It was the neglect or ignorance of the limitations of their material that brought home to the French how far they had gone wrong and how meretricious their dancing exaggerated strain after movement was when executed in stone as architectural decoration.

I have already mentioned that carving must be controlled by scientific laws, that all stone enrichments must be geometrical, as the human form must, of necessity, have its anatomical construction correct. This fact brings home to us that carved work is but the highest form of masonry, enrichment by light and shade and balance of parts, all starting and contained within plains, beginning with its plain of work, and its depth governed by the amount of shade necessary to carry and keep it harmonious with the surrounding mouldings, in other words, to use a modern expression, to be correct in colour.

The Greeks worked so geometrically that they had set forms for different characters of figures, and the process of working is clearly shown by some blocks still lying at the marble quarries of Paria. The sculptor had sent a drawing of his work in planes. These were worked at the quarries to facilitate the raising and removing of the block, and also enabled one to judge of the quality of the marble, the name of which Lychnitie (light) gives the account of the way in which the quarry was worked by lamps; the geometrical methods of working stone explains why the Greeks had one word for mason and carver, λιθουργός, and how often the mason rose to be a figure sculptor, and it comes clearly home to all carvers how necessary is the ground-work of a knowledge of masonry. The more he knows, the greater his experience, the greater amount of knowledge will he put into his geometrical forms.

Let us now consider upon what lines the carver proceeds to enrich these forms. We have stated that his work must be in keeping, in style, and in harmony with the light and shade effect of the surrounding mouldings. It is the effect of things that is revealed to us through the eye, not lines only, but the result of lines with light and shade. To impress pleasant and grand effects it is necessary to obtain that result by treatment of light and shade. How beautiful and subtle is this study of light and shade in carving and full of interest, for by it we can read and understand the climate and atmosphere of countries. As atmosphere governs the effects of objects, so we understand the different treatments varying in character according to the aspect in which the work was situated. So proportions, mouldings, carving designed for Egypt, Greece, Italy, become unsuitable for slavish copying in England, and poor London. And how wrong one may go in working away from without studying the ultimate position of your work *in situ*. You will understand me to mean that all carving should be executed *in situ*, and whenever possible I certainly advise one doing so. When not practicable, as may often be the case, for instance, when the figure is introduced, and the study of drapery, it is as well to make a shade drawing on the spot with the principal lines, carving in the lines of the building, then make a sketch with the surrounding moulding in plaster, colour the whole with clay water, executing the work as far as possible in the light in which the work will ultimately be placed. Let us take for example a reredos or altar: it cannot be modelled or carved *in situ*, yet what requires more study? Often the only window by which it is lighted is one behind and above the work; execute it by the ordinary studio light, when placed, the whole work may become a nothing. I may mention one instance in which this was the case, nothing of the carving could be seen, so that the background had to be cut away, and a different-coloured marble inserted, to make the figures stand out by contrast of colour. Yet the law which governs relief is, the deeper the shade the lower the necessary relief, and the stronger the light the higher and bolder the work, so that when you have a sunny, southern aspect, sunlight playing into your shadows, your work will only tell by undercutting. I trust that I have made myself clear in showing how essential and how great a part the study of light and shade becomes as well as flow of line.

I wish to say a few words here on quality, or what is generally understood by tone. This depends entirely on the cutting of your material. I do not think that I can illustrate it better than by colour. Take an isolated pigment—it is crude, and it is by the painter's faculty for colour will his work be rich and full in tone or quality, so it is with stone, its rich fulness of colour depends entirely on the carver. Take a man sniggling at his work, smoothing, rasping, sand-papering, getting what is generally termed a high finish, yet his work is lifeless, toneless, and quite devoid of quality. A good carver knows how necessary it is to cut with as clean a cut as possible, each cut full of perfect knowledge and meaning and complete in its cutting, for by so doing he brings out the richness of local colour of his material and his work more durable by closing the grain to the deleterious effects of atmosphere.

I wish to say a few words on subjects. How often has one been carried off to the museums and some style of by-gone ages pointed to to copy; have we not sources of inspiration and design as all the ages gone before; have we not now animals, birds, fish, flowers, human beings as they had in Greece, Italy, and England in thirteenth and fourteenth centuries; have they not the same symbolic meaning now that they always had; are they not as beautiful as they always were? Let us see nature with our own eyes and tell our own thoughts, and, in a short time, you will have, if the opportunities are given, men as great carvers and thinkers as have ever been; one may say it is a question of cost. In my own experience I know men who have done architectural work at little above the cost, and are as enthusiastic as in the age when men joined brotherhoods to be able to spend their lives carving out the work of love in decorating the churches, opportunities we have seen given to the carving-shops that would have gladdened the hearts of Pheidias, Giotto, or Donatello,—give men the opportunity, and they will raise schools of workmen capable of doing the highest at the same cost as at present and turn your stones into a rich harvest of beauty and thought.

Mr. Pomeroy's Paper.

Nothing is more remarkable in this so-called age of science than to observe the manner in which Art in all its branches has become the fashion in these last years of the nineteenth century. To talk of art, to admire art, to write about art, sometimes with knowledge, how often without! To practice it as an amateur, and sometimes to purchase its products, is, in the present day, to be very decidedly in the fashion. That art should have in this way so seized upon the popular taste, for a moment, possibly, let us hope permanently, is a sure and direct testimony to the fresh energy and vitality which is being displayed in all its branches. In strife there is life, and out of the multitude of cliques and ideas, from the struggles of schools after independence and originality, there results a genuine enthusiasm, which, often misdirected, yet occasionally tends to the production of works of real excellence.

This vitality of art, which by its many-sidedness, has conquered the bulwarks of fashion, is not found in any less degree in the sculpture of our day. It is the custom nowadays to speak and write of the new English school of sculpture, as a discovery of the moment. So in a measure it is; but even in this young school there are sects and divisions. The conventional sculpture of the beginning of the century, with its pseudo-classicism, its insipid beauty, and its false idealism, is rapidly becoming a thing of the past. In its stead we have springing up around us two or three more or less distinct classes of students in sculpture. There is the student who has learnt only to model in art schools, and whose mind does not soar beyond the perpetration of a portrait bust, simply because he has had no training in the realities of his craft. Then, of course, as in painting, so in sculpture, we must have our impressionists, the seekers after originality, rushing to the opposite extreme from rules and conventions, rejoicing in mud-sketches devoid of form, full of sug-

gestiveness, perchance, but absolutely lacking the first essentials of good carving,—beauty of outline and drawing. Forgetful they would seem to be of the fact that, whether their material be clay, marble, or bronze, complete incompleteness can only be true, if after the manner of some of Michelangelo's works it consists, not so much in blurred lines but in the suggestiveness of masses, cut with severity and strength, and chiselled or modelled, if only in a sketchy manner, yet with absolute truth to rudimentary form. Last, and, perhaps, most important of all are the body of carver modeller's men who have received a thorough *craftsman's* training, who acknowledge the leadership of such men as Armstead, Thornycroft, Gilbert, and Ford, and the vitality of their principles, as received from the great masters of the past. These are the men who recognise that sculptors' work is bound up with that of the architect, and that in the future it is in the highest degree desirable that he, the architect, should endeavour to carefully select his sculptor and give him a fairly free hand in carrying out his work.

That the views of these men, which are indeed my own, with regard to the relations of sculpture and architecture, will be proved right by the work of the future, I feel assured; and I am all the more certain of this when I look back on the history of art, and see the close connexion between the two branches in the past. Neither space nor time will allow me here to sketch out, in evolutionary order, a history of decorative sculpture, but with all due honour to the antecedent glories of Egypt and Assyria, I should like here to touch slightly on the three great schools of the Greek, the Gothic, and the Renaissance, to note their characteristics, their independence of thought, their grasp of their material, and the close connexion between designer and decorator, between architect and sculptor, both of whom must have been artists, not mere workmen.

First, then, with regard to the Greeks, what where the conditions under which these artists in stone spent their artistic life? Dwellers in a beautiful climate, in a land of sunshine and blue sky. Worshippers in temples from the very simplicity of their construction eminently adapted for simple and beautiful decoration; for them, perhaps, it was easy to reach the high ideal. To them religion offered no intellectual problems; to live was to worship. The beauty of life, the beauty of existence, the ideal of beauty, the perfect human form, they had but to execute in stone that which they saw around them. To this work their artistic genius brought full aid. With ease and consummate mastery do their craftsmen conventionalise with a beautiful truth the simplest forms of nature. In their hands vegetable forms are for the first time rewoven into lovely and endless designs, and the human form, always beautiful, ever dignified, is placed in its right niche, takes its right position, on pediment, or frieze, with a knowledge of the due relations of the light and shade, of the structure and its decoration, which evolved, as it may be, from the Eastern nations, and, transmitted from one craftsman to another, seems in its completeness little short of heaven-born.

With Gothic sculpture a change has already passed over the world. Intellectual and religious problems are beginning to get hold of the artists. Religion and art are no longer one in simple worship of beauty, and the Deity expressed in beautiful existence. Art is now the servant of religion, that religion of Christianity in which mercy is greater than justice, but in which the blindness of man has made justice and judgment outway mercy. With what result? The fear of judgment has produced superstition, and superstition has enslaved art. The artist dwellers in Northern and rude climes, are haunted with visions of the devil; to them the unknown and the terrible speak of the powers of evil. Possessed with this fear, anxious to propitiate, the craftsmen with their infinite and intricate skill, fellow-workers of the architect, turned their great gifts, now to the grotesque, now to the hideous in stone, now to the stories of Christianity, with a fidelity in which truth comes before beauty; and now to the foliage forms of nature with a skill and an invention which have given us the most varied and exquisite designs, and have immortalised the stone-carvers of the Gothic arts as artists of ability, equalled only by the genius of those architects under whose liberal supervision they worked.

In England, it is interesting to note that while Nicholas da Pisano was working out the revival of ornamental decoration in Italy, our own craftsmen were winning for themselves a high place in contemporary art. As a specimen of our English gothic, Wells cathedral, built by Bishop Jocelyn, will compare favourably with larger structures in the beauty and exquisite character of its carvings. With regard to it, Flaxman says, "There are many creations of the Almighty creating Eve, but this is certainly the oldest, and is not inferior to the others; in parts there is a beautiful simplicity, sometimes a grace excelling more modern productions." That it was executed by Englishmen there is little doubt, and it is curious to observe that the cathedral possessing such beautiful works, was finished in 1252, the year Cimabue, the reviver of painting in Italy was born, thirty-six years before the cathedral of Orvieto was begun, and forty-six years before that of Amiens in France.

In France Gothic art flourished with its greatest strength,—this probably owing to the protracted Roman occupation, and the consequent continued importation of Greek and Roman artists into the country, who started an artistic tradition of sculpture, and the native mind became saturated with the carver's art. A magnificent crop of Gothic art, culminating in Rheims Cathedral was the immediate result; but the consequences were more far-reaching. The roots struck deep in the people's life, and France has ever since remained, with her traditions and her examples, the happy land of sculptors to the manner bore in age succeeding age. The traditions of the old artist carvers, who wrought with consummate skill on portal, on altars, on tombs and tabernacles, have been handed down from generation to generation. The muster-roll of famous names extends from Germain Pilou, Jean Joujou to Rude, Barrias, Dubois, Rodin, and many others, whose works have placed La Belle France at the head of artistic nations at the present day.

In Italy, except the northern part, the Gothic had never a firm footing, the influence of the Græco-Roman always being in the ascendant. Nicholas da Pisano, the first sculptor of eminence, undoubtedly was inspired from old fragments of Roman urns and bases that abounded in the country.

But it is in Italy that the third great school of sculpture which I wish to mention, "the Renaissance," reached its fullest glory, stamped its mark upon the world, and has in modern art a greater influence than either of the beforementioned schools.

By this time thought was emancipated, the sculptor free from the fetters of superstition, and conscious of something more than the religion of beauty, strove to add to his work ideas of character, of mind, of individuality of his subject, in addition to the charm of beauty. His mind sought to produce in his material ideas not only of beauty of appearance but of beautiful thoughts, true types of character, earnest definition of mental qualities, yet with due reference to the right methods of artistic conventionality.

At the same time he learned to give that true appearance of form, its charms and dignity, and likewise to preserve the thousand accidental graces of real human beings. Not only in their ideas did these artists excel, but also especially in their technical excellence; and in their treatment of low relief they have achieved their greatest triumphs; they realised that in a good low relief the head must often project more than the other parts for the sake of effect. In their works, parts are flattened and nearly obliterated to reduce light and shade, and give effect of distance; little trenches or grooves are cut into the background where greater definition is desired; in short, the work becomes like the painters, an effect of light and shade; and the greater subtleties exercised the more charming the effect.

And the lessons which they discovered for themselves, in low relief, the Renaissance carvers carried into their works in the round. No rude effects of black and white, but a delicate harmony of tones—nothing quite made out, the hollows not quite so deep, the projections not quite so high. Among the casts at South Kensington Museum beautiful examples of their art may be seen. Thus, in the statue of St. John the Baptist, from Siena, by Donatello, the arms and some parts of the drapery are flattened quite in the manner of a relief; but this paleness of treatment (if I may use the term) is not allowed to be an excuse for slovenliness or want of power in drawing; there is no lack of finish, everything is wrought out with loving care, and cut to the highest perfection.

Mino da Fiesole, Donatello, Verrochio, Settignano, and others, whose very names call up sweet visions of grace and beauty, were all architectural sculptors in the true sense of the word.

My object in drawing attention to these three schools of sculpture, whose artists are the models of our great workers of to-day, has been to show that nearly all the work was intimately connected with architecture, and if we are to have a School of Sculpture there must be no foolish distinctions We must understand the limitations and the extent of our material, the application of design to given spaces, the effect of work seen from a distance, and that systematic labour, and "infinite capacity for taking pains that is only to be acquired in early youth."

Mr. J. D. Sedding, in his charming paper on Embroidery, in the Arts and Crafts Catalogue of last year, has struck the right chord when he speaks of the poverty of the designs, and it applies both to embroidery and to carving; but we are weak because we are so trammelled by the reverence that architects have for the archæological side of their profession. How can they expect to get good designers when, if we attempt some new version, we are confronted with the everlasting word *style;* some bit of old work is promptly quoted or shown to us, and if our inventions do not correspond in every particular, we are told that it is much safer and better to copy the old models than originate new designs. Consequently, the carver who wishes to live long and see good days chokes his imagination (if he has any), and becomes nothing but a copying clerk in stone.

This is the reason of the chilly monotony that runs through modern foliage ornament, and it is anything but cheering to find, year after year, presented to our eyes, compositions from which the true spring and ever-varying detail of nature is conspicuously absent. Mr. William Morris is one of the few designers who, with a laudable independence, has dared, and successfully so, to strike out new departures in design.

All art must be seen through the temperament of the artist, whether he be architect or decorator, and if he is one naturally gifted with some special aptitude, he perceives the germs of beauty that exists in the external world, and by his creative power gives new life to the idea in the material which he uses; in short, he thinks in his material.

The most complete training in the theory of art will not enable a person to produce much; but the influence of a cultivated mind is always seen and felt, and the architect who takes the time and trouble thoroughly to supervise all his details, creates that interest and spirit of enthusiasm in the craftsmen, that is necessary for the production of all good art work. Let us throw off the shackles of half-dead conventionalism; for now we only conventionalise on the conventional, and let us spend some of our time in studying the many beautiful trees and plants that abound in our country, bringing all our attention to bear on them, as the sculptor does when he turns his attention to the human figure, making careful studies of selected portions. So that we may be real without being realistic, for realism is not design, and we shall learn more of the true nature of folial ornament in one short summer than by years of laborious copying from old casts.

Mr. Frith's Paper.

By wood and stone carving I understand that part of sculpture usually employed in conjunction with architecture, and which practically all architecture uses as one of the means by which its effect is obtained.

Why carving has received this universal and continuous sanction is a matter of considerable interest to both architects and sculptors; for in this, these arts are most intimately in contact, and the interlacing of one with the other is practised. Wherever architecture in any form exists there also is found its attendant carving. As the reasons for this are most probably appertaining to architecture, it is no doubt becoming in the sculptor to approach the question with proper modesty.

I think it does not affect the building side of architecture, but the æsthetic,—that which deals with the growth of one part from another, and the placing together of harmonious forms. And

it thus groups with the design the arrangement of mouldings and those parts of architecture which, while being unnecessary for purposes connected with stability, are yet required to gratify the eye and mind by satisfying an aspiration for reasonable and beautiful structure and form,—which is as well founded a requirement for the æsthetic comfort as conformity with the laws of gravitation is for the physical.

Taking the instance of the capital, the requirement is not so much from the building point of view; but the form and treatment this feature receives is rather due to the endeavour to give at this point the emphasis felt to be required, while at the same time showing a pleasant growth of one part into the other.

Carving is a part of the general scheme of proportion, form, light and shade of the building, which being carried on through the scheme of mouldings, is emphasised and punctuated by the carving: the same faculties are called into play in each, and knowledge in one can no doubt be readily applied to the other; the distinction is that while mouldings give straight or continuous lines or curves, carving gives broken masses of light and shade and patches of texture, and gives interest to required parts, and that while mouldings mainly consist of the working-out of prescribed curves and surfaces, carving invites the treatment of form of a freer nature. It has also the advantage of the appearance of the thought and its expression being presented together, and in the drift of the tool presenting a charm as showing actual cuts expressive of active thought guiding their production. By giving an approach to the representation of nature, it catches the eye and rivets the attention in a manner that form other than that suggestive of natural objects does not.

The possession of this means of effect, in addition to form more or less geometrical, provides, it may be said, a fuller palette to the artist than mere geometry or masonry would supply, and assists him in that grouping, connecting, and accentuating of effects which is necessary in all art, and which brings about that singing together of parts which we call harmony. It provides the architect with a variety of forms graduating from those little different to masonry to those in which form may be treated in the freest manner that nature or art can sanction.

Where carving shall be rigid, where less retrained, and where freedom can be given, and to what degree, is the essential artistic question; but who shall prescribe in this matter? To lay down laws in art is no doubt useful to students, but the artist usually forgets them.

With reference to this receiving sufficient consideration, I think very much greater attention should be given to it than is now the rule, and that so essential a matter in design might receive a more distinguished place than it at present holds. The ornaments that have been used for the last few centuries might have a rest, and some attempt at real design be made; it is no doubt best to keep to those things which have been proved successful in the past until we get something at least equal in the present; but, while waiting for this, we continue to carve prescribed forms, and the question of original design is neglected.

The mine from which previous motives for design have been drawn is surely open yet; and the wealth of nature not yet exhausted. In, however, our studies from nature, it has to be remembered that a purely imitative, realistic representation carries the mind of the observer through the imitation to the object represented. With a photograph, for instance, the attention is given to the person or scene presented, the photo, if good, escaping attention. In carving, however, we do not wish the conception to be entirely of the object represented, but rather for the attention to be held awhile by the building. This supplies one reason for conventional treatment; another consists in the fact that natural forms like leaves and flowers, which bear small lights and shadows and thin edges, require considerable treatment to make them seem in any way to belong to the building. And some ages have concurred in thinking they should be in some degree (certainly various degrees) conventionalised. I am not at all sure whether, in this respect, the Assyrian reliefs, in the suggestions of treatment they offer, are not in parts superior to the Parthenon frieze. Of course the position occupied and function performed by the carving has much to do with this matter, and for some positions or purposes absolutely realistic work may be best, though this, I think, occurs very rarely.

One important rule in the application of carving is, that when completed the architectural features around shall have increased in value. I recall an instance of a man who designed and carved, and beautifully carved (as far as cutting most difficult stone goes) some ribbons and flowers over a door, with the result that you could not look at the doorway, because of the little black holes in the carving which dazzled the eyes. This was owing to lack of knowledge in light and shade; if the black holes gave greater contrast, and in sum an effect overpowering that afforded by the grey shadow and the light on the mouldings, the carving must start forward and the general effect be injuriously disturbed.

With reference to wood-carving, the adaptability of the material has, I am afraid, led to the loss of much of its distinctive character, which in the hands of an artist would be capable of wise and fruitful use. Anything can be carved in wood; which is probably the earliest material used for sculpture. The questions however arise whether works having great thought and labour expended in their production should be rendered in a material so easily destroyed; whether works depending for their effect upon subtle gradations of light and shade are suitable for this material; and whether the basis for wood-carving should be the imitation of stone or marble work. The wood-carving of the Perpendicular period occurs to me as being suggestive of the direction in which much could be accomplished in design. The simplicity of the means by which beautiful effects can be obtained, the great variety and the freedom with which these effects can be rendered, and the perfect display of the silky surface of the wood, commend this treatment very strongly. The Indian wood-carving also is worth attention, from the way in which the rich colour of the wood is used as an important factor in the design. That wood-carving which aims at the production of form alone, as it necessarily ignores the material, is probably best considered as wood-sculpture, and would thus conform to the general rules governing sculpture, whether in wood, stone, bronze, or marble. In every case the study of light and shade, of the beauty, variety, and fitness of form for the purpose to be fulfilled, together with a knowledge of the qualities of the materials in which these are to be rendered, are the operating means by which the full value of the contribution obtainable from carving can be realised, for the performance of its office of completing and giving point to the effects of the beautiful art of architecture.

Mr. T. E. Pryce, in proposing a vote of thanks to the readers of the three papers, said the subject which had been treated that evening was one which strongly appealed to all architects who had had anything to do with getting carving done. It was not until they came to superintend pieces of carving that they really discovered the extreme difficulty there was in finding a man able to do the work. The longer they worked the greater difficulty they found in carrying out a building that, while satisfying the eye in its proportions, was satisfactory in its smaller details, as a building properly decorated, with really good and artistic carving, did. It had always struck him that the carving in a building, particularly a large building, was a sort of gem enclosed in a setting. First of all, a building was a thing that should be pleasing in its proportions; the mouldings should be graceful, and the plan and elevation and everything in connexion with it should be pleasing to the eye. In looking at the inside of an old building, one was first struck with the general view; but, on looking at it in detail, one was often struck with the beauty, or want of beauty, in the carving that decorated naves or other portions of a building to which the carving might be applied. It always seemed to him, putting on one side figure sculpture, that the reason for the existence of carving in a building was that it should form the beautiful touches that gave life to the whole. With regard to the papers which had been read that evening, he agreed with almost everything that had been said upon the subject of carving, but with regard to what Mr. Pomeroy had said about art being in "the fashion," he (Mr. Pryce) sincerely hoped that, like other fashions, it would not die out in the course of a generation. With regard to what he understood Mr. Pomeroy to say as to the carver's art and the builder's art being trammelled with superstitions during the Middle Ages, he did not think that statement was quite correct. It had always seemed to him that the carver and painter of the Middle Ages was very often really a free-thinker. He could not say much by word of mouth, but he could with brush and chisel. With regard to the wood-carving of the Perpendicular period, he did not think anyone could fail to be struck how truly the carvers of that period realised the capabilities of their materials. With regard to the future of carving, he sincerely hoped that a school of carvers would spring up, untrammelled by the examples of the past. He thought everyone would most gladly welcome the arrival of such a school.

Mr. H. O. Cresswell, in seconding the motion, said he thought it was a matter for congratulation that they had been able to induce three gentlemen like the readers of the papers to come down and give them the benefit of their advice and experience with regard to carving. He hoped that architects would be able to meet sculptors, painters, and other art craftsmen for the discussion of such subjects more frequently than had hitherto been the case. One great difficulty with regard to the use of carving, especially externally and in such smoky cities as London, was that before the carving had been very long executed, its effect was seriously interfered with by the accumulation of soot and dirt. How far carved panels, &c., might be sheltered by projecting mouldings or strings he did not know. Of course, they all admired those very beautiful examples of Donatello and other great masters of the Italian school to which reference had been made, and he thought they all agreed that sculpture, when applied to architecture, was generally most successful when it was formal and not too free.

Mr. F. R. Farrow said he had very great pleasure in supporting the vote of thanks. He thought that the three papers which had been read were amongst the most profitable and useful that had ever been read before the Association. Anything that would tend to bring about an improvement upon the class of work turned out by their old friend the average "architectural carver" was to be warmly welcomed. He agreed with Mr. Pryce in hoping that the present feeling in favour of art would not be a mere fleeting fashion, and that we should no longer go back to archæological precedent for everything that we did. Good work could only be secured by leaving something to the imagination of the artist who executed it. We had had several archæological revivals in the modern history of architecture, but they had all died out, simply because they had been merely archæological and the work of *dilettanti*, who had been content with copying what other men had done. He cordially endorsed the views of Mr. Frith with regard to the wood-carving of the Perpendicular period, and he could not help contrasting that work with the very different class of work which was so much admired by the general public,—he meant the work of Grinling Gibbons and his school. To his mind the work of Grinling Gibbons, marvellous as it was in *technique*, was base in art; indeed, he did not think there was anything worse in art than the carving of Grinling Gibbons. Having made reference to a paper read some years ago before the Association by Mr. Redfern, which, he said, was well worth reading, Mr. Farrow said in conclusion that much good would result to the sculptural decoration of our buildings by more frequent consultation between the architect and the sculptor.

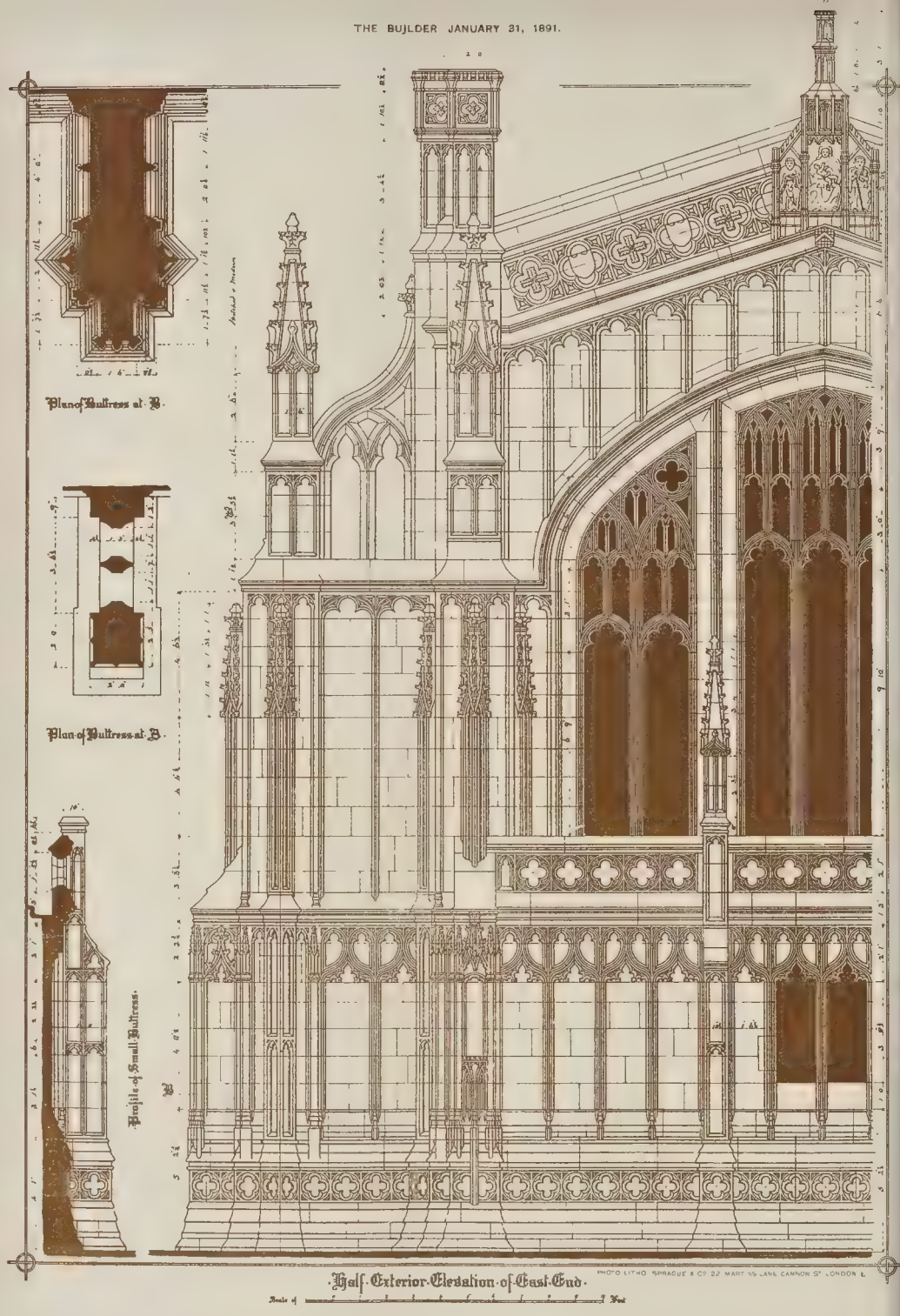
Mr. Brodie also supported the motion, and said he agreed in thinking that one of the most promising signs of the future of architecture was the growing intercourse that was taking place between architects and craftsmen. He instanced the work of Mr. Collcutt as exhibiting ornament profitably applied to architecture. In conclusion, he expressed the hope that not only would architects show an increasing desire to leave the execution of their sculptural decoration to the sculptor, but that the sculptor himself would descend from his high pedestal, and instead of being content with producing busts which were of no interest, would don the blouse and execute the sculptural work of our buildings.

Mr. Moore having said a few words, in the course of which he was very sarcastic as to a



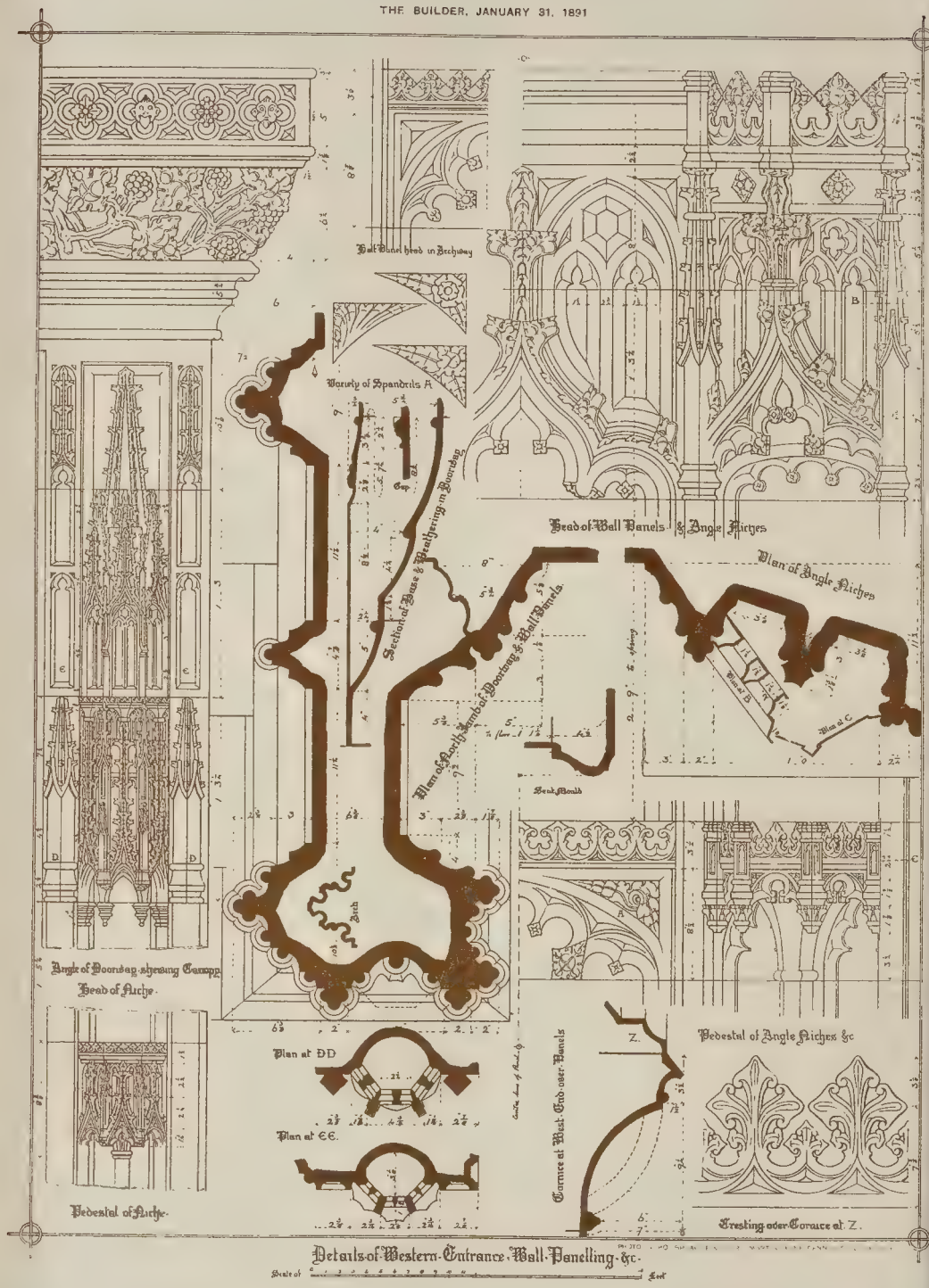


COMPETITION DESIGN FOR CONGREGATIONAL CHURCH, WEST KENSINGTON.—Messrs. Potts, Sulman & Hennings Architects.



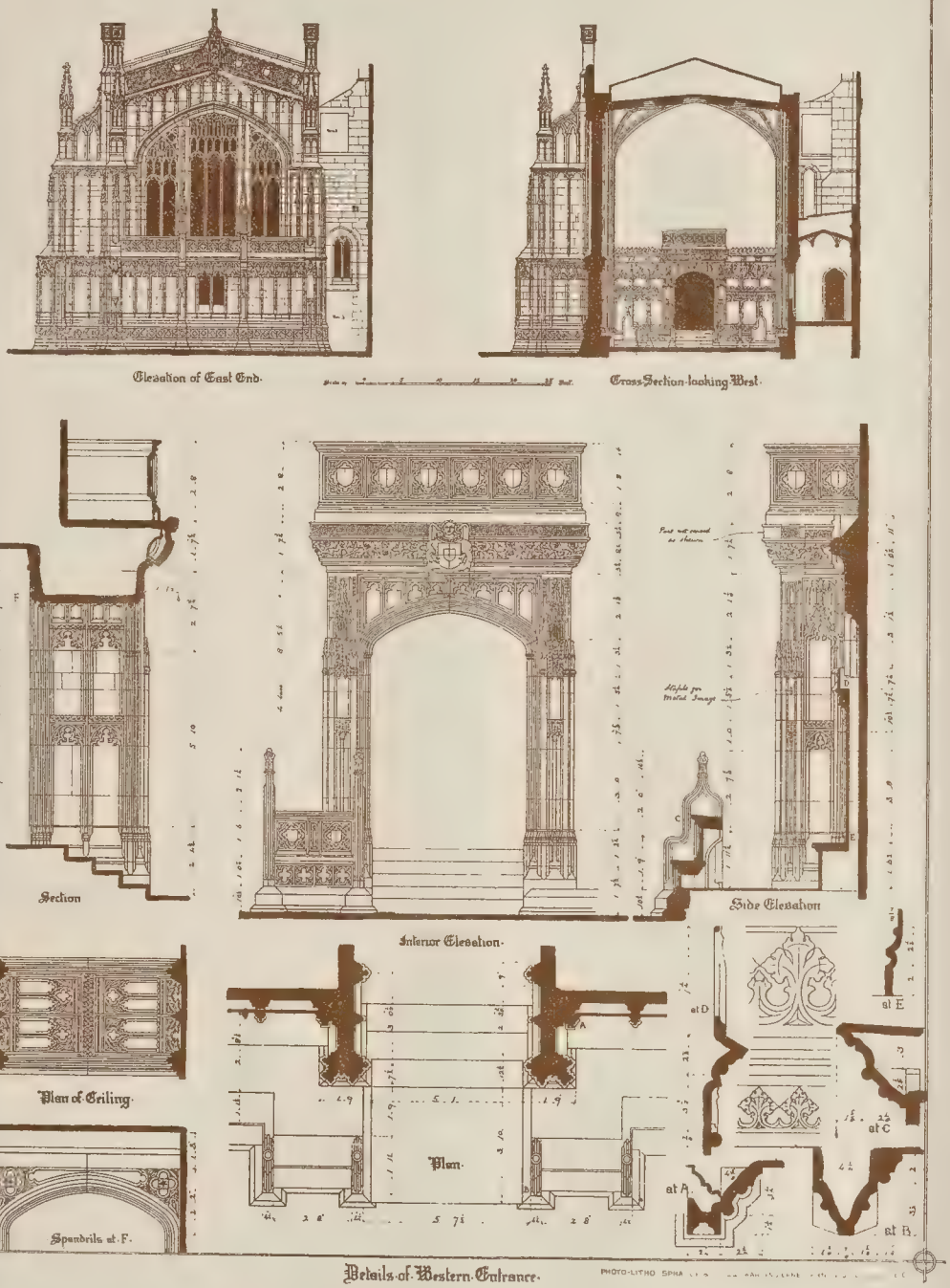
THE BEAUCHAMP CHAPEL, WARWICK.—Measured and Drawn by Mr. Harold Brakspear.

"Honourable Mention" for Institute Silver Medal, 1891.



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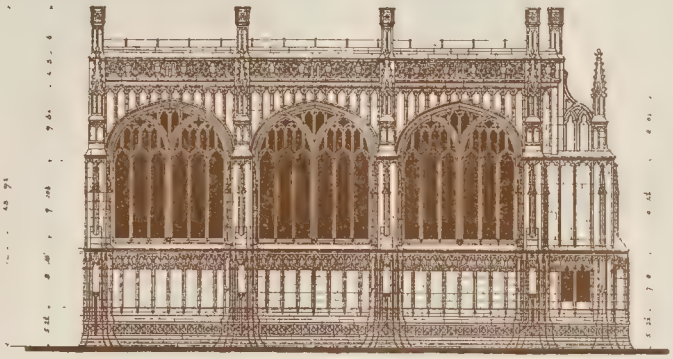
"Honourable Mention" for Institute Silver Medal, 1891.



Escutcheon to Door at A



Escutcheon to Door at B.



Elevation of South Side

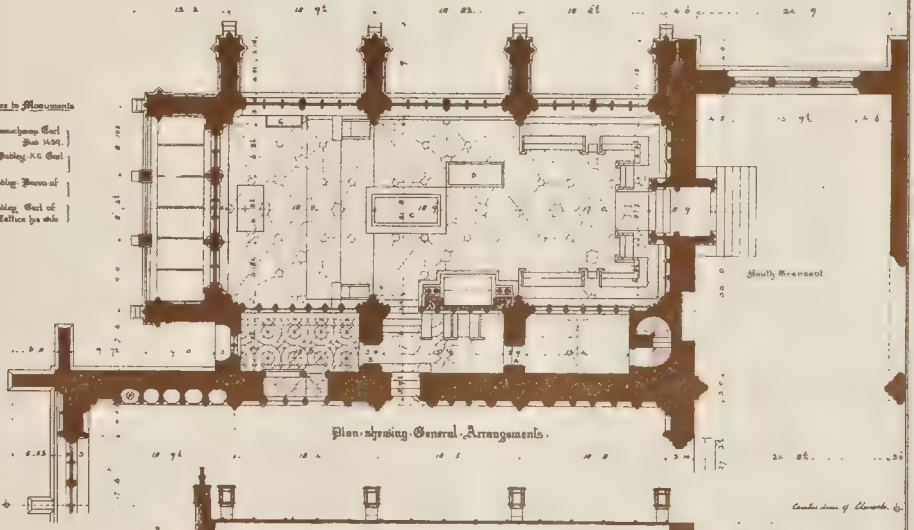
References to Monuments

C Richard Beauchamp Earl of Warwick Died 1439.

D Ambrose Dudley. K.G. Earl of Warwick

E Robert Dudley. Baron of Denbigh

F Robert Dudley. Earl of Leycester & Lattice his wife



Plan shewing General Arrangements.



Longitudinal Section looking South.

Note

The Chapel was built by the Dean of Holy Beauchamp began 1443 the cost amounted to £2481 & 7½ & was consecrated 1472 by John Scales Bp of Coventry & Lichfield.

The Choir was built by the Dean of Bp Beauchamp about 1370

The rest of the church was built by Sir Chas Wilson in a debased style about 1703.

Bloxham Wat Churches

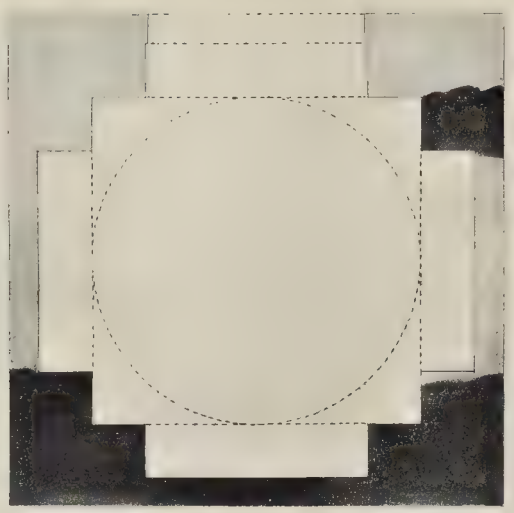
Scale of 0 5 10 15 20 25 30 35 40 45 50 Feet

THE BEAUCHAMP CHAPEL, WARWICK.—Measured and Drawn by Mr. Harold Brakspear.

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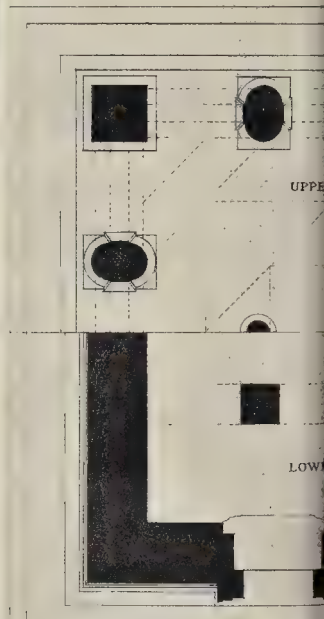
PENDENTIVE, SARVISTAN.



PLAN, FERACHBAD



SEPULCHRAL



BYZANTIN

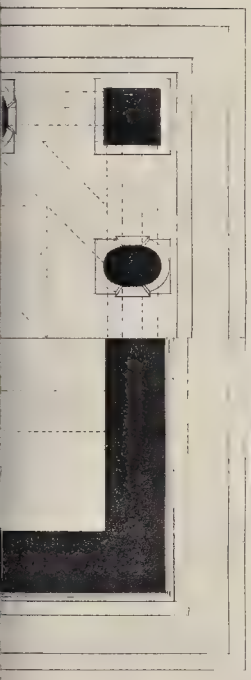
ILLUSTRATIONS TO PROFESSOR AITCH

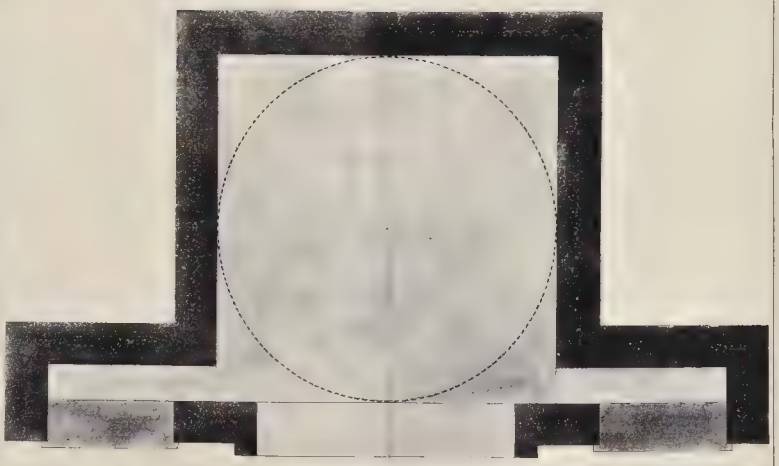


MYLASSA.



DETAIL OF CUPOLA, OMM-ES-ZEITOUN.





PLAN, OMM-ES-ZEITOUN.

certain class of architectural carvers known as "field-rangers,"

The Chairman in putting the motion, said he quite endorsed all that had been said as to the advantage of closer intercourse between architects and sculptors. And on the general subject he thought that they were very much indebted to the readers of the papers for their kindness in giving the Association the benefit of their experience.

The vote of thanks having been carried by acclamation,

Messrs. Stirling Lee, Pomeroy, and Frith briefly acknowledged the compliment, and the meeting terminated.

Students' Dinner.—On Tuesday, the 20th inst., a large number of the junior students of the Association dined together at the Piccadilly Restaurant. Mr. Arthur W. Earle, who presided, appealed to the members present to support the Committee of the Association in carrying out the new curriculum of architectural education, expressing his intention of voluntarily subscribing one guinea per annum in lieu of half a guinea. The appeal resulted in a long list of names being handed to the chairman as guinea subscribers for next year; leaving the subscription for future years optional. "The Prosperity of the Association, its new Constitution and Curriculum," was then drunk with enthusiasm. The Chairman was instructed to convey to the President, Hon. Secretaries, Editors of *A. A. Notes*, the Committee, Special Educational Committee, and the professional press, the warmest thanks of the junior members for their successful efforts to increase the educational advantages hitherto offered by the Architectural Association. Mr. Earle announced that as a result of the success attending the Saturday summer visits of the Sketching and Measuring Class for the study of old work in and around London, an excursion for one week for junior members would be arranged this summer to some place of architectural interest, probably in the North of England, when he hoped that satisfactory arrangements might be made to enable members of provincial architectural associations to take part if so inclined. It is proposed to arrange for a second dinner to be held later in the session.

COMPETITIONS.

MUNICIPAL LODGING-HOUSE.—In this important competition, held under the auspices of the London County Council, the award of the assessors (Mr. Waterhouse and Mr. T. Blashill) has been presented. It recommends that "the premiums should be awarded as follows:—To Messrs. Gibson & Russell, 27A, Old Bond-street, 100*l.*; to Messrs. Williams & Hopton, 156, Regent-street, 40*l.*; to Messrs. Chorley & Connon, 15, Park-row, Leeds, 30*l.*; to Mr. T. Locke Worthington, 23, Queen Anne's-gate, Westminster, 30*l.*" The matter will now be brought before the Council for its determination. The drawings are not yet publicly exhibited, but it is expected that they will be arranged in some convenient room for public exhibition in a few days.

NEW WORKHOUSE FOR CAMBERWELL.—We are informed that the Camberwell Guardians, at their last meeting, selected, in a limited competition, the designs of Messrs. Wilson, Son, & Aldwinckle, for the new workhouse at East Dulwich, for 1,000 inmates.

GIRLS' GRAMMAR SCHOOL, BARNET, HERTS.—In a limited competition for these buildings, the scheme submitted by Mr. John Ladds, of London, has been selected, and the plans will be put in hand at once.

SURVEYORSHIPS.

WORTHING.—Mr. Aspinall, Town Surveyor of Stroud, has been appointed Borough Surveyor of Worthing. There were ninety-three applications.

BILSTON.—Mr. W. Green, Surveyor to the Bilston Commissioners, has tendered his resignation.

THE RIDING-SCHOOL, KNIGHTSBRIDGE.—The Duke of Wellington has decided to sell his freehold property, commonly known as the Duke of Wellington's Riding-school, with the stables, coach-house, &c., at Knightsbridge. The premises are numbered 42, Albert-gate, and cover an area of nearly 17,000 ft., having frontages of 84 ft. to the main road, 86 ft. along Hyde Park, and about 126 ft. to Park-place If not previously disposed of, this property will be put up for sale at the Mart on March 17 next.

Illustrations.

THE BEAUCHAMP CHAPEL, WARWICK.

THE Beauchamp Chapel stands on the south side of the chancel of St. Mary's, Warwick, and was commenced in 1443 and consecrated in 1475 as a monumental chapel for Richard Beauchamp, Earl of Warwick. His tomb stands in the centre, and is well-known, with its elaborate workmanship and curious "hearse" over the effigy. The effigy itself is carefully given in Stothard's Monumental Effigies, and the whole monument is given in Blore. The drawings from which these illustrations are taken were submitted in competition for the Institute Silver Medal, and gained for their author, Mr. Harold Brakspear, an "honourable mention."*

DESIGN FOR CONGREGATIONAL CHURCH, WEST KENSINGTON.

THIS design was submitted in a limited competition for the above building, but was not successful, that prepared by Messrs. Cubitt & Brydon being chosen and since carried out.

The general plan of the church was intended to be cruciform, four main piers carrying the the roofs at the intersection. Most of the congregation were to be seated on the ground floor, with an end gallery reached by staircases in the base of tower and corresponding turret.

Behind were vestries and large lecture-hall, whilst beneath was a complete school, with series of class-rooms all round.

The design is by Messrs. Potts, Sulman, & Hennings.

EXAMPLES OF EARLY BYZANTINE ARCHITECTURE.

THE diagrams here given are a portion of the illustrations to Professor Aitchison's first Royal Academy lecture, which is fully reported in another column.

THE EXAMINATION AND REMUNERATION OF MUNICIPAL ENGINEERS.

MR. LEWIS ANGELL, F.R.I.B.A., M.Inst.C.E., in the course of his paper read at last week's meeting of the Incorporated Association of Municipal and County Engineers, referred to in our report of the meeting (p. 69, *ante*), said:—

For a long time the Town Surveyor also combined the functions of the Sanitary Inspector and Medical Officer, so far as such functions were performed. These offices now exist collaterally, each working in its own proper province and in unison. Reference has already been made to the crude and unsatisfactory work of the past, neither the professional status, remuneration, nor treatment being such as to secure or retain efficient service. The development of sanitary principles required competent exponents. A leading object of the founders of our Association was to bring about an improvement in this respect. One of the articles set forth in our incorporation is:—

"The promotion of the professional interests, rights, powers, and privileges of County, Urban, and Rural Engineers, the improvement of their professional status, and the extension and interchange of professional knowledge and practice."

Another of our objects is:—

"The examination of persons in Engineering, Surveying, Building Construction, Sanitary Science and Works, and in Local Government and Sanitary Law."

The question of the qualifications of public officers has been much discussed. The Medical Officer has to prove by examination that he possesses at least a minimum of qualification; and by a parity of reasoning, the Engineer should also be required to prove his capability.

In the matter of examination, our Association has come into some conflict with a junior Association,—the Sanitary Institute,—a body which has done good work in promoting a public interest in sanitation, and whose proper field is education. But we considered it our duty to oppose their action in seeking by Royal Charter the right to examine us. Our Association is strictly professional and official, whereas the Sanitary Institute is a heterogeneous society open to all-comers. We do not object to examination in principle, but we repudiate the claim of such a body as the Sanitary Institute to be our examiners. We claim to know more about these matters than the Sanitary Institute, and if such examinations are to be conducted by a private society, we claim to be the better examiners. It will be said that we claim to examine ourselves. We reply that our examinations were established as a protest against the Sanitary Institute usurping the position, but that public confidence would be better satisfied with the *testamur* of some qualified body legally constituted for the purpose. We have the Chartered Institution of Civil Engineers, and the Royal Institute of British Architects, representing and having the confidence of the professions; the Universities; and the Civil Service Commissioners. In or from these, or some of them, a representative Board of Examiners might be constituted. It is of the highest importance that responsible sanitary officers should have a thorough knowledge, not only of sanitary science, but also of practical work. A very young and inexperienced man may obtain a "cram" diploma, but the practical experience of an engineer cannot be obtained by book-work. The genius of Invention, Art, and Science cannot be hedged round by examinations. George Stephenson never passed any examination. In such matters diplomas may have a fictitious value, to the detriment of real worth. Nevertheless, if by examination we can eliminate quacks, we do not object to such a test being applied to candidates for local office; indeed, we would gladly extend it also to our local governors.

During the last few years, with the extension of legislation and the better appreciation of sanitary work, the position of the municipal engineer has greatly improved. Speaking generally, the officers of the larger towns, and proportionately those of the smaller towns, have not now much reason to complain of, either as to status or remuneration. The Association has congratulated itself on this result; but recently there has been a retrograde movement. It was the general opinion of the profession that London did not attach to the office of its Chief Engineer sufficiently liberal conditions, having regard either to its importance and possibilities, or to comparison with other official positions. Unfortunately, the bad example, as is always the case, was immediately followed by the second city of the Empire, Liverpool, the conditions of which appointment, and the reduction of the previous salary by one-third, is a deliberate case of professional sweating. As a matter of fact, towns of less magnitude offer much better conditions; and as a matter of comparison, whether of rateable value, population, or importance, the anomaly is still more conspicuous. Liverpool was unjust to the profession, and its example has seriously damaged the interests of appointments of the first rank.

The municipal engineer is at a disadvantage in representing a spending department which produces no dividend, excepting in health and comfort,—matters which are not appreciated till lost. The engineers of docks, railways, gas and waterworks,—in fact, the engineers of all such quasi-public and private works,—receive better consideration, and happy immunity from the very many petty worries of public office. These private engineers generally represent interests adverse to the ratepayers, therefore the municipal engineer should be in a position to meet them professionally and socially on something like the same level, otherwise it may be to the disadvantage of his town. Public office is very harassing at the best to a sensitive and high-spirited man, and consequently it is avoided by many of the best qualified; therefore, unless sufficient inducement be offered, efficient service will not be secured. If the public service is to be put up to auction for the lowest bidder, candidates will be more numerous than select. It is not, however, suggested that the first two cities of the Empire are not at present well served in their engineering staff. Our Association has the honour of being represented in these two appointments by gentlemen of known ability, which only accentuates the argument. It is sweating! The levelling-down of salaries will result in an all-round decadence of official service, and will divert capacity into other channels where it is better appreciated.

The Chairman (Mr. H. P. Boulnois, City Engineer of Liverpool, and President of the

* Mr. Rimmer's set of drawings, to which the Medal was awarded, will be published in a future number; they are at present being exhibited out of London.

Association), in moving a vote of thanks to Mr. Angell for his interesting paper, said that, though perhaps it contained some points open to discussion, he thought that, considering the special occasion and circumstances, it would be best to regard the paper on the same footing as a presidential address, and to exempt it from any formal discussion at that meeting. He wished to say, however, that while the paper contained a very heavy indictment against the competency and general fitness of many of our local governors, he thought that there were at the present time marked signs of improvement in the characters of the men who were taking part in municipal government. As to the examination question, he believed that the reason why the Sanitary Institute held examinations for sanitary surveyors was that that body was the first to initiate such examinations. Although he (the Chairman) was a Fellow of the Sanitary Institute, and one of its examiners, he did not think, and he had never thought, that the Institute was the proper body to examine professional engineers and surveyors. He might, however, inform the meeting that that department of the Sanitary Institute's examinations was gradually dropping through, while, on the other hand, there was a great increase in the number of candidates who sought to pass the examination for Inspectors of Nuisances. In that and in other ways the Sanitary Institute was doing a very useful and valuable work, and he really saw no reason why there should be any conflict or jealousy between the two bodies.

Mr. Charles Jones (Ealing), hon. sec. of the Association, seconded the vote of thanks to Mr. Angell, and said that he agreed with the President that there was no longer any reason why there should be any antagonism between the Association and the Institute. There was certainly no desire on the part of the Association to be antagonistic to the other body, and he was glad to believe that the sore feeling which had existed at one time was gradually dying out. There was no reason why the two bodies should not work hand-in-hand.

The motion having been put and carried by acclamation,

Mr. Angell briefly replied, and said that he had no strong antagonism to the Sanitary Institute, for he was a Fellow of ten years' standing. But while he cordially agreed with what had been said as to the useful work which the Sanitary Institute had done and was doing in the promotion of a popular knowledge of sanitation and in the education of sanitary inspectors, he still held firmly to his opinion that the Sanitary Institute was not the body to hold examinations as to the competence of engineers and surveyors.

LECTURES AT UNIVERSITY COLLEGE.

ON Monday afternoon, Mr. W. St. Chad Boscawen delivered the second of his course of lectures on Babylonian Archæology, the subject being Babylonian History in relation to Archæology. He said that the period with which they were dealing extended from B.C. 4000 to 2000. He quoted numbers of examples of dates from inscriptions proving that at any rate the date of 3800 B.C. could be established historically. Yet there is considerable evidence from the cuneiform inscriptions to show that the civilisation was much older than that. Mr. Boscawen next described the pictorial character of many of the signs and syllabaries, showing that the cuneiform must have been originally pictorial, like the ancient Egyptian. It had already, at the above date, passed through several stages of development and had reached the syllable and phonetic stage. Now these stages could not have been accomplished in a few decades, but must have required a long period. It may, therefore, be concluded that the Chaldean civilisation had a very remote antiquity. Mr. Boscawen proceeded to describe some of the earliest centres of civilization. He pointed out that the sacred city of Eridu was the spot at which most undoubtedly some elements of civilization were introduced by a maritime people. There was also a probability of this being the point of contact with Egypt. The lecturer next referred to the chief city-kingdoms of Babylonia, and showed how these had grown up as independent centres of civilization,—the cities Erech, Lagash, and Sippara being most important. He described the overthrow of those kingdoms by the Elamite invasion, B.C. 2280, and remarked that this great incursion seemed to be synchronous with the migration of Abram and the Hyksos invasion of Egypt. The domination of these foreigners seems to have lasted for, perhaps, not so much as half a century, but its influence seems to have been widespread. It was, however, overthrown by Hammurabi, B.C. 2200, from whose reign the rise of the unified Babylonian empire may be said to date. Mr. Boscawen, in conclusion, described the principal features of this reign, and the wonderful public works carried out by the great builder-king. The next lecture will be on the interesting topic of Babylonian Arts and Crafts.

THE LONDON COUNTY COUNCIL.

THE ordinary weekly meeting of the London County Council was held on Tuesday afternoon last, Sir John Lubbock, Chairman, presiding.

Tenders.—Tenders were received for the erection of a Weights and Measures Office at Newington, and referred to a committee for consideration. The list will be found in our columns this week under the head of "Tenders."

The Bethnal Green Slum Clearance Scheme.—The greater part of the sitting was devoted to the consideration and discussion of the Report of the Housing of the Working Classes Committee on the Boundary-street Area scheme, Bethnal Green. The report contained the following passages:—

"*A.—Carrying out of the Scheme.—Proposal to deal with the Area in Sections.*

Feeling confident that the Council would desire to cause as little inconvenience as possible to those who at present live there, and having regard to the difficulty of finding accommodation for them elsewhere, your Committee have decided to recommend that the area be dealt with in sections. Hitherto when large schemes have been carried out, clearances have not, as a rule, been effected by sections, nor has accommodation been provided beforehand into which those first displaced could be at once moved. A wholesale clearance of the Bethnal-green area would render it impossible to make provision beforehand for those removed, would seriously inconvenience them in their various occupations, and would tend to cause overcrowding in adjoining districts. For these reasons your Committee are of opinion that it is necessary to divide the area into three sections, as affording the best means of carrying out the scheme successfully, and with the least harm to those concerned. It is proposed first to clear Section I. This portion is selected as it contains some of the most insanitary parts of the area. When Section I. is cleared, and dwellings for the working classes are erected, Section II. will be commenced, the newly-erected dwellings in Section I. providing accommodation for the majority of those now resident in Section II., if they desire to avail themselves of it. When new buildings are erected on Section II., Section III. will be dealt with in the same manner. There will be displaced from Section I. about 1,860 persons; in Section II. about 2,050; and in Section III. about 1,810; making a total of about 5,720 persons. In four-storied dwellings there will be ultimately re-housed on Section I. about 1,180 persons; on Section II. about 1,800; and on Section III. about 1,620; making a total of about 4,600 persons. Thus 1,120 persons less will be housed on the area, but the present proposal provides for 2,000 elsewhere, and, therefore, it may be found possible to use part of Section III. for other purposes of a more remunerative character. It must, of course, be understood that it is only the duty of the Council to provide for persons equal to the number of those displaced. Experience proves that many of the latter will not avail themselves of the accommodation provided for them. While Section I. is being dealt with, Sections II. and III., with the exception of houses totally unfit for habitation, will have to be kept in temporary repair, and the rents collected. The question of the maintenance of property let to tenants, and not immediately required for demolition, received special consideration by the late Metropolitan Board of Works in 1883-4. It was then contended that the more economical plan would be to close all the houses immediately they were required. It was ascertained, however, that, after allowing for repairs, rates, taxes, and expenses of management, there remained an excess of income over expenditure. The proposal, therefore, to carry out the scheme in sections will entail no extra expense, while it meets to a great extent the re-housing difficulty.

B.—Re-housing.

As has already been stated, the total number of persons belonging to the working-classes who now live on the area amounts to 5,720. By law, unless special circumstances render it unnecessary, accommodation must be provided for at least as many persons as may be displaced in suitable dwellings situated within the limits of the scheduled area, or in the vicinity thereof. Your Committee are not aware at the present moment of any special circumstances rendering this unnecessary, and they therefore consider the Council bound to find suitable accommodation for the total number to be displaced.

Accommodation for Tenants removed from the most Insanitary Houses.

In order to carry out the above-mentioned duty, your Committee have had first to consider how to rehouse those who are living in the most insanitary houses, which would be closed immediately on the Council obtaining possession. The number of these houses is 65. Thirty are closed, and the remaining 35 are occupied by 288 persons, for whom suitable dwellings must be provided.

Goldsmith-square Site.

To meet this want, your Committee have made inquiries as to vacant land in the vicinity of the area, and have ascertained that the only vacant site that can now be acquired is the Goldsmith-square site. It is distant, as nearly as possible, 1,000 yards from the Boundary-street area. Its present area is 47,854 square feet, or 1·098 of an acre; and the frontage to Goldsmith-row is still occupied by small houses and shops, some of which have been closed.

If the Council purchases this site, the building lines in Goldsmith-row and Goldsmith-square would be set back, which would reduce the area for building purposes to about 36,000 square feet, or ·83 of an acre. There will be a frontage of about 180 ft. to Goldsmith-row, and about 300 ft. to Goldsmith-square, and the new buildings will reap the advantage of increased light and air. Buildings of four floors will accommodate 500 persons, with proper provision as regards baths and washhouses. The price which the owners have agreed to, subject to the approval of the Council, is 8,500*l.*, equal to an annual rental of about 2d. per foot. The estimated cost of the buildings, which will contain about 250 rooms, will be 16,000*l.*:—

Cost of land	£8,500
Estimated cost of buildings	16,000
Total	£24,500
Interest at 3 per cent.	£735
Repairs and outgoings	487 10
	£1,222 10
250 rooms at 2s. per room (average size 1,206 cubic feet) =	£1,300

Your Committee are of opinion that in order to meet the initial requirement it is necessary to acquire this site without delay, under Part III. of the new Housing Act, and thus to be prepared to move those first displaced into dwellings, which under the provisions of the Act must be erected and managed by the Council. The Council will, therefore, be able to test by experience the possibility of moving those displaced into other quarters. Part III. of the Act, formerly known as Lord Shaftesbury's Lodging House Act, has never been put in force in London, with the exception of the lodging-house to be erected by the Council on the Shelton-street area. If the Council authorises this proposal, the sanction of the Home Secretary will have to be obtained, but there is every reason to believe that in order to carry out the duty imposed on the Council by Part I. to provide accommodation, the assent of the Secretary of State will be given to the employment of provisions under Part III. for that purpose. It may be added that after seven years it will be in the power of the Council to sell the dwellings for the best price that can reasonably be obtained for the same, but this is not the present intention or proposal of your Committee.

Accommodation for those removed from Section I.

Having thus provided for 145 persons removed from the worst houses in Section I., and for 143 persons from Sections II. and III., accommodation will have to be found for 1,712 persons when Section I. is cleared. Your Committee propose to find this accommodation in the following manner:—

(*a*) *Removal to the Suburbs.*—First, your Committee deemed it expedient to ascertain amongst the working classes over the whole area how many were willing to remove to the suburbs. The result of these inquiries showed at first that about one-tenth (180 from Section I.) declared themselves ready to move outside the metropolis. It has lately transpired, however, that this number may be decreased unless special inducements are offered.

As the Great Eastern Railway, which is at the head of the metropolitan railways in giving facilities for workmen's trains, passes through Bethnal Green, your committee have caused inquiries to be made as to suitable accommodation on that line. They have ascertained that within five minutes' walk of the various stations there are at the present time 163 empty houses, and 37 houses partly vacant. The total number of rooms available is 1,014, or accommodation for about 2,028 persons. These houses are within the limit of the 2d. workmen's return fare, and about five minutes' walk to the stations. At Enfield, houses of six rooms, newly built and in good repair, can be hired at 5s. and 5s. 6d. per week. Houses with four rooms can be hired at 4s. 6d. a week. At Ponder's-end, cottages are let at 4s. 6d. or 5s. for four rooms within half a mile of the railway station. Workmen's tickets are 1s. a week. The same prices are found in Lower Edmonton and White Hart-lane. Rents elsewhere vary from 6s. to 7s. a week for five and six rooms.

There will, therefore, be no difficulty in obtaining suitable accommodation for all those who are willing to move to a distance, but your Committee are aware that but a small number will avail themselves even of cheaper and better dwellings when they are at a distance from town life.

(*b*) *Guinness Dwellings.*—Secondly, workmen's dwellings are in course of erection by the Guinness Trustees about 850 yards from the Boundary-street area. Your Committee therefore communicated with the trustees, asking whether they would be able to accommodate some of those to be removed from the area. A courteous answer has been received, stating that it is their intention to endeavour to house a class of persons who are not usually provided for in the existing artisans' dwellings,—namely, the very poor who earn small wages; and that they desire to consider primarily applications coming from the immediate neighbourhood. Under these circumstances the trustees are unable to enter into any engagement to house even temporarily persons not within the limitations mentioned. They add, however, that they have every desire to assist the Council as far as possible, and they will give every consideration to applications coming from suitable persons who may be displaced by the scheme of the Council. As many of the tenants on Section i. belong to the class whom the trustees desire to house, your Committee feel assured that they can rely upon the assistance of the trustees in the matter. The Guinness Dwellings will accommodate probably about 1,500 persons, to be ready in the spring of 1892, and it is not too much to hope that 480 will be housed therein from the Boundary-street area. It may be added that an increase of vacant accommodation in this neighbourhood will be caused by the action of the trustees.

(*c*) *Gossett-street site.*—Thirdly, the Council has already been informed that cottage dwellings are to be erected by private enterprise on the vacant Gossett-street site, which is within a quarter of a mile of the Boundary-street area. There will be accommodation for about 200 persons, and it is the intention of your Committee to enter into communication with the owner to take as tenants some of those who will be displaced under the proposed scheme.

(*d*) *Vacant accommodation in the neighbourhood.*—Lastly, the number of vacant rooms within half a mile of the area is 790, which would accommodate about 1,580 persons. The weekly rents of the large majority of these rooms (675) are about the same as in the insanitary area—*i.e.*, from two to three shillings a room. In the remaining 115 the rent exceeds 3s. per week. It will be the duty of your Committee to give information to those displaced as to this vacant accommodation, into which at least 700 will have to be moved. It must be borne in mind, however, that this accommodation is not of a very good class, and that it would only be possible for the Council to give information with regard to those tenements which are sanitary and in good repair. It would, moreover, be unwise to count upon more than a minimum of this accommodation at a future date.

It may be convenient to summarise the proposal of the Committee as to the rehousing of those to be first displaced.

DISPLACEMENTS.

Removals from worst houses on Sections ii. and iii.		143
Removals from Section i.		1,857
		2,000

PROVISION IN NEIGHBOURHOOD.

Goldsmith-square site		500
Gossett-street		200
Guinness-buildings	1,500	
Vacant accommodation within ½ mile	1,580	
	3,080	
Proportion of above which may be calculated on as available in 1892	1,300	
		1,300
		2,000

SUBURBAN ACCOMMODATION.

168 empty houses within easy reach and available for 2,000 persons. Apart from fresh building, it may be calculated that a quarter of these houses might be available in 1892, so that as many as would go to the suburbs could be provided for, and the required accommodation in the neighbourhood would be thereby decreased.

C.—Time required to carry out the scheme.

It is impossible to state with any certainty the time required to carry out the scheme, but your Committee are informed that, judging by former schemes, the first section could not be cleared in less than two years from the date of the confirming Act. Your Committee will make every effort to prove that this delay is unnecessary. A further period of about eighteen months would then be required for the paving work and the erection of buildings. The clearing, paving work, and building on the second section would require another eighteen months. It would therefore be about five years from the date of the confirming Act before the clearance of the third section can commence. This delay is caused at the commencement by the fact that the compulsory acquisition of the interests of all the owners and lessees for the whole area must take place at the same time, and, as negotiations must occupy some time, it would probably be six months after passing the confirming Act before schedules could be deposited at the Home Office, and the Home Secretary be asked to appoint the arbitrator. Hearing the disputed cases would also occupy some considerable time, and the arbitrator's award would not be issued for at least another six months. Each party would then have the right to compel the Council to proceed with the purchase, but, subject to complying with requests of pressing claimants, the attention of the conveyancing department would be first concentrated on Section i.

The confirming Act will probably be passed in July next, 1891, and the arbitrator's award on disputed cases would be issued about July, 1892. After the settlement of the purchase of Section i. it will be cleared by about July, 1893, and the paving work will be completed and dwellings will be erected about January, 1895. Dwellings on the second section would be ready about July, 1896, when the third section would be cleared. It has already been stated that after the whole area is acquired (about November, 1892) Sections ii. and iii. will be held and managed by the Council without any loss.

D.—Finance.

It remains only for your Committee to report as to the estimate of receipts and maximum expenditure on capital account—

Estimate of Receipts and Expenditure on Capital Account.

RECEIPTS.

Date.	Description.	Amount.
1893-4	Sale of land for building workmen's dwellings	£4,000
1894-5	"	36,000
1895-6	"	4,000
1896-7	"	38,000
1897-8	"	24,000
	Balance—net cost	300,000
		£406,000

EXPENDITURE.

Date.	Description.	Amount.
1891-2	Preliminary expenses, cost of local inquiry, expenses in Parliament, purchases of property by negotiation, costs of arbitration	£100,000
1892-3	Costs of arbitration, purchase of property by negotiation and under arbitrators' award	200,000
1893-4	Purchase of property under arbitrators' award, cost of new roads	70,000
1894-5	Purchase of property, cost of new roads	12,000
1895-6	Purchase of property, cost of new roads	12,000
1896-7	Purchase of property, cost of new roads	12,000
		£406,000

Recommendations.

Your Committee, having now laid before the Council all the information they possess, and their proposal as to the carrying out of the scheme authorised by the Council, recommend,—

'1. That the Council do approve of the proposed manner of dealing with the Boundary-street area in three sections.'

'2 That subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, and to the consent of the Secretary of State, the Goldsmith-square area be purchased by the Council for £8,500, under Part III. of the Housing of the Working Classes Act, 1890.'"

On recommendation No. 1, Mr. John Hutton moved, as an amendment:—

"That the Boundary-street area, if the improvement is sanctioned by Parliament, be dealt with in four sections instead of three."

Mr. Hutton argued that the division of the area into four sections would be found far more economical and convenient than its division into three sections.

On a show of hands, the amendment was defeated by a large majority.

Mr. Charles Harrison then moved, and Mr. Debenham seconded, the following amendment:—

"That recommendation No. 1 be referred back to the Committee with an instruction that the Committee do proceed with the acquisition at the earliest date for the purposes of demolition of all such houses, courts, and alleys included in the Act to be passed authorising the scheme as, at the date of such acquisition, are unfit for human habitation, and that the Council do not hold or manage any of the houses comprised in the area of the scheme, and which, in the official representations which the Council took into consideration and were satisfied of the truth thereof, were stated to be unfit for human habitation."

On a show of hands, the amendment was lost by an overwhelming majority, after which, recommendation No. 1 was agreed to.

On recommendation No. 2, Mr. Rhodes moved that it be disagreed with.—This amendment was supported by Mr. Hutton, Dr. Longstaff, and others.—Upon a division it was lost by 41 votes against to 31 for.

Mr. Hutton moved, and Mr. Roberts seconded, an amendment to refer the matter back, but, on a show of hands, it was defeated by 35 votes against 27.

Mr. Leon then moved that the words "Part III. of" should be omitted from the recommendation, explaining that he did not desire the Council to carry out the building operations itself. This was carried by 39 votes against 34, and the recommendation as amended was approved.

After transacting other business, the Council adjourned.

ARCHITECTURAL SOCIETIES.

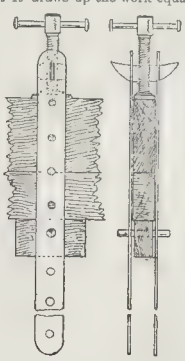
GLASGOW ARCHITECTURAL ASSOCIATION.—The fifth lecture of the present session of this society was given on the 20th inst. by Mr. John Scott, decorator. The President, Mr. William J. Anderson, occupied the chair. The lecturer's subject was "Decoration," particularly as applied to the adornment of wall surfaces, and his paper was illustrated by a collection of Japanese vases, wall-hangings of different kinds, stained wood panels, photographs, and designs. A hearty vote of thanks was passed to Mr. Scott.

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE, AND ART.—The Council of this Institute have arranged for opening a room in the office of the Hon. Sec., Mr. John James Henderson, 8, Bank-street, Dundee, as a library and consultation-room for the use of members. This arrangement is only regarded as a first step towards the attainment of permanent premises for the Institute.

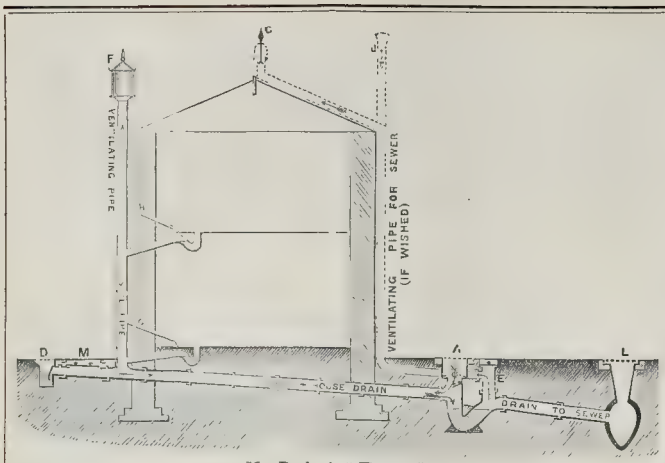
OBITUARY.

FRIEDRICH VON SCHMIDT, architect, whose decease on January 23 at Vienna is announced, was born on October 22, 1825, at Frickenhofen, Württemberg. He commenced his studies at the Polytechnic School at Stuttgart under Mauch and Breymann, where he also learned the trade of stonemason. In 1843 he went to Cologne, and was employed as a journeyman at the restoration of the cathedral. In 1848 he became master stonemason, and in 1856 he passed the Government examination as "Baumeister" at Berlin. In the competition for the Vienna Votive Church he gained the third prize, and in that for the Berlin Town-hall the first prize. In 1857 he followed a call as Professor of Architecture to the Milan Academy, and was charged with the restoration of San Ambrogio, a work interrupted by the Italian war. Since 1859 he filled the post of Professor at the Academy of Fine Arts in Vienna. He built the Lazarist Church there, the parish church at Fünfhaus, and the Gothic church at Graz. In 1862 he was appointed architect of St. Stephen's. His other principal works, besides the Vienna Town-hall (his masterpiece) and the Sühnhaus (the Votive chapel erected on the site of the Ringtheater), are the Academic Gymnasium and the restoration of St. Stephen's. After the inauguration of the Town-hall, which took place on September 12, 1883, he was ennobled, receiving the title of "Freiherr" (Baron).

PATENT SCREW CLAMP.—The accompanying sketch shows the "Excelsior" screw clamp, made by Mr. F. Greenaway, of Slough. The advantage claimed for it is that it draws up the work equally on each



side. The side plates are of bright steel, which are supplied to any length, so that several pairs can be had for the same head. The block is of hard wood, with a steel pin fixed in it.



Mr. Buchan's "Fig. 273."

Correspondence.

To the Editor of THE BUILDER.

VENTILATORS TO SOIL-PIPES.

SIR,—Mr. Sugg, on page 72, states that my remark on page 52 that I did not "at present" believe that he and Mr. Simmance had any practical idea of ventilating drains or soil-pipes with the water-current (as illustrated by him on page 34) until after the appearance of my letter in the *Builder* of November 8 last is "unwarranted." Now, by using the words "at present," I left it open for Mr. Sugg to give *some satisfactory evidence* that he and Mr. Simmance really had published this idea *before then*, but he has not given any such evidence. Moreover, he has not even asserted he could produce such. The words, "always had in view," are rather vague as to time. Does this "always" mean five days or five weeks, or how long?

For either Mr. Sugg or Mr. Simmance to pose as a plumbers' teacher on the basis of retailing to them, in 1890-91, as new, ideas and plans which they—the plumbers—have known about for years back, is not good enough.

Plumbers have carried out in practice, on a better plan than is shown on p. 34, the idea of making the air and water currents both go the same way, so they did not require Mr. Sugg to pretend to teach them what they knew much better already without him.

In reference to my fig. 6 on p. 52, Mr. Sugg tells us that he viewed the close-plates over the trap with a magnifying glass, and they are not plates, but "gratings."

Now, had he applied the magnifying-glass to his brain instead of to his eye, he would have known that what he took for microscopic openings were the spaces between the lines of the hatching. In the 1883 drawing the plate above the house-side of the trap is marked by a thick black line. To have shown or put in an open grating over the trap with a side high level outlet or inlet would have defeated the object in view. So on pages 224, 239, and 254 of my text-book on plumbing I speak of "an iron close lid," "a solid plate," and "an iron plate," as being placed over the top of the disconnecting-trap in the circumstances. Figs. 283 and 293 indicate these solid plates, and show them clearly on a larger scale.

We need not leave fig. 273 in my book, however, which on page 52 caused me to say that Mr. Sugg's pseudo new plan was similar to it, for in it the close lid and solid plate are distinctly seen above the side connexion. All the difference that I can see between Mr. Sugg's drawing on page 34 and my old one is that he has added a story to the house, and joined the blow-off pipe to the house-side of the trap with a plate over the trap; and he omits to ventilate the sewer, and shows only one ventilator, just as I had already done years ago, only my fig. 6, on page 52, is free from Mr. Sugg's mistakes, on page 34, of showing four fresh-air inlets, and imagining that with these the air would come down the soil-pipe as intended!

This glaring mistake shows clearly how little he really knows of the subject, while his attempt to justify himself on the plea that these extra inlets are in my old drawing only makes matters worse for him. His alteration at the trap altered the conditions, while, in 1891, he, while presuming to teach plumbers, should have advanced upon 1883 plans, instead of making things worse.

Mr. Sugg asserts he never recommended his valve-ventilator for use "on the top of a soil-pipe." I beg to point out that it was publicly stated that one was to be seen "covering a soil-pipe" at Messrs. Sugg's works in Regency-street. Now, I imagined that "covering" was equivalent to "on the top of." The drawing accompanying this statement showed Mr. Sugg's cowl, but the valve inside was not that in either his or Mr. Simmance's specifications, but the old sloping hinged valve, in my style.

I do not assert that *now*, after this discussion, Messrs. Sugg & Co. will recommend valve ventilators for topping or covering soil-pipes. I may point out, however, that Mr. Sugg's drawing on page 34 is more for ventilating the *drain* than the soil-pipe. To ventilate the soil-pipe *per se* with air and water currents both going down it, he might have altered fig. 269A in my book by showing the rain-pipe as the foul-air outlet, and, taking the ventilator off the soil-pipe, put it on to this air-pipe, said air-pipe being carried up to a proper height. A solid plate to be put on above the house side of the trap.

Mr. Sugg admits that my fig. 5 cowl, on page 52, is like his new one. In that case, as my one is the older of the two, where is the foundation for his patent, unless for the addition of the small tube to Simmance's pot-lid valve?

I consider this pot-lid valve or disc, as shown on page 51, much inferior to my older hinged valve for use in ventilators upon buildings,* and this valve and ventilator, as per fig. 5, page 52, is public property, and hard fire-clay rests can be used for the valve if wished. This hinged valve was never known to Dr. Arnott that I know of, and especially not for use inside an outside ventilator, as per figs. 4 and 5 on page 52. Mr. Simmance, under date September 11, 1890, wrote that the Sugg ventilator with the balanced-hinged valve in it "is one of the forms under the patent." Under what patent? He said, "Being counterbalanced, it is very sensitive." It so happens, however, that this counterbalancing plan was published by me in 1878. Supposing some other person invented it before me, that makes the attempt to claim it anew in 1890 no better.

In concluding, Mr. Sugg says he did not experiment with his valves with candles inside a building, but in the open air. I also experimented with his ventilator in the open air, when my ventilator beat his by several hundred linear feet of greater updraught per minute, while in one of the tests, *in the open air*, the plain open pipe beat his ventilator.

W. P. BUCHAN.

P.S.—As it may be both interesting and useful for the readers of the *Builder* to be able to compare Mr. Sugg's drawing on page 34, with my old fig. 273 drawing, I send block of same, and then these two can be compared along with my fig. 6 plan on page 52. All of these plans are inferior to others I have. W. P. B.

*** We fear we cannot extend this correspondence further. By way of a word of entirely impartial comment, we may observe that we think Mr. Buchan's very small diagram on page 52 was misleading; we, at all events, took the dots over the trap to mean an open grating. Mr. Sugg has certainly some excuse for his remark that Mr. Buchan, while condemning Mr. Sugg's separate branch air-pipes, had shown the same thing himself in one of his own diagrams, the one reproduced with this letter. On the other hand we consider Mr. Buchan is right in saying that in Mr. Sugg's system shown on page 34 the vertical fresh air pipe, especially if on the south side of the building, cannot be depended on to act as an inlet under all circumstances, and if it became an upcast, it would probably be drawing sewer air into the soil-pipe instead of fresh air. Mr. Sugg's system is admirable as long as it acts as intended, but we do not think it can be depended on to do so.—ED.

* If a building could be sent flying through the air at ten miles an hour on a calm day, then a motive power would be got to raise the pot-lid valve or disc, but we cannot manage that.—W. P. B.

"BROKEN CROCKERY MOSAIC."

SIR,—Referring to a paragraph on page 72 of the last issue of the *Builder*, will you allow me to mention that "broken crockery mosaic" was described, with full instructions for carrying it out, in the *Art Journal* for 1886?

It would seem, therefore, that the particular example to which the paragraph refers cannot well justify any "claims to be a *new* kind of mosaic pavement." It very possibly originated even earlier than 1886. T. O. HINTON.

14, *St. Mary Axe*, January 26, 1891.

The Student's Column.

VENTILATION AND WARMING.—V.

NATURAL VENTILATION THROUGH POROUS ENCLOSURES.

OF very great importance in connexion with any application of ventilation is that form of natural ventilation which we may call "involuntary" ventilation, the result of the diffusion of the internal and external atmospheres through porous walls, ceilings, and floors, and through more or less imperfectly-fitting doors and windows. This "involuntary" ventilation is of greater or lesser activity according to the variation of the difference of internal and external temperature, the variation of wind-pressure, and the nature of the materials of which the walls, &c., are constructed. The change of atmosphere is not, however, to be considered due only to temperature difference or wind-pressure. Even if both these assistant agencies were inoperative, if the internal and external atmospheres were of the same temperature and at the same pressure, there would still be a constant change through porous substances by the operation of the diffusion of gases.

So great is the effect of this involuntary ventilation that, in many rooms, with the doors and windows shut, the internal atmosphere, with a difference of temperature of, say, 30 deg. Fahr., will be completely changed in the course of a single hour, quite independently of any ventilation from chimneys and fires or other means.

We need hardly be surprised at such a result as this, when we remember that many of our building bricks have so much porosity that they will absorb one-sixth of their weight, or one-third of their bulk of water; and that air is nearly 800 times more fluid than water; hence the permeability of our construction to the air must be considerable.

The precise extent of the atmospheric change occurring under various circumstances is difficult of calculation. We have not as yet sufficiently reliable data to enable us definitely to state what, in any particular case, may be relied upon to occur by the operation of this form of natural ventilation.

Investigations have been conducted by several physicists, especially in Germany, but the results of their inquiries have not been sufficiently harmonious to justify the adoption of any universal rules or the deduction of any general laws.

Thus Pettenkofer, experimenting on the air of a room with stone walls, found that, with a difference between the temperature of the internal and external atmospheres of 19 deg. Cent., the extent of air-change in one hour amounted to 1·14 cubic mètres for each square mètre of wall-surface, which we may in round figures express in English nomenclature as a change of 4 cubic feet an hour for each square foot of wall-surface, with 30 deg. Fahr. difference of temperature. Pettenkofer's experiments were made by the estimation of the amount of carbonic acid in the atmosphere at certain intervals of time; hence in such an experiment the change due to simple diffusion of the gas, independently of the difference of temperature, is a source of error, which is still further increased by the variation of the specific gravity of the internal atmosphere caused by the artificial addition of the heavy carbonic acid for the purpose of experiment.

Other investigators, Schulze and Maerker, as the result of their experiments with walls of

various material found that, with a difference of temperature of 19·3 deg. Cent., the following amounts of air passed through a square mètre of wall surface in one hour for each material respectively:—

	Cubic mètres.
Sandstone	1·69
Limestone...	2·32
Brick (ordinary)	2·83
Tufaceous limestone*	3·64
Brick (loamy and porous) ...	5·12

From these figures we can at least see that the diffusion of air through the pores of walls differs largely according to the material of which the wall is composed, although we may not be able to precisely determine the facility of diffusion afforded by any particular structure, since hardly any two kinds of stone or brick, for example, will give precisely similar results. The thickness of the walls and their hygrometric state, as well as the nature of the material with which they are covered, also largely influence the rate of diffusion.

Further experiments in the same direction have led Dr. Lang to the determination of a series of co-efficients or constants for various materials by means of which the following formula may be utilised for particular cases:—

$Q = \frac{c\,p\,q}{d}$, where Q is the amount of air in litres or cubic decimeters passing per hour through the wall; c, the constant or co-efficient of permeability of the material; p, the wind pressure per square centimetre in kilograms; q, the extent of surface in square centimetres; d, the thickness of the material in mètres.

The co-efficients determined experimentally by Lang for various materials are as follows:—

Sandstone	0·124
Brick	0·203
Plaster of Paris...	0·041
Mortar	0·907
Concrete	0·258
Oak boarding	0·007
Deal boarding	0·010

In calculating for brickwork or stonework in mortar, one-third of the cubic contents of rubble stone wall are assumed to be mortar, one-fifth to one-sixth of brick walls, and one-sixth to one-eighth of ashlar walls, and from this a proportional co-efficient for each can be obtained.

Further, the effect of coating the wall with various media has been determined as follows:—With ordinary oil-paint the amount of diffusion is reduced to three-quarters of the normal; with distemper colour to one-half; with one coat of oil-varnish to two-thirds; with two coats of oil-varnish to practically nil; with tapestry hangings to a quarter or half the normal.

If the substance of the wall is soaked with moisture, the diffusion through it is reduced to one-quarter of that through a dry wall.

From these investigations we learn that there is a considerable, if not accurately determinable, interchange of external and internal atmosphere by diffusion through the pores of walls, ceilings, and floors, varying in extent according to the material of the structure, the difference in density of the atmospheres, whether caused by difference of temperature or by wind-pressure, or otherwise, and also varying with the dryness of the walls. Hence, from this cause, newly-built walls admit of less diffusion than those dried by time, and so we thus have one reason for the superior healthiness of well-dried buildings over those newly-built.

In our first chapter it was noted that a considerable difference exists between the amount of fresh air that has been theoretically considered necessary for each individual, and the amount actually provided by means of applied ventilation in modern practice. We now see that one cause of the diminution of the theoretical amount, or rather one way in which part of the requisite amount is supplied, is by the inevitable diffusion through the enclosure of an apartment. In the ventilation of mines, where diffusion through the enclosure is practically nil, the actual amount of fresh air required, as proved by experience, we have already stated approximates very closely to that arrived at by theoretical deduction.

We have also to take into consideration the further ventilation of an involuntary character which takes place through the imperfect fitting of doors and windows, and which is also an important factor in the question of ventilation as a whole, and particularly as applying to domestic buildings.

* This would be a highly porous limestone, resembling that now being used by Mr. Herkomer for the walls of his new house at Bushey.

GENERAL BUILDING NEWS.

THE ROYAL ENGLISH OPERA-HOUSE. — Mr. D'Oyly Carte's new theatre in Cambridge-circus, at the junction of Shaftesbury-avenue and Charing Cross-road, is to be opened this Saturday, January 31. We gave an external view of the building in our number for the 3rd inst. Mr. T. E. Collcutt has designed the façades, as well as the internal decorative work. The whole of the constructive work has been executed from plans prepared under the superintendence of Mr. G. H. Holloway, who has also superintended the whole of the works, no general contractor being employed, Mr. D'Oyly Carte being "his own builder." The construction is claimed to be absolutely fireproof throughout, and the theatre will not be insured. It is completely surrounded by streets on all sides, and thus there are great facilities for entrance, exit, lighting, and ventilation. The building presents many special points worth noting, but we are compelled, by pressure on our space, to hold over a detailed account of it until next week.

THE KING'S CROSS RESTAURANT. — This new restaurant, just opened by Messrs. Reggiori Bros., is situate in the Euston-road, near the corner of Liverpool-street, and opposite the termini of the Midland and Great Northern Railways, and is one of the best-appointed establishments of its kind in London. It occupies some of the buildings which were until lately private houses, and also extends over the front garden ground, the one-story buildings being brought out to the pavement line of Euston-road. Accommodation is provided for about 140 persons to dine at once in the main *salon*, leading out of which is an annexe having an entrance from Liverpool-street. The whole of the surface of the interior walls and ceilings (where not covered by mirrors) is lined with tiles of Burmantofts faïence of quiet but effective design and colour. The interior is bright and pleasing, and devoid of the garishness so often characteristic of such places. The constructional work has been of a somewhat unique character and of great danger, consisting of throwing three shops and two private houses, all of different levels, into one building. Four of the party walls and also the external walls in some cases have been entirely removed. At one time three of the main walls of one of the structures were removed together, and every wall throughout the block has been underpinned to a depth of some 6 ft. and the internal area excavated to form kitchen, &c. The architect is Mr. Robert Willey, F.R.I.B.A., of Ludgate-hill, assisted by his son, Mr. Francis Willey. The general contractor was Mr. Howell J. Williams, of Bermondsey-street, some of the other firms engaged in the work being as follow:—Tile-work and faience, The Burmantofts Co., Leeds; mosaic, Messrs. Webb, of Euston-road; mirrors, Messrs. W. D. Sims & Co., of Great Eastern-street; culinary appliances, Sig. Ceresa, of Westminster Bridge road; internal fittings, Mr. H. Hanks, of Berners-street; electric-lighting and gasfittings, Messrs. Strode & Co., St. Paul's-churchyard; stained-glass by Messrs. James & Co., of Kentish Town; and lifts by Messrs. Waygood & Co.

ABATTOIRS, DOUGLAS, ISLE OF MAN.—The new public abattoirs, on a site near the railway station, and removed from populous districts, were commenced last week. The buildings are being erected from the plans and under the supervision of Mr. Thomas W. Cubbon, architect, of Birkenhead, whose designs were selected in an open competition some time since. The scheme provides the following accommodation:—Public slaughterhouse, 50 ft. by 25 ft., with lairages at the rear for thirty-six cattle and 114 sheep or calves. Eight private slaughterhouses, each having at the rear lairage accommodation for eight cattle and thirty sheep; general cooling-house or dead meat-market, 125 ft. 6 in. by 25 ft., capable of hanging about 170 cattle carcases and 308 sheep or calves. The pigs' department consists of slaughtering-pen, dressing-house, and cooling-house for about sixty carcases, and having pens for about forty-five animals. A suspected-cattle slaughter-house and lairage and also gut-cleaning premises have been provided. The administrative department includes superintendent's dwelling-house and office; medical officer's room; weighing office; boiler-house, &c. The total cost of the buildings, including concrete foundations, will be about 5,000*l*. They are being carried out by Mr. William Kelly, contractor, of Douglas. Mr. George Cain supplying the ironwork fittings.

HYMERS' COLLEGE, HULL.—On the 21st inst., Alderman J. T. Woodhouse laid the foundation-stone of Hymers' College, Hull. The architects of the new building are Messrs. Botterill, Son, & Bilson, of Hull. We gave a description of the new building, and a double-page illustration of it, in the *Builder* for June 28, 1890.

PROPOSED NEW CORN AND GROCERY EXCHANGE, MANCHESTER.—It is proposed to erect on the present site of the Manchester Corn, Grocery, and Produce Exchange, a building which will provide more than twice the accommodation now available. The site has frontages of 99 ft. to Hanging-ditch, 198 ft. to Fennel-street, and 162 ft. to Half-street, from each of which thoroughfares it is proposed there shall be an entrance to the new Exchange. The new building, which will have a central dome of 84 ft. in diameter, will have an area more than double that of the present Exchange, and by the arrangement of the building ready access can be obtained to every part, while a gallery will be carried round the side walls on which a series of private boxes or offices will be constructed. The present accommodation admits of 250 stands; in the new buildings provision will be made for 690 stands. Designs have been prepared by Mr. Thomas Mitchell, of Manchester.

CHARTER-STREET RAGGED SCHOOLS, MANCHESTER. —The contract for the erection of the Charter-street Ragged Schools, Manchester, has been let to Messrs. Peters & Sons, builders and contractors, of Rochdale, their estimate being 4,280*l*. The architects for the work are Messrs. Maxwell & Tuke, Manchester.

BRISTOL.—The Kingswood Reformatory, near Bristol, is about to be rebuilt from the designs of Mr. H. C. Hirst, architect, of Bristol. The contract for the first portion of the works has been given to Messrs. I. Roach & Sons, of Charfield, Gloucestershire.

EDINBURGH.—It is proposed that the managers of the Edinburgh Royal Infirmary should extend the buildings, in order to provide additional accommodation for the number of outdoor patients, which is increasing; and the site of the Sick Children's Hospital, which adjoins the Infirmary, is considered to be a suitable one for the proposed new buildings. It is known that the Managers of the Sick Children's Hospital intend to erect new buildings, whether on the present site or elsewhere has not yet been determined.

THE CHANCEL OF ST. MARK'S CHURCH, GLOUCESTER. —The chancel of the church of St. Mark, Kingsholm, Gloucester, was consecrated on the 20th inst., after undergoing alterations. Before the alterations the chancel arch was very small and narrow, and the chancel itself was low and dark. The chancel arch has been widened and raised, as has also the arch of the organ chamber, and the chancel walls have been raised about 8 ft. They have also been extended a little more than a yard to the edge of Worcester-parade, and in place of the small window formerly in the east wall a three-light window has been placed. There are also clearstory windows on the south side. The chancel has been entirely re-arranged and paved with Godwin's encaustic tiles, and the choir stalls are new, and of oak and walnut. The altar has been raised. The pulpit is of oak and walnut, with tracery and carved panels, and stands on a carved and moulded Painswick stone base, with steps of the same material. It has been executed and fixed from the architect's design by Mr. Henry Fritb, sculptor, of Gloucester. The whole of the improvements, as well as the pulpit and choir stalls, were designed by Mr. R. W. Drew, of Torquay, and, except the pulpit, have been executed by Mr. Alfred King, of Gloucester.

PAROCHIAL BUILDINGS, KENSAL TOWN. — On Monday last, Mr. C. A. Whitmore, M.P., opened the new block of parochial buildings in connexion with St. Thomas's Church, Kensal-road, W. The new buildings comprise a large central hall, 60 ft. by 26 ft., partly lighted by a lantern running almost the entire length. Meetings, entertainments, &c., will be held in this hall, which is also fitted with complete apparatus for a gymnasium. Upon one side are three separate class or committee rooms, but which, being separated from the hall by Braby & Thornborough's folding shutters, can be utilised as an addition to the hall in a few moments; while a library and reading-room, with suitable offices, occupy the opposite side. At one end is the kitchen, fitted with gas-cooking apparatus, to be used for parochial purposes. The walls are faced with red brick from Gainsborough, the roofs being covered with permanent green slates. The floors generally are laid with Gregory's wood blocks, and the porches and passages with Stuart's granolithic paving. The heating is by Mr. J. Grundy. The architects are Messrs. Demain & Brierley, of York; and Messrs. Thomas Gregory & Co., of Clapham Junction, were the builders, Mr. J. Newton superintending the work as foreman.

NEW PULPIT, AXMOUTH CHURCH.—A new pulpit in carved oak has just been placed on the north side of the nave of the church of St. Michael and All Angels, Axmouth. It is octagonal on plan, and of fifteenth-century style of architecture. The body of the pulpit on each cant is carved with "linen-fold" panels, save in the centre; where, in a niche, is a sculptured statuette, representing St. John the Evangelist bearing a scroll, and having an eagle by his side. The cornice around the top of the pulpit is carved and embattled. The addition to the church is the work of Mr. Harry Hems, of Exeter.

NEW FREE CHURCH, BRAID-ROAD, EDINBURGH.— The foundation-stone of the new Free Church to be erected at the corner of Braid-road and Cluny-drive, in the Morningside suburb of Edinburgh, was laid on the 22nd inst. The church, which has been designed by Dr. Rowand Anderson, is in the pointed Gothic style of architecture, will seat 800 persons, and will cost about £8,500. The builder is Mr. Mekie.

MISERERE, ST. JOHN'S CHURCH, TORQUAY.—At St. John the Evangelist's Church, Torquay, an addition has just been made to the oak choir stalls, which have done duty in the chancel ever since it was built from the designs of the late Mr. Street, more than twenty years ago. In these stalls no distinct accommodation was made for the officiating priest, and a priest's seat, with carved standards, and a raised desk for his use has just been placed upon the south-west end of the stalls. The seat can be turned up or down, and on its under side it is carved, the subject being a pelican feeding her young. On each side is conventional foliage, carved in the thirteenth-century type of architecture. The work has been executed by Mr. Harry Hems, of Exeter.

NEW MISERERES, ST. NICHOLAS'S CATHEDRAL, NEWCASTLE.—One of the last additions made to the Cathedral Church of St. Nicholas, Newcastle, are the miserères placed in the twenty-six canons' stalls within the altar rails. The designs have been carried out by Mr. Ralph Hedley.

NEW CHAPEL AT FISHLAKE, DONCASTER.—A new Primitive Methodist Chapel at Fishlake was formally opened on the 22nd inst. Accommodation is provided for a congregation of 160 at present, but this accommodation will be capable of extension. The architect was Mr. Howdill, of Leeds, the builder being Mr. E. G. Duckitt.

NEW CLOTHING FACTORY, LEEDS.—A new clothing factory, supposed to be one of the largest in the world, has just been opened at Leeds. The new factory, which has been built for Messrs. J. Hepworth & Son, stands at the entrance to Claypit-lane, on the Woodhouse-lane side. It forms an oblong square, 80 yards in length, and half that extent in width; while the three floors and the basement give a total floor space of 100,000 square feet. The new building has been designed by Mr. H. A. Cheers, of Twickenham. The contracts have been carried out by Messrs. John Wood & Son, builders; Messrs. Tomlinson & Sons, carpenters and joiners; Mr. Heavyside, slater; Messrs. Dearden Bros., painters; and Mr. Woffendin, plumber, all of Leeds. Messrs. T. Beecroft & Co. were the engineers. Nearly two thousand tons of timber have been used, and over one hundred miles length of scaffolding and floor boards. The façade of the structure fronts to Claypit-lane. The vestibule, paved in mosaic, leads on the left to the general office, where the windows have insertions of cathedral glass, and the woodwork is of mahogany and pitch pine. At the Grove House-lane corner is the workpeople's entrance, with timekeeper's-office. On the left side of the square is the packing-room. The stock-room adjoining has a length of 82 yards. Outside is space to be covered by dwellings for the staff. On the first floor is the tailoring department. The second floor, lighted from the roof, as well as by side windows, has accommodation for a thousand sewing machinists as well as shops for the mechanics. Close by are the pressing-rooms. The workrooms are heated by apparatus by Messrs. Dawson & Co., Limited, Stalybridge, and a white glazed-brick dado has been adopted for the purpose of cleanliness. In the basement, among other apartments, is the dining-room.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY OF BIRMINGHAM.—The Water Committee of the Birmingham City Council have just now under their consideration a scheme for making an entirely new source available for the water supply of the city. At the October meeting of the Council the committee were authorised to consult with Mr. James Mansergh, C.E., or failing him some consulting engineer, as to the further powers to be obtained by the Corporation with reference to additional works and sources of supply to meet future requirements. In December, Mr. Mansergh attended a meeting of the Water Committee, and subsequently he again consulted with them, and made a verbal report on the scheme which he considered most advisable for them to adopt. This scheme, the *Birmingham Daily Gazette* understands, is a most extensive one, as it involves the tapping of a supply in the centre of Wales. A scheme of this character was recommended to the Corporation by Sir Robert Rawlinson, C.E., as far back as 1871. He recommended that water should be taken from the Rivers Elan and Claerwen in Mid-Wales at an elevation of 900 ft. above the sea level, and should be brought to Birmingham by conduit, supplying other towns on the way. On November 25, Mr. Mansergh, accompanied by Mr. J. W. Gray (the Waterworks Engineer), and by Mr. J. G. Symons, of London, paid a visit to Rhayader to inspect the lower valleys of the Wye and Elan, and traversed an area of nearly 100 square miles of the various watersheds of the district so as to form an idea of its capacity as a collecting ground, if it should be decided to resort to it. Rhayader is about eighty miles from Birmingham, and any scheme for obtaining water from that locality would require to be sanctioned by an Act of Parliament. The reservoir would, in all probability, be situated in the valleys of the Elan and Claerwen. The line of pipes or conduit would probably cross through Radnorshire from near Rhayader to Cross Gates, from thence in the direction of Llanbister and Knighton, afterwards following the general line of the Central Railway Company to Craven Arms, and straight to Birmingham. On the 11th inst., Mr. Mansergh presented a written report to the Water Committee. After some discussion upon it, the Committee adjourned for a fortnight, when it is expected they will be able to come to some decision on the matter, and present a report to the City Council containing their recommendations on the scheme.

NEW WATER SUPPLY FOR COLWYN BAY.—Steps are being taken to secure for Colwyn Bay, Denbigh, a new supply of water from Llyn Cowlyd, situated at an altitude of about 750 ft. on a branch of the Snowdonian range of mountains on the Carnarvonshire side of the River Conway. Considerable progress has been made, and the scheme of Mr. T. B. Farrington, Borough Surveyor of Conway, has been accepted, the expenditure involved being 21,000*l.* At a meeting of the Joint Committee just held, Mr. T. T. Marks, C.E., Clerk and Engineer to the Llandudno Improvement Commissioners, who had been engaged to make a report on Llyn Cowlyd, stated that the more he examined the scheme, the more certain he was of its success. It would, when completed, afford the finest water supply in North Wales.

STAINED GLASS AND DECORATION.

FOLKESTONE CHURCH. The parish church of Folkestone has recently received another large addition to its decoration, the execution of which has occupied some weeks. The design takes the form of the "Tree of Jesse," occupying the entire east wall of the north transept leading into the Lady Chapel; it represents Jesse lying asleep, and rising from him is a tree bearing on its branches his descendants, figures of Kings of Israel, little short of life size, among delicate foliage work; the tree terminating with the Blessed Virgin and Child, St. Joseph, and Jacob his father. Two angels hold a dossal behind the Virgin, and three angels flying forward, beneath their feet bearing the text, "Of Whom was born Jesus who is called Christ." The whole has been designed and executed by Mr. Alfred O. Hemming, of London, who is the artist of the picture-painting and decorations throughout the nave, embracing the stations of the cross, which we illustrated in our issue of August 23 last year.

NEW WINDOW, COLTNESS CHURCH, NEWMAINS, N.B.—In this church there has just been placed a stained-glass window in memory of Mr. Arthur H. Houldsworth. The window is a two-light one, and consists of four panels, each typical of an act of mercy. The design is by Mr. Stephen Adam, of Glasgow.

FOREIGN AND COLONIAL.

FRANCE.—M. Meissonier's health has prevented his retaining the presidency of the Société Nationale des Beaux-Arts, and he has delegated his office to M. Puvis de Chavannes.——The resignation of M. Antonin Proust as President of the Union Centrale des Arts Decoratifs is also announced. This step has arisen out of a difference of opinion in the Society in regard to the possession of the Palais des Beaux-Arts on the Champ de Mars.——M. Joseph Felon has been nominated by the Minister of Public Instruction as Professor of Decorative Composition at the National School of Decorative Art at Nice, and M. Corbel has been appointed Professor of Sculpture at the National School of Decorative Art.——Madame Spitzer, widow of the celebrated collector, has given to the Louvre Museum a reliquary of the fourteenth century, in rock crystal and adorned with enamels. It is Spanish work, with the arms of France, Anjou, Aragon, Castile, and Léon. It will be exhibited in the Galérie d'Appollon shortly.——A committee has been formed to erect at Gennevilliers, where the Paris sewage effluent is now in use for agricultural purposes, a monument to Alfred Durand-Claye, the engineer to whom the recent sanitary works in Paris are chiefly due.——A statue of General Faidherbe is to be erected at Bapaume, the sculpture by M. Louis Noël and the architectural portion by M. Georges Debrie.——The Jury on the competition for a Theatre at Saint Nazaire have pronounced judgment on the 17 competitive designs. The first premium has been given to M. Pierre Pecaud of St. Nazaire, the second to MM. Deperthes et fils of Paris, the third to MM. Bergon of Paris and Mardion of Tours.——The Société Académique of Lyons has given judgment on the various competitions of 1890. In architecture a gold medal has been given to M. Puchianti of Lyons, and an honourable mention to M. A. Garnier of Paris. For the archæological competition, M. Paul Porte of Lyons has obtained a gold medal.——A competition has been opened at Commercy for the establishment of water supply works for that town.——A new Lutheran Church has just been inaugurated at Neuilly-sur-Seine.——The Cercle Artistique et Littéraire of the rue Volney opened its annual exhibition on Monday last.——A new free architectural atelier is opened under the title of the Atelier Wable. Pupils preparing for the École des Beaux-Arts are admitted there.——The Ministry of Public Works has in preparation two décrêts the object of which is the re-organisation of the Conseil Supérieur des Bâtiments Civils.——A fire has done serious injury to the Hôtel de Ville of Havre, a pretty Renaissance edifice built in 1855 by Brunet-Debaines.——M. Nicholas Soultanoff, Professor of History and Architecture at the Institute of Civil Engineers of St. Petersburg, has been giving, at the Society of Antiquaries at Paris, an exceedingly interesting lecture on Russian Art and the characteristics of its different epochs.——Fifty years ago the celebrated Russian painter Alexis Bogoluboff, having quitted the navy in which he was then an officer, entered the École des Beaux-Arts as a pupil; he gained the Prix de Rome four years after, and has since obtained many successes both in France and Russia. The Russian colony in Paris has given a fête to celebrate his artistic jubilee, at which the Russian Ambassador and all his staff were present.

SWEDEN.—The Stockholm Academy of Fine Arts invites Swedish architects to compete with designs and plans for a new building. One prize of 2,000 kr., one of 1,500 kr., with an additional 500 kr. for purchase, are offered.——The Municipality of the town of Malmö has adopted the same regulations for the erection of buildings as those recently framed by the Stockholm Building Board, at the time quoted in our columns.——Herr P. A. Lindahl, civil engineer, has returned from a visit to the latest Continental theatres, undertaken at the expense of the syndicate building the opera house in Stockholm, for the purpose of studying their construction, ventilation, lighting, and safety arrangements. He considers that the most perfect in every respect are the Hofburg Theatre in Vienna and the two new theatres in Prague and Budapesth. These will, therefore, be taken as models for the new Swedish house. He found German and French theatres far behind the former. Even at the great Paris Opera House there is no iron curtain, only one of woven steel wire, which would permit smoke to pass through. Nor do the seats in the stalls lift up, and the electric light leaves much to be desired. The Stockholm Opera House is estimated to cost 220,000*l.*, a very large sum considering this city has only some 250,000 inhabitants.——A case of jerry building has just occurred at Stockholm, the entire fabric of a dwelling in course of construction suddenly collapsing. Fortunately, no one was on the premises at the time. It appears that the regulations laid down by the Building Board as regards the strength and erection of the iron columns and balks had been ignored, in consequence of which the builder and the owner are to be prosecuted. Swedish journals consider that the catastrophe again proves the necessity for stringent building laws.——A Swedish journal also draws attention to the careless manner in which the estimates were prepared by the city architect for two new public schools just completed. In one case the cost has exceeded the estimate by 7,500*l.*, and in the second by nearly 9,000*l.*——A sample office of Swedish manufactures is to be established at Rio de Janeiro, similar to the one at Buenos Ayres. Specimens of wooden villas, which are finding much favour in South America, are to be shown, as well as building timber, planed wood goods, iron, &c. It is curious that, although wood is so cheap in Sweden, only a single thoroughfare in Stockholm, the Vasobro, is laid with this material, which has lasted ten years. As several thoroughfares are to be relaid with stone or asphalte, the *Aftonblad* urges the use of wood instead, as in other capitals of late years.——The Eefdals porphyry quarries, whence some of the handsomest stone found in Sweden is obtainable, are to be reworked after some years of disuse.—A municipal electrical station is to be established in Stockholm at a cost of 75,000*l.*——Attention is drawn in an insurance journal to the dangers from fire in wood-pulp factories through the manner in which they are constructed.

DENMARK.—The last number of the official Danish *Gazette* contains an exhaustive report of some tests carried out in 1889-90, with samples of native mortar, under the direction of the Minister of the Interior.——The report of the Copenhagen Building Association of workmen is very favourable. It now numbers 16,372 members, and has erected since its formation 812 dwellings, in which over 7,000 persons reside. In addition, a sum of 16,000*l.* has been expended on land for 420 houses more.——The estimated cost of the new "free port" to be constructed at Copenhagen by the Government has been reduced to 555,000*l.* A company with a capital of 220,000*l.* is to work the concern.——A company has been formed for working the valuable granite quarries in the island of Bornholm, and to construct a port for exporting the stone. Some 800 hands will be employed.

TOKIO.—The provisionary Japanese Houses of Parliament buildings, which were only opened November 29 last, have been destroyed by fire. The block, covering 4,000 square mètres of ground, with a frontage of 110 mètres, had been erected according to the designs of Messrs. Ende & Boeckmann, of Berlin, under the direct supervision of Professor Ende. The building destroyed was a half-timber one, two stories high, showing but little attempt at decoration. Its cost was 20,000*l.* The halls of both Upper and Lower "Houses" had some 350 seats each, placed in semi-circular rows.

HALLE.—The historical old castle, the Moritzburg, now in ruins, is to be restored, and the halls to be used as drill-halls and gymnasiums and the chapel for the Church-examination purposes. The castle was commenced 1484, the chapel 1509.

CHINA.—A new hotel, "The Austen Arms," has been built on the Hong Kong Mountain, 1,500 ft. above the level of the sea. All materials required had to be carried up on the backs of coolies. The building is constructed of red bricks and stucco, with columns, capitals, &c., of granite. The roof is covered with red Chinese tiles, and the floors of the balconies and corridors laid with patterned tiles and red bricks. All the woodwork on the first floor is of Indian teak, and in the upper ones of hard Singapore wood and Chinese fir. The walls of the great assembly room are supported by iron columns and dragons' heads manufactured by Messrs. H. Young & Co., of Pimlico. There are besides a great dining-room, reading and smoking-rooms, as well as private dining and sitting-rooms, and about sixty bedrooms. All the latter have a separate bath-room attached. The building work has been carried out entirely by Chinese, the architects being Messrs. Danley, Leigh, & Orang, of Hong Kong. The cost has been 25,000*l.*

RANGOON CATHEDRAL.—There are prospects of this structure being pushed on towards completion. The building was started some five years back—the foundation stone being laid by Lord Dufferin during his visit to Burma, and after being raised some 18 ft. the works were stopped for want of funds. Sanction has now been obtained from the Government of India to demolish the old Pro-Cathedral on the strand and to sell the material and lands for the purpose of raising funds to meet expenditure on the new works. Most of the decorative items have been purchased and are now lying at the works, and it is to be seen how long more the Protestant public will have to wait for this long-promised edifice (specially designed by Mr. Chisholm) to become an accomplished fact. The Catholic ecclesiastics appear to have a better system in regard to building churches. The cathedral begun in Mandalay some two years after the former is almost completed.—*Indian Engineering.*

BERLIN.—At a well-attended meeting of the "Architekten Verein," on Monday last, Professor F. Adler gave a lecture on Dr. Schliemann's life and the results of his excavations. In the course of the lecture, the Professor showed a very exact knowledge of the Schliemann work; he is an enthusiast as to his achievements, and strongly opposed to Captain Boettcher's ideas of the discoveries, which he treated with sarcastic contempt.——Berlin's first monument to the memory of Emperor Frederick III. has been unveiled; its situation is in front of the head police offices.——The competition for the design of a memorial monument to Emperor William I., to be erected at Frankfort-on-the-Maine, has been decided, the jury awarding three equal prizes (of 200*l.* each) to Messrs. Maison & Romeis (Munich), Buscher (Duesseldorf), and Werner Stein (Leipsic). Fifty-one designs had been sent in: some of the best, however, had to be excluded for infringement of the conditions.——A fire, which might have been of serious consequence to the progress of the new Houses of Parliament, in course of erection, broke out at the Government Drawing Offices situated on the site, but was luckily extinguished without loss of a single drawing. The fire-brigade, which feared a spreading of the fire to the scaffolding of the block (insured at 200,000*l.*), mustered in great force, but were scarcely required. ——The sudden thawing of the snow (which had been left in the roadways for sledging purposes) whilst the gullies are still frozen, has caused great inconvenience. In some streets the water stood 6 in. to 18 in. deep, and many cellars are flooded.

MISCELLANEOUS.

THE NATIONAL REGISTRATION OF PLUMBERS.—The *British Medical Journal*, in commenting upon the movement for the education, examination, and registration of plumbers, says:—"The President of the Local Government Board has set the seal of his official approval upon the movement, and many of the leading municipalities now require that persons engaged in plumbing work on their behalf shall hold a certificate of registration of the Plumbers' Company, implying efficiency. The time must now surely be near at hand when the further step may be taken to complete the scheme to give the sanction of an Act of Parliament to the register, and to give the required protection to the public by protecting the title of registered plumber, so that none others shall assume it than those who have been duly examined and certified. Meantime it is highly satisfactory to see that public opinion has been sufficiently energetic, and the trade sufficiently enlightened, to lead to so large an amount of voluntary registration."——At Sunderland, on the 26th inst., the Mayor presided over a crowded public meeting held in the new Municipal Buildings. Professor Garnett, principal of the Durham University, delivered a lecture on "Modern Sanitary Appliances," and gave a series of limelight illustrations of defective apparatus met with in several typical houses. Referring to the technical and scientific education of plumbers, Professor Garnett said there was nothing so well calculated to develop habits of thought as oral class teaching, in which the students were called upon to point out defects in appliances sketched on the blackboard, and to give their reasons for considering the apparatus defective. On the motion of Dr. Harris, Medical Officer of Health, the following resolution was passed:—

"That this meeting desires to record its opinion that it is essential to the health and comfort of all classes of the community that the plumbers' craft should be brought under such regulation and control as to ensure the efficient training of its members, and that this can be best effected by the system of national registration, which requires plumbers to pass qualifying examinations; and that the meeting further desires to direct the attention of Parliament to the necessity for legislative enactments to effect these objects."

DOCKS IMPROVEMENTS AT BRISTOL.—The Bristol Docks Committee had under consideration, at their meeting on the 12th inst., a report from the Engineer relating to matters connected with the practical working of the Dock Estate. These included, amongst others, a new system of dredging by means of hydraulic jets; alterations to the 35-ton crane on the Harbour wharf; and the provision of hydraulic cranes on the city quays. Ultimately the committee resolved to report to the Council in favour of providing a system of hydraulic cranes round the city quays, at an estimated cost of about 4,000*l.* With regard to the proposed alteration to the 35-ton crane on the Harbour wharf, it was resolved not to undertake the work at the present time. The plan of hydraulic dredging by Tydeman's system was approved.

ROYAL VICTORIA HALL.—The following arrangements are announced for science lectures at the above Hall:—February 3—"From Dry Bones to Useful Material," by Mr. Ward Coldridge; February 10—"Plants and Animals of the Coal," by Professor H. G. Seeley; February 17—"Our Chalk Hills," by Mr. F. W. Rudler; February 24—"A Trip to New Zealand," by Professor Hall Griffin.

A GIGANTIC BUILDING.—The foundation-stone has just been laid of an immense building at Cook, in the United States, on the corner of State and Randolph-streets. The structure will be 275 ft. in height, and contain twenty stories, the cost being estimated at about 445,000*l.* To give an idea of the size and requirements of the building, it may be mentioned that the elevators are calculated to carry 45,000 persons a day. The building is intended chiefly for business purposes, and is to be finished by the middle of next year.

THE DEMOLITION OF THE SCARBOROUGH "BAR." A correspondent writes to the *Leeds Mercury*:—"Now that the demolition of the 'Bar,' the structure situated in the main thoroughfare of Scarborough, which was erected in 1843 in replacement of a very ancient bar and prison on the same site, and which has long proved an obstruction to traffic in this busy part of the town, is an accomplished fact, and the demolition of the adjacent shops and offices is in active progress, the immense value of the improvement, when fully completed, may be gauged. The total width of the road and pathways will be increased from 25 ft. 9 in. to 50 ft., and this will extend for 82 ft. Moreover, within a few yards' distance an hotel, one of the largest in Scarborough, is being erected on the site of the old Bull Hotel, and at the corner of Huntriss-row (opposite) the London and Yorkshire Banking Company are having premises built. Each structure is in the Flamboyant style of architecture. The whole appearance of this particular part of the town has been changed, and a great surprise awaits those forthcoming visitors who had become familiar with the old order of things."

THE SOUTH LONDON ELECTRIC RAILWAY.—At the evening meeting of the Inventors' Institute on January 14, Mr. C. E. Spagnoletti, the electrician of the Great Western Railway, gave an account of the electric locking and block system, in use on the South London Electric Railway. The description was the more interesting that it was illustrated by a full set of levers and instruments representing the details of two actual stations and the intermediate section of railway line guarded by this electric block system. The normal position of the levers and the signals is at danger; and in this position each of the levers is locked by a plug worked by the electric current. Thus the train cannot enter the guarded section whilst the signals are against it. Before the signalman at the entering station can release his signal, he must ask, by bell message, the signalman at the station in advance to liberate the lock. If the section is clear, the advance signalman will send an electric current from the instrument in his cabin, and unlock the applicant's lever, who then lowers his signal, lets the train through, and puts his lever back to its normal position. He cannot let another train follow, because the lever of his signal is locked. Neither of the signalmen can now move their levers until the train has reached the end of the guarded section of the line, when it passes over a tripper connected to the rails, and which automatically sets the current instruments. Every fresh action of a signalman necessitates, in the first place, a bell-message to a second signalman; secondly, an electric unlocking current transmitted from the advance signalman; and thirdly, the automatic setting of the electrical instruments of current transmission. These safeguards provide against human errors. No signalman can act under any misapprehension, because another signalman controls him; and the two men cannot concurrently commit an error, because neither can act at all until the train itself has cleared the means of working the signals by its own final performance in passing the end of the guarded section of the railway. No two trains can, therefore, run on the guarded section at the same time. Should any derangement of the electric instruments take place, the safety of the system is not affected, because the derangement locks up everything in the normal position of danger warning. The line can then, under the guidance of the inspector, or other authorised officer, be worked in the ordinary mechanical way. This electric system is in use on several lines, and working most satisfactorily. The very intricate crossings of railways at King's Cross Junction, where the Great Northern and Midland trains pass athwart the main lines of the Metropolitan Railway, are protected by this system in a most efficient manner, allowing the trains to pass with a rapidity of succession unattainable by any other means. The meeting was largely attended by railway officials and electricians, and the subject elicited very great interest.

THE INTERNATIONAL CONGRESS OF HYGIENE.—Sir George Harris, L.C.C., Mr. H. H. Collins, F.R.I.B.A., and Mr. Mark H. Judge, A.R.I.B.A., have been elected to represent the Paddington Vestry at the International Congress of Hygiene.

THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN.—The eighth annual dinner of this Association will be held at the Holborn Restaurant, on Saturday, February 7, Dr. B. W. Richardson, F.R.S., &c., President, in the chair.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY.—The annual meeting of this Society will be held at the Chapter House, St. Paul's Churchyard, this Saturday, January 31, at 2.30 p.m.

THE SOCIETY OF ENGINEERS.—The first ordinary meeting of this Society for the year 1891 will be held on Monday, February 2, at the Town-hall, Westminster. The President for the past year, Mr. Henry Adams, will present the premiums awarded for papers read during the year, and the President for the year 1891, Mr. William Newby Colam, will deliver his inaugural address.

THE WHITECHAPEL CRAFT-SCHOOL.—We have received a prospectus of a handicraft school established under this title at 27, Little Alie-street, Whitechapel. Mr. T. Eadie Reid holds a class in practical decoration on Wednesday evenings at 8, and Mr. A. J. Dymott a class in carving and modelling on Friday evenings at the same hour. The first-named classes are specially intended to meet the needs of lithographic draughtsmen, sign-painters, house-decorators, &c., and the class of carving for wood-carvers, cabinet-makers, stone-masons, sculptors, &c. Both men and apprentices are invited to join. The hon. secretary is Mr. Llewellyn Smith.

SANITARY PROGRESS IN INDIA.—One of the results of the recent high death-rate in Madras and the agitation that ensued has been the formation of a Public Health Society, which held its inaugural meeting a few days ago. The address, which was read by Surg.-Major W. G. King, Deputy Sanitary Commissioner, was a model of common-sense, and should be printed by Government and distributed to every district and municipal officer throughout the length and breadth of India. He premised by pointing out the very limited extent to which Government could at present influence sanitation in the country. The Sanitary Board, consisting of the Sanitary Commissioner and the Engineer, assisted by district medical and sanitary officers, can bring a certain amount of influence to bear on local bodies, but is incapable, both from the absence of the necessary legislation and of the necessary staff, to enforce its advice. The speaker, however, thought we might look forward to the time when "a large and skilled staff of medical and sanitary officers, engineers, and nuisance inspectors, supported by well considered laws, would be responsible for the investigation and prevention of disease throughout the Presidency." He admitted that such a centralisation of authority would not be in accord with the present principles of the administration of the country and the encouragement of local self-government, but maintained that "until every member of a local body is capable of giving an opinion founded upon special education as to the merits of sanitary and engineering advice, it must seem at least reasonable that their discretion should be subject to skilled control." The existence of such a department would not, however, conflict with the objects of the society now established, for, while it would be the duty of the former to labour in producing elaborate schemes for water-supply, drainage, conservancy, and the structure of dwellings and towns, it would be the province of the latter to aid in combating disease, the result of individual ignorance or apathy, and with this object the society should include members resident in all parts of the mofussil.—*Indian Engineer.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
Free Public Library	Brechin Town Council	Not stated	Feb. 16
Methodist Chapel, Newton Heath, Manchester	W. Haddocks	do.	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Fire Escape	Barnsley Union	*Official*	Feb. 2
Bridge Ironwork	Madras Railway Co	do.	Feb. 3
Steel Rails, Fishplates &c.	India Office	do.	do.
Street Improvement Works	Bootle Corporation	do.	do.
Additions to New Lan Hotel, Pontypridd		E. M. Bruce Vaughan	do.
*Works and Materials	Westminster Vestry	C. R. W. Wheeler	do.
*Roadmaking Works	Tottenham Local Bd.	J. E. Worth	do.
*Cast-iron Water Pipes	Brampton U.R.S.A.	J. Reay	Feb. 4
*Road Materials	Hull Corporation	*Official*	do.
*Works and Materials (one year)	Hampstead Vestry	C. H. Lowe	do.
Alterations to Police Station, Willert-st	Manchester Corp.	*Official*	do.
Timber of various kinds	Admiralty	do.	do.
Wrought Ironwork for Bridge	Belfast Corporation	do.	do.
Two Houses Horsforth, Leeds		C. F. Wilkinson	do.
Villa Residences, Gloucester		J. Fletcher Trew	Feb. 5
Three Cottages, South-street, Carlisle	Wilson Buckle	do.	do.
Iron Ash-boxes, &c.	Bristol U.S.A.	*Official*	do.
*Battery and Drill Shed, Greenock	Admiralty	do.	Feb. 6
Main Brick Sewer	Sheffield Corporation	G. Aleing	do.
Additions to Business Premises, Cragliead, Chester-le-street		J. W. Rountthwaite	do.
Paving Works	Stamford U.S.A.	J. Richardson	do.
*Building Works	M. R. Co.	*Official*	do.
Enlargement of Works and Foundry, Halifax		T. Lister Patchett	Feb. 7
Impounding Reservoir, &c. near Waterfoot, Newchurch	Burr Corporation	J. Cartwright	do.
Cement (200 tons)	Warrington Twn Coun.	T. Longdin	Feb. 8
*Supply of Road Materials	Com. of H.M. Wks, &c.	*Official*	do.
*Erection of Public Conveniences	London County Council	do.	do.
*Purchase and Pulling-down Building Mat.	School Bd. for London	do.	do.
*New Hospital, North Heigham	Norwich Corporation	P. F. Marshall	Feb. 10
*Works and Materials	Battersea Vestry	J. T. Pilditch	do.
*Building a Weir, &c. &c.	London County Council	*Official*	do.
*Alterations and Additions to Boiler-house Sewerage Works, Flushing Tank, &c. Wooler	do.	do.	do.
	Glendale Union R.S.A.	do.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Brick Gasholder Tank	Congleton Corporation	T. Newbigging	Feb. 10
Church, Lecture Hall, &c. Portadown, Ireland	Committee	Young & Mackenzie	do.
*Silicated Stone Pipe Sewer	East Ham Local Board	W. H. Savage	do.
*Additions, &c. to Eastern Fever Hospital	Met. Asylums Board	Keith D. Young	Feb. 11
Fifty Houses, Aberdare Junction	Ynysfeirig Build. Club	A. O. Evans	do
Office and Workshop, Oakham	Rutland County Council	J. Richardson	do.
Paving Flagging, &c.	Castleford Local Board	*Official*	do.
Gasholder Tank	Hartlepool Gas and Water Co.	Thos Bower	do.
*Alterations and Repairs to Houses	London County Council	*Official*	Feb. 12
*Purchase and Removal of Old Metal	do.	do.	do.
*Alterations, &c. Bournemouth Post office	Com. of H M Wks. &c.	do.	Feb. 13
*Roadmaking Works, &c	Sevenoaks Local Board	Jabez Mann	do.
*Removal of Road Sweepings, &c	St. Pancras Vestry	W. B. Scott, C.E.	Feb. 16
*Supply of Road Materials, &c	do	do.	do.
*Broken Granite, Granite Siftings, and Flints	Dover Town Council	*Official*	Feb. 17
New Boiler and Alterations at Infectious Diseases Hospital	Portsmouth U.R.A.	do.	do.
New School, Southsea	Portsmouth Sch. Bd.	C. W. Bavis	do.
*New Municipal Buildings	Sheffield Corporation	E. W. Mountford	do.
*Alterations and Additions to Infirmary	Salisbury Infirmary	J. Harding & Son	Feb. 20
*New Cemetery	Willesden Burial Bd.	C. H. Worley	Feb. 21
*Police Station and Lock-up House	Breconshire C. C.	*Official*	do.
*Hospital Pavilion, Additions, &c.	Wolverhampton Corp.	do.	Mar. 3
Waterworks (large contract), Nenagh, Ireland	Guardians	Gill & Son	Mar. 5
*Works and Repairs to Public Buildings in London	Com. of H.M. Wks, &c.	*Official*	do.
*New Bank Premises, Cambridge	Messrs. Foster & Co	A. Waterhouse	No date
Alterations and Enlargement of Church, Knaresdale, Newcastle-on-Tyne		Hicks & Charlewood	do.
Additions to Hospital, Sheffield	Sheffield Corporation	J. D. Webster	do.
*New Buildings, Sheerness-on-Sea		W. M. L. Seaman	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Inspector of Nuisances	Hanley Corporation	104*l.*	Feb. 3
*Temporary Clerk of Works	Fulham Vestry	2*l.* 2*s.*	Feb. 12

Those marked with an Asterisk (*) are advertised in this Number. Contracts, pp. iv., vi., *and* viii. *Public Appointments, p.* xx. *and* xxi.

"BULIMBA," SEVENOAKS.—We are asked to mention that in this house, illustrated in the *Builder* last week, the windows were all fitted with Hope's steel casement frames.

LIVERPOOL ENGINEERING SOCIETY.—On Wednesday, January 21, a large number of the members of this society paid a visit of inspection to the Central Station of the Liverpool Electric Supply Company in Highfield-street, Liverpool. On the arrival of the party at the works, they were met by Mr. A. Bromley Holmes, M.Inst.C.E., the Engineer to the Company, who personally conducted them through the station, and explained the nature and working of the machinery and appliances there in operation for the supply of electricity for lighting and other purposes. Later in the evening, the fifth ordinary meeting of the session was held at the Royal Institution, Colquitt-street, Mr. James Morgan, Vice-President, in the chair, when a paper was read by Mr. A. Bromley Holmes, descriptive of the works of the Liverpool Electric Supply Company. An interesting discussion followed, and a vote of thanks to Mr. Holmes terminated the proceedings.

THE ENGLISH IRON TRADE.—While there has been a partial recovery in the English iron market, and its tone is slightly stronger, it cannot be said that there is much more business stirring. Enquiries for pig-iron are becoming more numerous, but sellers are not very eager to effect sales, urging that, with fuel and wages high, they will be losers by any arrangements they may make for forward deliveries at present rates. It is expected that when, with more open weather, shipments grow, a rise in values may follow. Scotch warrants have been tolerably steady during the week, and Cleveland pig shows a slight rise, but hematites are weaker. Although there is here and there a little more demand for finished iron, prices do not improve, the tendency being rather the other way. There is not much doing in steel, with prices cut very fine. Shipbuilding is quiet, but engineers continue fairly active.—*Iron.*

LEGAL.

LIBELLING A SURVEYOR.

HISCOCKS *v.* HARRIS.

THIS case, tried in the Queen's Bench Division on Wednesday last, before Mr. Justice Grantham and a common jury, was an action to recover damages for a slander uttered on March 10, 1890, at a meeting of the Vestry of St. George-the-Martyr at Southwark, to which body the plaintiff is Surveyor, and of which the defendant was at the time a member. There was a meeting summoned by the members of the Board on that day for the purpose of reorganising the Surveyor's department, and the plaintiff complained of the following words as spoken by the defendant:—"It was a dishonest transaction and a shameful piece of jobbery on the part of the Surveyor (meaning the plaintiff) to certify the amount, and the Surveyor (the plaintiff) should be called upon to resign," meaning that the plaintiff was a dishonest man and unfit to hold the post of Surveyor.

The case for the defendant was that he was actuated by a desire to protect the ratepayers' pockets, and that the expenses of the Surveyor's department had been excessive, especially in the items of the sharpening of tools and buying new ones, and altering a shed into a smithy, that the Vestry might do their own sharpening on the premises.

The jury found a verdict for the plaintiff, damages 150*l.*

His Lordship gave judgment accordingly, and refused a stay of execution.

MEETINGS.

SATURDAY, JANUARY 31.

Royal Institution.—Mr. W. Martin Conway, M.A., F.S.A., on "Pre-Greek Schools of Art." II. 3 p.m.

St. Paul's Ecclesiological Society.—Annual Meeting, 2.30 p.m.

MONDAY, FEBRUARY 2.

Royal Institute of British Architects.—(1) To receive the announcement of the name of the person the Council propose to submit to her Majesty the Queen as the recipient of the Royal Gold Medal. (2) Paper by Baron Henry de Geymuller on "The School of Bramante and its Expansion throughout Italy and the rest of Europe." 8 p.m.

Surveyors' Institution.—Adjourned discussion on Professor J. Wrightson's paper on "The Basis of the Cost of Wheat-growing." 8 p.m.

Society of Engineers.—The President, Mr. W. N. Colam, will deliver his Inaugural Address. 7.30 p.m.

University College (Archæology).—Mr. W. St. Chad Boscawen on "Babylonian Archæology and Art." III. 5 p.m.

Clerks of Works' Association (Carpenters' Hall).—Monthly Meeting. 8 p.m.

Royal Institution.—General Monthly Meeting. 5 p.m.

Victoria Institute.—Mr. W. St. Chad Boscawen on "Recent Results of Babylonian Archæology." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. A. J. Hipkins, F.S.A., on "The Construction and Capabilities of Musical Instruments." II. 8 p.m.

Liverpool Architectural Society.—Mr. E. P. Warren, on the "History of the Hearth." 7 p.m.

TUESDAY, FEBRUARY 3.

Institution of Civil Engineers.—Messrs. Llewelyn B. and Claude W. Atkinson on "Electric Mining Machinery." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. H. Law on "Principles of Calculating Areas, Cubic Space, &c.: Interpretation of Plans and Sections to Scale." 8 p.m.

Society of Biblical Archæology.—(1) Paper by the President, Mr. P. le P. Renouf. (2) Mr. B. T. Evetts on "The Canephoros in Early Chaldæan Art." 8 p.m.

Manchester Architectural Association.—Mr. H. Ross on "Houses for Working Men." 7.30 p.m.

Glasgow Architectural Association.—Mr. C. R. M'Intosh on "Scotch Baronial." 8 p.m.

WEDNESDAY, FEBRUARY 4.

South Kensington Museum (Lecture Theatre).—Mr. Maurice Hewlett on "The Rise of the Renaissance in England." V. 3.45 p.m.

Civil and Mechanical Engineers' Society.—Mr. Horatio Daniell on the "The 'Jerome' Steamship Shaft" 7 p.m.

St. Paul's Ecclesiological Society.—Mr. Andrew Oliver on "Brasses in City Churches." 7.30 p.m.

British Archæological Association.—(1) Mr. Andrew Oliver on "Brass Monuments in the Ancient Churches of London." (2) Mr. J. H. Macmichael on "Tradesmen's Signs of Old London." 8 p.m.

Society of Arts. Mr. J. E. Dowson on "Decimal Coinage, Weights, and Measures." 8 p.m.

Liverpool Engineering Society.—Mr. J. Boult on "The Phenomena of Tidal Rivers." 8 p.m.

THURSDAY, FEBRUARY 5.

Royal Archæological Institute.—(1) The Baron de Cosson, on "Arsenals and Collections of Armour and Arms in South Germany and Austria." (2) Mr. G. M. Atkinson, on "Rubbings of Marks on Eastbourne Old Church." 4 p.m.

Institution of Civil Engineers.—Students' Visit to the Refrigerating Machinery at the Victoria Dock, E. 2 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, FEBRUARY 6.

Architectural Association.—Mr. J. M. Brydon on "The English Renaissance of the Eighteenth Century." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Louis Parkes on "Water Supply: Drinking Water, Pollution of Water." 8 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Some Applications of Photography." 9 p.m.

SATURDAY, FEBRUARY 7.

Royal Institution.—Mr. W. Martin Conway, M.A., F.S.A., on "Pre-Greek Schools of Art." III. 3 p.m.

Association of Public Sanitary Inspectors.—Annual Dinner, Holborn Restaurant. 6 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." I. 4.15 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

2,509.—STOCKS FOR BORING-BITS: *J. Gutmann.*—The boring-bit is, according to this invention, held in the socket of the stock by means of a number of wedges moving in radial converging guide grooves formed in the socket. The wedges, being subjected to an equal degree of pressure, are caused to press with equal force against the boring-bit. The wedges are pressed along their guide grooves by means of a nut, and formed with a face adapted to press against the lower ends of the wedges. In the socket is a disc guided vertically by a pin and bearing against a spring, which constantly presses the wedges against the face of the nut. To fix a boring-bit in a stock of this construction, the socket from which the nut is unscrewed is inverted, when the wedges and the boring-bit will rest on the disc; the nut is then screwed on, when the disc will by means of the wedges be pressed downwards, which movement will be followed by the boring-bit until the wedges grip and jam it. To prevent the wedges leaving the groove sideways, they are formed partly flat, with an enlarged portion at the back which enters the groove.

2,021.—CUTTING OR SAWING STONE: *S. W. Dearden.*—In horizontal saw-frames it is claimed by this specification that an improvement is effected by fixing a vertical head in front of the machine at right angles to the saw-frame to which it is adjustably attached. The saws are better able to perform the sawing than when the end of the saw-frame is being constantly raised and depressed by the crank through the varying angles of the crank arm attached to the saw-frame in the ordinary method.

15,953.—CONVERTIBLE LADDERS AND TRESTLES: *J. H. Heathman.*—The main ladder which is the sub-

ject of this patent is made tapering to a wide base, and parallel grooved strips are fixed down behind the rungs; tongue-pieces are fixed to the lower part of the sliding ladder to travel in the grooves. The extension is controlled by a cord. A pair of horns are fixed to the main ladder, and carry a bolt which serves to guide and hold in position the sliding ladder; or the bolt can be withdrawn and passed through the horns and holes in the slide ladder to form a hinge upon which such sliding ladder may open out to support the main ladder, and therewith form trestles.

18,153-7.—DIES FOR ROLLED WOOD AND OTHER SCREWS: *C. D. Rogers.*—The improvements to which this specification relates are in the form of the dies, and in the arrangement of ribs and grooves for special patterns of rolled screws.

NEW APPLICATIONS FOR PATENTS.

January 12.—538, E. & E. Kerry, Burglar-cheater and Draught-excluder.—548, G. Lyons, Sliding Windows.—554, J. Burnett, Warming and Ventilating Buildings.—570, T. Davey, Metal-fencing.—575, J. Vaughan, Sliding-sashes.—591, E. Goupil, Construction of Houses and other Buildings.—592, T. Oliphant and others, Ventilators.—596, E. Wright, Fireplaces and Cooking-ranges.—599, A. Boult, Draught-excluders.

January 13.—631, C. Day, Supply Air to, and the Prevention of Smoke from Fireplaces.—659, J. Stidder, Water-closets, Urinals, &c.—665, W. Deeming, Sanitary-pipes, &c.—684, W. Astrop and F. Parker, Manufacture of White Lead.

January 14.—704, H. Dixon and H. Cohen, Veneering.—716, C. Vasmer, Ventilating and Heating Rooms.—725, R. Winsch, Construction of Bridges.

January 15.—747, W. Reddish, Fire-grates.—752, W. Mather, Imitation of Inlaid Woods.—757, A. Carns, Disinfecting Apparatus for Water-closets.—787, J. Russell, Stove-grates.—789, J. Gibson, Window Sashes and Frames.

January 16.—820, T. and J. Holt, Flushing Cisterns for Water-closets, &c.—832, J. Martin, Raising and Lowering Sash-windows.—839, A. Hunter, Sash Lifter and Fastener for Windows.

January 17.—900, W. Wade, Tiles.

PROVISIONAL SPECIFICATIONS ACCEPTED.

17,992, W. Brown, Drawing Instrument.—19,260, C. & J. Smith, Wood-working Machines, especially applicable to chamfering and dovetailing and other sloped or bevelled work.—19,605, G. Abernethy, Draught-Excluders for Doors, Windows, &c.—20,611, E. Lucas, Wall Decoration.—20,812, J. Sowden, Affixing Sash-lines to Window-frames, &c.—21,041, E. Allen, Erection of large Buildings suitable for Exhibitions.—21,187, A. Burlingham, Machinery for Pressing Bricks and Tiles.—21,192, E. Allen, Concrete Buildings, &c.—21,276, J. McGlashan, Valve for Preventing Down Draught in Chimneys, Ventilators, &c.—13, J. Sim, Fittings for Casement Windows, Doors, &c.—104, B. Oelrichs, Baker's Ovens.—277, A. Lees, Curing Smoky Chimneys, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

603, J. Becker, Scaffolding.—3,887, W. Thompson, Ventilators.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JANUARY 19.—By *J. Baker & Son:* "Hall's Upper Wharf," (Grosvenor-rd., Pimlico, u.t. 38 yrs., g.r. 222*l.*, r. 500*l.*, 2,065*l.*

JANUARY 20.—By *A. Chancellor:* 1, Vineyard Villas, Richmond, u.t. 23 yrs., g.r. 3*l.*, r. 35*l.*, 240*l.*—By *C. & H. White:* 140, Vauxhall Walk, Lambeth, f., 410*l.*; 38, Crozier-st., u.t. 41 yrs., g.r. 5*l.* 12s., r. 40*l.*, 500*l.*; 33, Foreign-st., Brixton, u.t. 74 yrs., g.r. 4*l.* 10s., r. 38*l.*, 300*l.*—By *Bean, Burnett, & Co.:* No. 366, Clapham-rd., u.t. 51 yrs., g.r. 12*l.*, r. 75*l.*, 725*l.*; No. 368, u.t. 51 yrs., g.r. 12*l.*, r. 80*l.*, 820*l.*

JANUARY 21.—By *A. J. Sutherland:* 75 and 77, Lillington-st., Westminster, u.t. 38 yrs., g.r. 10*l.*, r. 92*l.* p.a., 840*l.*

JANUARY 22.—By *Farebrother, Ellis, & Co.:* 67, Central-hill, Norwood, f., r. 20*l.*, 550*l.*; freehold stabling in the rear, r. 12*l.*, 170*l.*: 101, Central-hill, f., r. 40*l.*, 800*l.*—By *C. Cle T. Moore:* 34, Tredegar-rd., Bow, u.t. 72 yrs., g.r. 6*l.*, r. 32*l.*, 305*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Greenheart, B.G. ....ton	6 15 0	7 5 0
Teak, E.I. ....load	10 0 0	13 0 0
Sequoia, U.S. ....foot cube	0 2 8	0 3 0
Ash, Canada ....load	2 10 0	4 5 0
Birch ,, ...fathom	2 5 0	5 5 0
Elm ,, ...load	3 10 0	4 15 0
Fir, Dantsic, &c. ....load	2 0 0	3 15 0
Oak ,, ...load	2 10 0	4 10 0
Canada ....load	4 17 6	6 10 0
Pine, Canada red ....load	2 10 0	3 10 0
,, yellow ....load	2 0 0	5 10 0
Lath, Dantsic ....fathom	2 0 0	6 0 0
St. Petersburg ....load	5 0 0	7 0 0
Deals, Finland, 2nd & 1st. std. 100	7 10 0	10 0 0
,, ,, 4th and 3rd 100	7 0 0	7 5 0
Riga 100	6 0 0	8 0 0
St. Petersburg, 1st yellow 100	9 10 0	14 10 0
,, ,, 2nd ,, ...100	7 10 0	9 0 0
,, ,, white 100	7 0 0	10 0 0
Swedish 100	7 0 0	15 10 0
White Sea 100	8 0 0	17 0 0
Canada, Pine, 1st 100	13 0 0	24 0 0
,, ,, 2nd 100	9 0 0	16 0 0
,, ,, 3rd, &c. 100	7 0 0	10 0 0
,, Spruce, 1st 100	8 10 0	10 10 0
,, ,, 3rd and 2nd 100	6 10 0	8 0 0
New Brunswick, &c. 100	5 10 0	7 10 0
Battens, all kinds 100	4 10 0	15 10 0

TIMBER *(continued)*.	£. s. d.	£. s. d.
Flooring Boards, sq., 1 in., prepared, First 100	0 10 0	0 14 0
Second 100	0 8 0	0 10 6
Other qualities 100	0 5 6	0 7 9
Cedar, Cuba ....foot	0 0 4	0 0 5
Honduras, &c. ....foot	0 0 3½	0 0 4½
Mahogany, Cuba ....foot	0 0 4½	0 0 6½
St. Domingo, cargo average ...	0 0 4½	0 0 6½
Mexican ,, ...foot	0 0 4½	0 0 5½
Tobasco ,, ...foot	0 0 5½	0 0 6½
Honduras ,, ...foot	0 0 5½	0 0 6½
Box, Turkey ....ton	4 0 0	13 0 0
Rose, Rio ....ton	12 0 0	19 0 0
Bahia ....ton	10 0 0	18 0 0
Satin, St. Domingo....foot	0 0 9	0 1 3
Porto Rico ....ton	0 0 10	0 1 6
Walnut, Italian ....foot	0 0 4	0 0 7

METALS.		
IRON—Bar, Welsh, in London tn	6 5 0	6 15 0
,, ,, at works in Wales	5 15 0	6 5 0
,, Staffordshire, in London..	6 5 0	7 0 0
COPPER—British, cake and ingot	56 10 0	57 10 0
Best selected ....ton	59 0 0	60 0 0
Sheets, strong ....ton	66 0 0	0 0 0
Chili, bars ....ton	53 10 0	0 0 0
YELLOW METAL....cwt.	0 0 6	0 0 6½
LEAD—Pig, Spanish ....ton	12 16 3	0 0 0
English, com. brands ....ton	0 0 0	0 0 0
Sheet, English, 3 lbs. per square foot and upwards....ton	15 0 0	15 5 0
Pipe ....ton	15 10 0	0 0 0
ZINC—English sheet ....ton	25 5 0	26 10 0
Vieille Montagne ....ton	27 0 0	0 0 0
TIN—Straits ....ton	91 10 0	0 0 0
Australian ....ton	92 0 0	0 0 0
English Ingots ....ton	94 10 0	0 0 0

OILS,		
Linseed ....ton	22 0 0	22 7 6
Cocoanut, Cochin ....ton	33 10 0	34 0 0
,, Ceylon ....ton	23 0 0	23 5 0
Palm, Lagos ....ton	25 5 0	25 10 0
Rapeseed, English pale ....ton	29 5 0	0 0 0
,, brown ....ton	27 5 0	27 10 0
Cottonseed, refined ....ton	18 0 0	0 0 0
Olein ....ton	22 0 0	24 0 0
Lubricating, U.S. ....gallon	0 0 6	0 0 0
,, refined ....gallon	7 10 0	12 0 0
TAR—Stockholm ....barrel	1 1 6	1 2 0
Archangel ....barrel	0 14 6	0 0 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ABERGAVENNY.—For supplying warming apparatus to church at the Asylum. Mr. Alfred Swash, architect, Newport, Mon.:—

Davis ....and Co., Bristol & Co.	£144 0
Edwards & Co.	138 4
Hunt & Co., Abergavenny*	146 10

* Accepted.

ARDROSSAN.—For the supply and delivery of 2,000 lineal yards of 9-inch cast-iron pipes and a few bends of smaller size, for the Parochial Board of Kilbirnie. Mr. J. A. A. Leslie & Reid, engineers, 72, George-street, Edinburgh:—

D. J. Stewart & Co.	£1,724 5 1
Macfarlane, Strang, ...	£1,585 15 7
A. Leslie	1,715 8 7
Edington & Sons	1,589 17 6
Glasgow*	1,549 [illegible]

ARDROSSAN.—For supplying 4,000 lineal yards of cast-iron pipes from reservoir, and constructing filters and tank, waterworks, for the Police Commissioners. Messrs. J. A. Leslie & Reid, engineers, 72, George-street, Edinburgh:—

T. H. Carson	£2,138 0 0
J. Johnstone	1,925 5 0
G. Inglis	1,837 4 2
R. C. Brebner	£1,785 17 10
J. Urquhart, Shaw-lands, Glasgow* ..	1,682 14 7

* Accepted.

BEDFORD.—For erection of stabling and shedding, for the Town Council. Mr. John Lunn, Borough Surveyor, Corn Exchange, Bedford:—

R. J. Brick	£841 16 0
R. Brick	841 7 6
G. Tait	825 0 0
T. Loughton	786 0 0
G. Harrison	780 0 0
W. Haynes	775 0 0
G. E. Fathers	£654 0 0
H. Walker	652 18 1
W. Freeman	596 0 0
S. H. Coleman	595 8 0
J. F. White*	557 0 0

* Accepted.

[All of Bedford.]

CARDIFF.—For forming, metalling, paving, kerbing, and channelling the several streets named hereafter, for the Corporation. Mr. W. Harpur, M.Inst.C.E., Borough Engineer, Town Hall, Cardiff:—

Plasnewydd-place.

Dd. Evans	£398 14 5	T. Harries	£240 7 0
H. & F. Osmond	298 17 0		

Glenroy-street.

Dd. Evans	£373 6 1	W. Morris	£173 7 0
H. & F. Osmond	334 17 8	T. Harries	264 17 6

Arran-street.

Dd. Evans	£196 11 0	M. Lawrence	£128 7 0
H. & F. Osmond	186 15 0	T. Harries	116 8 0

Keppoch-street.

Dd. Evans	£920 9 3	T. Harries	£582 15 6
H. & F. Osmond	877 16 6	Gibbon & Geen	534 14 9

Dock's-lane.

Dd. Evans	£223 14 11	J. Allan	£238 3 0
J. Rich	223 17 9	T. Harries	221 11 6

Claude-road.

Dd. Evans	£380 8 0	T. Harries	£559 4 6
J. C. Pearson	689 5 6	Rd. Smith	553 2 0

Ruthven-street.

Dd. Evans	£1,318 15 10	Wilde & Allan	£837 2 0
T. Rees, jun.	982 14 0	T. Harries	810 14 2

Cottrell-road.

Dd. Evans	£447 18 5	Rd. Smith	£325 12 0
J. C. Pearson	349 7 6	T. Harries	302 16 0

Treharris-street.

Dd. Evans	£256 11 3	H. & F. Osmond	£191 7 5
J. C. Pearson	202 9 9	T. Harries	177 7 0
Rd. Smith	191 10 6	J. Rich	149 2 8

Plasnewydd-road.

Dd. Evans	£304 4 5	T. Harries	£261 3 2
T. Rees, jun.	308 18 0	J. Rich	245 12 7
Gibbon & Geen	272 2 0		

Upper Kincraig-street.

Dd. Evans	£464 0 3	Wilde & Allen	£294 6 0
H. & F. Osmond	351 4 7	T. Harries	286 3 10

CROYDON.—For fitting-up shop and sundry alterations at 109, North End, Croydon, for the Home and Colonial Stores, Limited. Mr. Robert Willey, architect, 66, Ludgate-hill, E.C.:—

Nightingale	£354 | M. Taylor (accepted) £333

CARDIFF.—For general repairs to the abattoirs and cattle markets at Roath and Canton, for the Corporation. Mr. W. Harpur, Borough Engineer, Town Hall, Cardiff:—

Canton Abattoir.

Hy. Davies	£126 13 0	J. Gibson, Cardiff (accepted)	£80 18 0
A. J. Howell	94 0 0		
Thos. Gough	86 0 0		

Roath Abattoir.

J. Gibson	£147 0 0	A. J. Howell	£90 0 0
Hy. Davies	98 17 6	Thos. Gough, Cardiff (accepted)	80 0 0
E. Williams	92 14 0		

DARWEN.—Accepted for building a Liberal Club at Chapels, Darwen. Mr. J. B Thornley, architect, 45, Market-street, Darwen:—

B. Lloyd & Son, *Masons and Bricklayers*	£318 0 0
Whalley & Walmsley, *Joiners*	138 0 0
Parkinson Bros., *Plasterers and Painters*	26 0 0
Duffy & Wrighton, *Plumbers*	38 0 0
H. Baron, *Slater*	22 0 0
[All of Darwen.]	
Total	£562 0 0

EGHAM.—For making good, metalling, &c., Hummer-lane Denham-road, and Crown-street, for the Windsor Rural Sanitary Authority. Mr. William Menzies, Surveyor, Surbiton House, Englefield-green, near Egham, Surrey:—

Franks	£1,365 0 0	Free	£1,247 10 0
Talbot	1,347 0 0	Osdes Bros.	1,243 0 0
Wheeler	1,315 0 0	Falgent & Beauchamp	1,227 18 0
Iles	1,251 0 0	G. & C. Allen	1,170 13 0

GUILDFORD.—For the erection of a new house, London-road, Guildford, for the Hon. J. R. D. Tollemache. Mr. A. J. Sturges, architect, 4, High-street, Guildford. Quantities supplied:—

Mitchell Bros.	£3,426	G. Strudwick	£3,190
T. E. Downes	3,290	R. Smith	2,949
T. Bennett	3,200	R. Wood	2,838
Stanley Ellis	3,189	E. H. Kingerlee	2,697
W. Smith & Sons	3,146	P. C. May, Guildford*	2,393

* Accepted.

LEEDS.—Accepted for the erection of a new club-house in Ash Grove, for the Hyde-park (Leeds) Recreation Club, Limited. Mr. Walter A. Hobson, architect and surveyor, 82, Albion-street, Leeds:—

Excavator, mason, and Mason work—William Evans, Skinner-lane, Leeds	£500 0 0
Carpenters' and Joiners' work—J. Lodgard & Son, Ventnor-street, Leeds	390 0 0
Slaters' work—James Season, Hunslet-lane, Leeds	37 10 0
Plumbers', Glaziers', and Gasfitters' work—Harry Boston, Reservoir-street, Leeds	76 0 0
Plasterers' and Casperers' work—Henry Pearson, Ravensburgh-street, Leeds	95 0 0
Painters' work—Joseph Walker	20 14 0
	£1,119 4 0

LEICESTER.—For alterations and additions to brewery, Lower Church-street, Leicester, for the Leicester Brewing and Malting Company (Limited). Messrs. Jinkinson & Mackenzie, architects, 5, Bedford-row, W.C. Quantities by Messrs. R. L. R. Curtis & Sons:—

M. Hickling	2,460	Clark & Garret	£2,284
N. Elliot	2,325	T. Hutchinson & Son	2,172
G. Duxbury & Son	2,266	[All of Leicester.]	

LIVERPOOL.—For erecting St. Bede's Vicarage, Hartington-road, Liverpool. Messrs. Wm. G. Habershon & Fawckner, architects, 28, Bloomsbury-square, W.C.:—

M. Brown & Sons	£2,511	Tomkinson & Son	£2,077
[illegible]	[illegible]	Jones & Sons	1,960
Haigh	1,936	Holme & Green	1,864

[All of Liverpool.]

LONDON.—For erecting new Weights and Measures Office at New-street, for the London County Council. Mr. Thomas Blashill, Architect:—

Hart Bros.	£4,174	P. T. [Churcher	£3,800
H. L. Nightingale	4,110	C. Horton	3,779
T. Bilham & Son	4,034	J. Garrard & Son	3,761
T. L. Green	3,985	Co-operative Builders	3,725
W. Akers & Co.	3,937	W. Backhurst	3,700
G. E. Bryan & Son	3,944	Stimpson & Co.	3,620
C. Ansell	3,907	R. G. Bentley	3,610

LONDON.—For public conveniences at Dulwich Park, for the London County Council. Mr. Thomas Blashill, Architect:—

Finch	£670	Wallis	£572
Stidder	627	Akers	540
Channing	625	Mills	480
Gearatt	585		

LONDON.—For alterations at 9, Paternoster-row, E.C. Mr. Robert Williams, architect:—

W. S. Kinsey	Time 9 weeks	Total	£1,017 0 0
Brine & Son	,, not stated	,,	792 0 0
Outhwaite & Son	,, 6 weeks	,,	649 0 0
W. Woodin	,, 8 ,, ...	,,	626 0 0

LONDON.—For making up, paving, &c., of two roads in the parish of Fulham, for the Vestry. Mr. W. Sykes, New Street-square:—

Greenham	£1,630	Nowell & Robson	£1,358
Tomes & Winpey	1,431	Bell*	1,284
Killingback	1,405		

* Accepted.

LONDON.—For making up, paving, &c., of seven roads in the parish of Fulham, for the Vestry. Mr. W. Sykes, New Street-square:—

Greenham	£4,042	Tomes & Winpey (accepted)	£3,798
Nowell & Robson	3,688	Killingback (withdrawn)	3,451

LONDON.—For excavation and foundations for new factory and warehouse at Goldsmith-lane, for Messrs. J. & R. Morley. Mr. M. J. Treadwell, architect:—

Ashby Bros. (accepted: time, 8 weeks)	£4,385 0 0

[For full list see *Builder*, January 17, p. 57.]

LONDON.—For erecting new Baptist chapel at Honor Oak, S.E. Mr. George Baines, architect, 4, Great Winchester-street, E.C.:—

Higgs & Hill	£6,399	G. Dobson	£5,960
H. L. Holloway	6,174	F. & H. F. Higgs	5,883
L. Rider & Son	6,030	R. G. Buttley	5,695
Hollidge & Greenwood	5,993	S. J. Scott, 3, Blomfield-street, E.C. (accepted) ..	5,497
S. J. Jerrard	5,977		

[Architect's estimate, £5,600.]

LONDON.—For alterations to the "Lord Palmerston" public-house, Hackney-road, N.W. Messrs. Furniss & Thorpe, architects, 60, Kentish Town-road:—

Drew & Cadman	£2,203	Amey	£1,976
Perkins	2,093	Gould & Brand*	1,895
Toms	2,037		

* Accepted.

LONDON.—For additions, alterations, and fittings at "The Beaufoy Arms," Lavender-hill, for Mr. F. J. Upright. Mr. D. Carmichael, architect:—

[illegible] & I. W. Rumens (accepted)	£450 0 0

[No competition.]

LONDON.—For building stabling and coach-house at Tranmere-road, Streatham, for Mr. Horace Parker:—

Lyon & Sons	£275	Bailey & Co.	£258 0
Page	265 0	Marriage	242 0
Horrocks	260 0	M. Taylor (accepted)	229 0

LONDON.—For additions and stabling to No. 7, Maplesbury-road, Brondesbury, N.W., for Mr. J. M. Mitchell. Messrs. Physick & Lowe, architects, 95, Park-street, Grosvenor-square:—

Gould & Brand, amended estimate (accepted)	£1,214 0 0

LONDON.—For the erection of a furniture repository in Musjid-road, Battersea, for Messrs. Arding & Hobbs. Messrs. Tolley & Son, architects:

J. Carmichael	£2 620 0 0	W. Hammond	£2,191 0 0
W. Martyage	2,473 0 0	R. Jewell*	2,189 10 0
T. Capel	2,440 0 0		

* Accepted.

LONDON.—For alterations and additions to Regent House, Kirkdale, Sydenham, for Mr. W. Cobb. Messrs. Tolley & Son, architects:—

Bulled & Co.	£497	J. Waddington	£389
Smith & Sons	493	W. Marrage (accepted)	389

LONDON.—For decorative and sanitary work at 41, Gardensquare, W.C. (exclusive of fittings), for Mr. A. J. Simmons:

Wm. Tout, Hendon (accepted)	£126 0 0

MANCHESTER.—For alterations to house at Heaton Mersey, for Mr. S. Bersl. Mr. J. D. Harker, architect:—

John Rhodes	£307	John Bland	£315
Ed. Wood	355	Burgess & Galt (accepted)	307

MORLEY (Leeds).—For the construction of a storage reservoir at the Withens, for the Morley Corporation. Mr. Chas. Gott, M.Inst.C.E., Engineer, 8, Charles-street, Bradford, Yorks.:—

Henry Vickers	£49,600 0 0	Schofield, Sons, & Co.	£35,850 15 0
S. Pearson & Son	48,300 0 0	Crabtree Brothers	44,828 7 3
John Derkin & Son	47,416 19 5	Benjamin Lamb	44 422 14 5
Parkinson & Rayer	41,288 1 6	David Barry	39,844 0 0
Eli. h Tempest	37 210 0 0	H. F. Sherby & Son, Burnley, Lancs.*	32,027 10 5
Walter Binns	37,128 18 6		

* Accepted.

NEWPORT (Mon.)—For rebuilding business premises, Commercial-road, for Mr. John Phillips. Mr. Alfred Swash, architect and surveyor, 3, Friars-chambers, Newport, Mon.:—

T. G. Diamond	£1,920 0 0	E. Richards	£1,693 0 0
W. Price	1,895 0 0	R. Williams & Son	1,690 0 0
W. Blackburn	1,871 0 0	Thos. Webb, 1, Kirby street, Newport*	1,684 0 0
J. Linton	1,850 0 0		
Moulton & Brownscombe	1,840 0 0	* Accepted.	

NEWPORT (Mon.)—For supplying shop fittings at No. 85, Commercial-road, for Mr. Jno. Jones. Mr. Alfred Swash, architect and surveyor, 3, Friars-chambers, Newport, Mon.:—

Bartlett & Son	£146 0 0	Parnall & Son	£128 0 0
Jones & Son	145 0 0	E. Richards, Newport*	125 0 0

* Accepted.

OXTED (Surrey).—For building house at Oxted, Surrey. Mr. Ellis Marsland, architect, 9, Pembridge-road, W.:—

Money Marsland, North-street, Wandsworth*	£1,150 0 0

* Accepted.

PINNER (Middlesex).—For the erection of residence, lodge, and greenhouses. Mr. A. Ash Rake, architect:—

Dawson	£2,621	Eldred	£1,850
Weston	2,4 6	Kirby & Sons	1 879
Batchelor	2,207	Atherton & Latta	1,758

READING.—For the erection of a suite of offices, leather-rooms, store-rooms, and engineering workshops at Reading, for Mr. H. Lewis. Mr. Walter H. Bell, architect, Newbury:—

W. H. Simonds	£1,680	J. A. Sims	£1,490
Claridge & Bloxham	1,649	G. & T. Raffell	1,280
F. Hawtry	1,685	T. Pilgrim	1,163
G. Wernham	1,550	T. H. Kingerlee, Oxford*	1,065

* Accepted.

REDHILL.—For the erection of twenty-four houses for Mr. Richard Trower. Mr. T. Rowland Hooper, architect, Redhill:—

Apted Bros.	£6,672 0	W. Neall	£5,999 10
Taylor	6,654 0	Buckland	5,984 0
Simmons	6,620 0	Cook	5 848 0
Carter	6,080 0	Carrick (accepted)	5,203 0

RHONDDA VALLEY.—For the erection of a hotel at Tonypandy, for the Tonypandy Brewery Company. Mr. Thomas Old, architect, Tonypandy:—

John D. Williams	£2,900 0	David Jones	£2,631 0
John Hopkins	2,637 13	John Haines, Cardiff*	2,225 0

* Accepted.

SAWBRIDGEWORTH.—For making about 900 yards of roadway on the Spring Hall Estate. Mr. A. U. Higgins, surveyor, 89 and 90, Leadenhall-street, London, E.C.:—

Walter Scrivener	£446 0 0	W. H. Wheeler, South Conborough & Lofts	£298 0 0
Conborough & Lofts	296 0 0	ward Bridge, E.C.*	
J. Bloomfield	253 0 0	J. Jackson (without drawn)	170 0 0
A. Farrell	£24 18 0		
Geo. Bell	225 0 0	* Accepted.	

SHEFFIELD.—For the extension of Plum-lane Mortuary, Sheffield. Mr. Charles F. Wike, Borough Surveyor, Sheffield:—

W. & A. Forsdike	£190 0 0	J. Morton	£148 0 0
T. Lowe & Sons	177 12 4	J. Eckeley	147 0 0
Ash, Son, & Booth	160 0 0	J. Maslin & Son, Sheffield*	145 0 0
R. Powell & Sons	158 0 0		
Longden & Son	154 0 0	* Accepted.	

TONBRIDGE.—For the erection of a north aisle to the chapel at Tonbridge School, for the Worshipful Company of Skinners. Mr. E. H. Burnell, Surveyor to the Company, 32, Bedford-row, W.C., architect. Quantities by Mr. W. R. Mallett, 35, Great St. Helens, E.C.:—

W. J. Mitchell	£895 0	C. J. Gallard	£623 0
G. Mansfield & Son	760 0	E. Punnett	587 10
Langdale & Hallett	700 0	Strange & Son, Tunbridge Wells (accepted)	586 0
J. Greenwood	682 0		

WEST HAM.—For Main Drainage Extension Works, West Ham. Contract No. 11. Mr. Lewis Angell, Borough Engineer:—

Griffiths & Co.	£6,475	Cooke & Co	£5,984
Bell	6,430	J. Jackson, Plaistow*	5,500

* Accepted.

WOLVERHAMPTON.—For the erection of a villa residence at Compton, near Wolverhampton, for Mr. A. W. Sims. Mr. Joseph Lavender, architect, Wolverhampton:—

H. Gough	£779	B. Guest	£750
C. Ford & Sons	778	H. Willcock	750
G. Cave	759	Bradney & Co. (accepted)	746

[All of Wolverhampton.]

WOLVERHAMPTON.—For structural alterations to furniture shop, High-street, for Messrs. T. Edwards & Son. Mr. Joseph Lavender, architect, Wolverhampton:—

H. Gough	£120 0 0

WORMINGFORD.—For new cast-iron girder bridge over the "Stour, for the County Councils of Essex and West Suffolk. Mr. Henry Stock, London, and Mr. F. Whitmore, Chelmsford, joint engineers:—

Geo. Bell	£1,930	H. Runnacles	£1,348
B. Cooke & Co.	1,650	F. Johnson	1,180
Alf. Thorne	1,500	Geo. Double, Ipswich*	1,050

* Accepted.

WORTLEY.—For the construction of a pipe-sewer, manholes, &c., in Station-road, Chapeltown, for the Union Rural Sanitary Authority:—

Dearden & Jackson	£210 10 6	Hy. Burrows	£173 0 0
Chas. Lodkin	190 0 0	Amos Ward	168 0 0
G. J. Helliwell	189 10 0	F. Haywood, Wortley*	147 0 0
F. & T. Bool	183 11 0	* Accepted.	

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The Builder.

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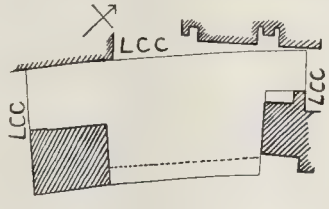
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The Municipal Lodging-House Competition.

THE scheme of the London County Council for building a common lodging-house on a portion of the ground acquired by them in the neighbourhood of Drury-lane is partly the outcome of the fact that a considerable proportion of the former tenants dispossessed in clearing the land were keepers of common lodging-houses, and this scheme is giving back to the site the same kind and extent of accommodation under better and healthier arrangement. It is also to be regarded as a financial experiment which may have important results, according to its success or failure, in encouraging or discouraging the undertaking of the same kind of enterprise by private speculation. It is estimated that if this building, including fixtures, is erected at a cost not exceeding 10,000*l.*, this will allow sufficient margin, after paying costs of management and maintenance, to provide a moderate return of interest on the total cost of land and buildings; but competitors were advised that cheapness would weigh materially with the assessors if combined with efficiency, as one object with the Council was to lead companies and others to enter into similar undertakings. What precise return the County Council expect to get from the buildings, on the basis of a 10,000*l.* expenditure, they do not state, and the word "moderate return" is rather vague.

Half the drawings submitted in the competition, including also all the four premiated sets, have been on view this week in what is called the "Grecian Room" in the County Council offices; a room which deserves a word in passing, as it is part of a house occupied once by Decimus Burton, and this room was specially designed by him for his own use and enjoyment. It is lighted by a large elliptical skylight, and the walls are adorned with a small reproduction of the Parthenon frieze. The reason that only half the drawings are exhibited is merely want of space, the other half are to be exhibited next week. The selection has been made strictly in numerical order, and the drawings were numbered in the order in which they were delivered on sending-in day; but an exception has of course been made in the case of the premiated designs, all of which were shown this week, and will we presume be shown next week.

The plot of ground on which these buildings are to be erected is an irregularly-shaped one adjoining Parker-street, a narrow street which runs parallel with Great Queen-street a little higher up, and which formerly had an evil reputation as a street dangerous to the casual visitor. It is something to see even a portion of the old buildings in this neighbourhood cleared away and fresh air and light let in, and it is to be hoped that this is only an instalment of a general clearance and rehabilitation. Even in adjoining streets which are quite respectable, and occupied by small shops, the whole atmosphere in this region between Great Queen-street and Holborn seems to reek with the accumulated smell of the dirt and decaying matter of generations. The shape of the site is shown on the accompanying plan, Parker-street running along the lower side of it: the dotted line parallel with the street shows the line of frontage which is to be observed, beyond which, however, porches or other such additions may project to a moderate extent not further defined in the instructions. Efforts have been made to acquire the two blocks of property at the angles, but unsuccessfully. Consequently the site is composed of a central space and two wings, which wings have little opportunity for side light, as even in regard to the open spaces adjoining, which are also the property of the L.C.C., competitors are warned that they must not count upon light from those quarters. This condition of the site almost inevitably points to a plan keeping the higher portions in the central area and treating the remainder for one-story buildings lighted from above; and this is the system, in one way or another, adopted by most of the competitors, though some have managed to depart from it to some extent.



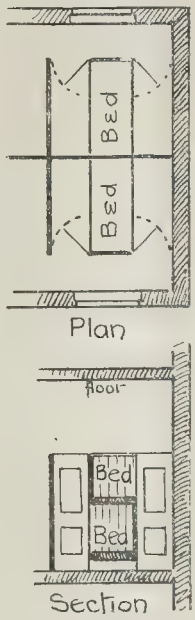
The requirements, omitting minor details, are as follows; sleeping places or dormitories for 350 men, with a minimum of 350 cubic feet of air space for each person; a sitting-room or day-room adapted also for entertainments; a dining-room with open fireplaces and a kitchen adjoining with scullery; a grocery bar or shop; a series of lavatories and baths, with twelve troughs for feet washing; a yard at the rear for ventilation and occasional exercise, not less than 450 superficial feet; an office, to have good command of the rooms used by day, especially of entrance, staircase, day-room, and dining-room. These are the items in the requirements which most directly affect the system of plan adopted.

A premium of 100*l.* was to be awarded to the successful competitor, and 100*l.* to be divided among other competitors "if the circumstances warrant it." The actual awards we published last week: they are certainly "warranted." In regard to the selected plans we believe there is little doubt that they will be carried out, and shortly. The Council are very well satisfied with them, and desirous to put the experiment into practice without delay.

The first premiated plan, No. 3, by Messrs. Gibson and Russell, places the day-room and dining-room at right angles to Parker-street, running across the wide portion of the site from the front towards the back, the kitchen occupying part of the space behind the dining-room. Between them is a space not quite so wide as either of the big rooms, appropriated to entrance and entrance-hall, office (which is placed almost in the central spot of the building), and the open yard before referred to as one of the requirements. At the back of the building a long low range of rooms parallel to Parker-street furnishes the space for lavatories, washhouses &c. These run into the bay of the site on the right, but that on the left is kept clear for future extension. The placing of the open yard on the centre line and forming the communication between the front portion of the building and the lavatories is a very good point; it affords side-light to the back portion of the dining-room

and day-room, and it cuts off the lavatory department from these by the interposition of an open-air lobby, as we may call it. The whole of the centre space between day-room and dining-room is entirely open above, except that at the end next the entrance from the street the staircase is carried up. The dormitories consist of two high blocks of building running from front to back, rising over the day-room and dining-room, and reached by the stairs near the entrance point. The arrangement of these dormitories is the best point in the plan, and the one which probably more than any other contributed to gain the authors the first premium. Each block, from the point above the first-floor level, forms one large hall with railed galleries round it on the levels of what would be the floors if it were completely floored, and an entirely open space up the centre. These galleries are surrounded with small cubicle partitions with an aisle for passage between them and the railings; the partitions of course do not go up to the ceiling; each cubicle has a door and a little floor space opposite the door, and a window corresponding with the size of the door, the partition between the cubicles running into the centre mullion of the window: the bed is on one side. For sanitary conditions this seems the best arrangement possible. As the two dormitory blocks are entirely uncumbered with buildings at the side, except the small stair block at one end, there is complete through ventilation with opposite windows, on each gallery level; the large central space leaves abundant room for aeration, and the whole can be ventilated as one hall. The glass house for the warder, placed on the bottom level of the dormitory, is the only thing open to question, as the warder could not from that position see much that was going on in the upper galleries. If inspection by the warder is really considered necessary, he should have a lift by which he could easily mount from gallery to gallery. But in the main the arrangement of this portion is admirable, and we have seen nothing else so good among the plans exhibited this week. The elevation is very plain; a certain effect is given by treating the ground storey as a lofty basement, with the large semi-circular windows of the day-room and dining-room forming prominent features in it: a little more might have been done with the upper portion, however, as far as appearance is concerned, without running into any extravagance in money.

The various systems of arranging the beds in the dormitories form an important distinguishing feature in the plans, and may be grouped into four classes: 1st: beds simply placed on the floor without any partitions. 2nd: beds with partitions at the heads, or at the sides also. 3rd: a separate cubicle for each bed, with a door. 4th: what may be called the Glasgow method, which is represented in the accompanying plan and section. Each bed on plan has two doors to it; but, as the section shows, one door gives access to a bed on the floor or nearly so (a space of 6 in. is left under for sweeping), the other door gives access to a bed which is half-way up the height of the cubicle; a half partition shuts out each bed from the other side, and the inmates lie over each other as in the berths of a ship. This method has been adopted in Glasgow common lodging-houses, and appears to be a favourite there; it has the merit of being very economical of floor space, and therefore has advantages in this sense in cases where area is limited but where height is practically unlimited: and there its advantages, to our thinking, begin and end. In a part of the kingdom where the lower orders have been accustomed to the "but and ben" style of house, in which the sleeping accommodation is arranged in recesses in the living room, or where, as a story goes, tenants who were given a three-roomed cottage shut up two rooms and slept in the cupboards of the third one, this arrangement may recommend itself as convenient and practical. In England we think most sanitarians will agree with us that as a method of housing for the night a large number of persons presumably unclean in person, with the condition of keeping the places so occupied clean, healthy, and well ventilated, it is one of the very worst and most pernicious that could be employed; it fills a place with dark corners,



The Glasgow System of Cubicle.

and makes a series of pockets for the lodgment of vitiated air. It would be possible to make the half-partitions to unlock and hinge up so as to get a current through in the daytime when the dormitory is not in use; we do not know whether this is done; but even then the insanitary result is the same at night. You cannot do a worse thing for a sleeper than put him to sleep in a close cavity or cupboard; it is a most unhealthy arrangement for any one, rich or poor; and though the class who use common lodging-houses have no right to expect luxury, they ought to have sanitary conditions; it is a mockery, while we are trying to teach the poor to be sanitary, to expose them to insanitary conditions in the officially-installed lodging-house. Yet this most objectionable arrangement seems to have fascinated a number of the competitors, who have probably been tempted to use it in the hope of thereby "beating the record" in regard to price per cubic foot.

In No. 51, by Messrs. Hopton & Williams, to which a premium of 40*l.* has been awarded, the dormitories are arranged in a long block parallel with Parker-street, the front portion of the building being carried up and the whole of the back portion left one-storied and lighted from the top. The authors employ two double rows of cubicles with aisles in the centre and against the walls, running lengthways of the building, the cubicles are on the Glasgow system which we have just characterised. The entrance is oddly arranged on the right, leading into a right-angled corridor running round two sides of the day-room; a very bad arrangement, as the corridor would be a regular lurking and larking place, and could not be under efficient supervision. The author indicates an alternative entrance in the centre, pushing the day-room to the right. The advantage of the proposed plan of corridor is a very compact arrangement of the rooms in the central portion of the ground floor, the day room and dining room being got nearly corner to corner, with the office dove-tailing into them and commanding each of them and the staircase. The lavatories and kitchen are in the space to the left, but apparently the lavatories are only accessible through the dining room; a very bad arrangement, if that is what is meant, and we cannot see otherwise. On the whole we cannot quite understand the position accorded to this set of plans.

No. 19, by Messrs. Chorley & Cannon, obtains a premium of £30. There is a great deal of merit in this plan; the drawback to it is that it is expensive. The ground plan is very simply arranged; the day-room and dining-room are placed symmetrically on each side of a central entrance; the office is close to the entrance, and commands day-room and dining-room well, but not the stairs, which are round the corner. The lavatory department is arranged along the back of the building, which is not however carried to the back of the site, where a strip of ground is left open for yards. The dormitories are arranged in a long longitudinal block running over the lavatory block at the back, and with three arms running from it transversely to the front at Parker-street, with open spaces of equal width between them, above the ground-floor buildings. This long range of dormitories contains a row of single cubicles along each wall, with a gangway in the centre, and all the blocks have window ventilation at both sides. The objection to the plan, which is simple and sanitary, is that the plan of the dormitories, collectively taken, renders inspection difficult, and that there is a good deal too much heavy wall-building for economical conditions. The architects' real point is when we come to the Parker-street front, for there the ends of the three side blocks of dormitories form three gables, rather picturesquely treated, fronting the street, with open spaces between them for sun and air to get down. This is far better, as abutting on a narrow street, than a continuous line of high wall; and we can only regret that a design which shows such a good point as this should be ineligible in some other ways.

No. 70, by Mr. T. Locke Worthington, which receives a premium of 30*l.*, fills up the site very much on the ground floor, which however is well arranged. There is a central entrance leading into a large square hall, the office being placed in the middle of it, and having full command of the day-room and dining-room doors, which are on the right, and of the stairs, which are on each side of the entrance. The dormitories form a longitudinal block running along the Parker-street front, as in No. 51, also with "Glasgow" cubicles, a double row back to back down the middle, and a single row down the walls with a gangway between. Behind the single row of cubicles, which do not come quite up to the wall, is a narrow causeway for inspection, getting at pipes, opening windows, &c. The back portion of the site is entirely occupied by one-story buildings lighted from the top. A corridor leads from the left of the entrance-hall to the left-hand portion of the site, which portion is utilised as the open yard. On the whole this plan appears to us more meritorious than either 51 or 19.

The majority of the drawings shown already are a good set, and seem to have had no little care and thought bestowed on them. Though we have not noticed any which came at all near to No. 3 in the practical treatment of the problem, a few which exhibit some special features may be mentioned. In No. 8 the ground story is placed partially underground, or made a basement half above ground, no doubt with the intention of economy in cubic contents. This is a method which is worth consideration where it is necessary to keep down the cost of a building in every reasonable manner in order to obtain an adequate return for the outlay, but it is not to be recommended if it can be avoided. The designer places the dormitories in two long parallel blocks the whole length of the site; the objection to this is that the southern block is in the other's light, and there is a long deep trench between in which air would tend to

become stagnant on still days. In No. 9, by Messrs. J. W. C. Atkinson and W. H. Sugden,* the dining-room and day-room are kept at the back and top-lighted, and the dormitories above them are placed transversely between the skylights, branching out on each side of a long central corridor, with a small room out of the passage for a warder, who can thus patrol and keep an eye on all the wards; a plan which has merits in the way of division and supervision combined; but it is somewhat costly. The elevation aims a little more at effect than some of the others. Messrs. Newman & Newman (No. 13) place the dining-room and day-room on opposite sides of the front, and make the centre alley between a cartway or covered street, with steps up to the doors opening from it. We do not see the motive for this exactly; the cart passage is for the bringing in and out of stores, clothing, &c., we presume; but it would be very inconvenient to go down steps from the day-room and up steps again to dining-room and *vice versâ*, and the cart-passage or street would be a regular lounging-place. Messrs. Malcolm Stark & Rowntree (No. 21) place their cart-passage on the left of the whole front block, so as not to interfere with it; their plan is a good and simply-arranged one, placing dining and day-rooms in parallel blocks at right-angles to Parker-street, with the entrance-hall, staircase, and office in a small connecting block between them. The dormitories are formed in the same blocks carried up. The plans of No. 35, by Messrs. J. W. Dunford and R. L. Pearce, have been prepared with great care, and have several good points; the day and dining-rooms are arranged on each side of a central corridor which leads through to the staircase, and thence to the lavatory department which forms a long block at the back, while a passage outside of it leads to the exercising-yard in the left bay of the site. The office is well placed in a corner of the day-room, commanding the whole of it, the stairs and passage, and the door of the dining-room. The dormitories form one large longitudinal block above, parallel with Parker-street. Both these and the last-named competitors employ the Glasgow method of arranging the cubicles.

There are no detail drawings of warming and ventilating arrangements, and as the descriptions are not affixed to the frames with the drawings, it is not easy to form any definite judgment as to the efficacy of the means proposed. Air admitted beneath the windows, and after contact (we presume) with heating-tubes when necessary, appears to be the favourite method, as far as can be judged by indications on the sections, which require description to further elucidate them.

As far as the exhibition of this half of the drawings takes us, it appears that the right selection has been made, and the building, if carried out, will be an interesting and probably very useful practical experiment in regard to the economical and remunerative construction, in London, of lodgings for the poorest class.

*Names are given in some cases; where the authors have esired it, we presume.

NOTES.

IT is very satisfactory to know that the Scottish railway strike has come to an end, though but little satisfaction will be felt by some of the unfortunate strikers. Only a day or two before the collapse of the movement it was asserted by their leaders that "we win, hands down." But whatever may have been won, it has been at considerable cost,—and, it might be added, with heads down,—a number of the self-discharged employés failing to get re-instated, simply because there are now no vacancies for them. Many of them freely admit that, individually, they had no grievance whatever, and only came out to assist their comrades. It is not improbable, however, that the strike will result in a larger number of hands being engaged than formerly, in order to effect a reduction in the hours of labour where really necessary; so that the number of men permanently thrown out of employment will be comparatively small. The total loss of traffic during the six weeks' struggle has been put down at 127,634*l.*, while the strain on the funds of the Union must necessarily have been very severe, in spite of the assistance received from outside. Those of the strikers who have not been reinstated will still have to be supported by the Union for some time. It is the general opinion that the North British Company's *employés* had strong grounds for complaint, and the management have promised to consider and remedy their grievances. This Company have certainly not received a very great amount of sympathy with regard to the heavy loss sustained through the strike, though this may be partly referable to the irritation caused by their Waverley muddle, combined with the public feeling on the subject of overtime which culminated in the demand for Parliamentary interference commented upon in these columns last week. The North British shareholders had the consolation of being thanked for their support by the chairman at a special meeting last Tuesday, when Lord Tweeddale stated that the directors could have taken no other action than they did, because to have given in would have rendered railway management simply impossible.

WE have received from the National Association of Master Builders of Great Britain (W. Knox, secretary, 6, Lord-street, Liverpool) two printed documents of a statistical character relating to the building trade. The first is a "Comparative Statement" showing the hours worked per week, and the rate of wages per hour, in the various branches of the building trade in the principal towns of England, Scotland, and Wales. This cannot but prove useful for reference by architects and builders who may have to carry out works in distant towns. There are some considerable variations in the hours worked and the wages paid in different towns, the men in the smaller towns, as a rule, working for longer hours and receiving less per hour than the workmen in the larger centres of industry. The second document referred to is a "Tabular Statement of the State of Trade and the Labour Market, January 1, 1891." Several towns are marked as having made "no return," but in a very large number the return as to the state of trade is "depressed," "dull," "very dull," "quiet," "very quiet," "bad," "very bad," "slack," "very slack," and so on. Coupled with these sombre returns as to the state of trade, the reports as to the supply of labour are, in nearly every case, "abundant," "plentiful," "in excess of demand," "far beyond demand," "exceeding demand," &c. These reports, which are not altogether encouraging from the masters' point of view, will, it may be hoped, be borne duly in mind by advocates of strikes. Let us say, however, that we are not quite sure that returns indicative of the state of the trade and the labour market on January 1 afford conclusive evidence as to the average condition of the trade and the labour market taken all the year round. At any rate, we hope that things will be better two or three months hence than,—according to these returns,—they were on January 1.

THE modern tendency to look to the State for protection and assistance was well exemplified last week in the House of Commons. It was suggested that there should be a Minister of Mines. The real idea underlying this proposition was that the State should do more to safeguard the interests of miners. Again, another proposition was that a body should be added to the Board of Trade to inquire into disputes between masters and men, to obtain information, and act as arbitrators. Here, again, we have the same idea. The State is to settle the disputes between capital and labour. Such ideas, even if put into practice, must prove disappointing. Every increase in State departments increases State expenditure, and enlarges the already large body of officials. The more officials there are, the more "red-tapeism" must exist, and the less elasticity there is in the general management of affairs. As to the first of these propositions, the Home Secretary already is quite sufficiently a Minister of Mines, and as to the second, there are already plenty of people quite able and willing to arbitrate in trade disputes.

THE most important point in the newly-issued Report of the Board of the Manchester Ship Canal Company is that application will have to be made to Parliament for power to raise further capital. The directors do not state what further amount of capital is required. The announcement is, however, remarkable, since it shows that the original estimates for the work have been exceeded. If those estimates are not to be relied on, it throws doubt on the ultimate success of the enterprise. Time alone can show whether the opponents or the supporters of the scheme are in the right. But the mere fact that further Parliamentary sanction has to be obtained for the raising of more capital must be considered as disappointing.

OUR Belgian contemporary, *L'Émulation*, devotes a good deal of its attention, in the first number of its new series, to English architecture, partly in the shape of a sympathetic review of M. Paul Sédille's recent work on that subject, partly in a leading article by M. Paul Saintenoy on notes of a tour in England, with illustrative sketches. M. Saintenoy is highly flattering in his manner of speaking of our architecture, which he considers has "qualités de premier ordre et surtout le fait qu'il est d'une originale personalité au milieu du nivellement artistique qui se produit de nos jours entre les nations." He is surprised evidently that our architecture is so little known to Continental architects, and recommends them to become better acquainted with it as something worth their knowing more of than they do at present. Of the want of acquaintance with English architecture among Frenchmen we have spoken several times lately in reference to M. Planat's immense architectural encyclopædia now in progress. Perhaps other French architects might be as much surprised as M. Saintenoy if they took the trouble to come and examine for themselves, as he appears to have done.

A CORRESPONDENT calls our attention to the following advertisement which has been appearing in a well-known daily paper:—

"SURVEYORS, ENGINEERS, AND ARCHITECTS introducing work to a Road, Sewer, and General Contractor will be liberally dealt with. Communications strictly private and confidential. Advertiser well versed in the latest and most improved methods of construction."

We suppress the address at the end. The advertiser is openly inviting "surveyors, engineers, and architects" to do what, in the case of persons holding official positions, would be an act of fraud, and in the case of non-official men is in the highest degree unprofessional, and a breach of duty to their clients. Our correspondent asks if the Institution of Civil Engineers, the Surveyors' Institution, or the Institute of Architects cannot insert an advertisement under this, offering a reward for information as to any member of their respective bodies accepting the commission thus offered. We fear that is not a very practical suggestion. The only thing "surveyors engineers and architects" can do in regard to such advertisements is to let them severely alone: the practice will be dropped when it is found that nothing is to be got by it.

WHILE on the subject of advertisements we may notice another of a very different stamp, harmless enough, but we fear likely to be even more barren of result. This is one which has appeared both in the *Athenæum*

and in our own columns, in which "an experienced Academical architect" who has invented a new style of architecture seeks to associate himself with an Art-Patron to introduce and develop the said style. We presume the "art-patron" is to be a man of capital who is to erect buildings in the new style; it is not very easy to see how else it is to be "introduced." If the advertiser has really developed anything that can be called a style, and which is entirely original, it will be the first time in the history of the world that this has ever been done by one man; and if he catches a millionaire willing to spend a fortune on working a new style of architecture, the event would be, if possible, more unprecedented still.

THE Bishop of London is about to issue a commission under the Union of Benefices Act, for ratifying a union between the now united benefices of St. Mildred Bread-street and St. Margaret Moses; and the now united benefices of St. James, Garlick-hythe, Holy Trinity the Less, Garlick-hill, and St. Michael, Queen-hythe. We are informed that under the scheme it is contemplated to demolish the church of St. Mildred, which was similarly threatened about ten years ago, and to constitute St. James as the mother church for the five parishes. Both these churches are the work of Wren. The latter is marked by a large bracket-clock, surmounted with a carved figure holding a staff, possibly intended for St. James the Great; and a tower, with steeple, rising to about 125 feet, both of which in section and elevation closely resemble those, also by Wren, of the neighbouring St. Michael, Paternoster Royal, and St. Stephen, Walbrook. In the *Times* of December 27, 1889, will be found a letter written by Mr. Francis Chambers, architect, to say that some forty years since he had superintended the sealing up, with a three-foot crust of concrete, of the soil beneath this church. Mr. Chambers describes the remarkable state of preservation in which the bodies were found, and thinks it is due to the sandy soil, almost black in colour, which had pulverised the coffins. He adds that some human remains underneath St. Mary-le-Bow, Cheapside, were found, about the same time, to be in a similar condition. St. James's was repaired in 1838, and completely restored in 1877, when it was fitted with the oaken pulpit and choir-stalls (attributed to Grinling Gibbons) from St. Michael, Queen-hythe. The organ, by Father Smith (1697), was rebuilt, in 1866, by Messrs. Gray & Davison. Bishop Hooper, burnt at Gloucester, and John Rogers, the Martyr, were rectors here.* The fabric cost 5,357*l.* 12*s.* 10*d.* This is the church, formerly dedicated to Sts. James and John, wherein Steele heard "the service read [by the rector, Mr. Philip Stubbs] so distinctly, so emphatically, and so fervently, that it was next to an impossibility to be inattentive" ("The Spectator," Aug. 18, 1711). The vane, in form of a ship, and large enough to hold a bushel of corn, which capped the small, but beautiful, spire of St. Michael, Queen-hythe, has been fixed above a spirelet at the new rectory-house (for St. James's) in Upper Thames-street, erected on its site, at back whereof, facing Huggin-lane, remains the churchyard. It alludes to the local traffic in grain at Queen-hythe. A stone in the Guildhall Museum records the burning of the church in 1666, and its rebuilding ten years later, for the then united parishes of St. Michael and Holy Trinity the Less.

ST. MILDRED, Bread-street, of which only the west end, of stone, can now be seen from the street, is dedicated to Mildred, who was buried, *circa* 750, in the abbey founded by Domneva at Minster, in Thanet, and which afterwards was called by her name.† Lord Trenchaunt, of St. Albans, rebuilt it *circa* 1300. It was again rebuilt, and mainly of brick, in 1677-83, at a cost of 3,705*l.* 13*s.* 6*d.* The tower, against the south-eastern corner, which is 18 ft. square at base, bears one of Wren's characteristic wooden spires covered with lead. On the cornice and blocking-course stands a leaden roof, of pyramidical shape, upon this a square lantern, and above that a slender spire, also square on plan, carrying a vane—the whole rising to 140 ft. The interior is greatly admired. Four arches support a highly-enriched hemispherical cupola or dome, constructed within the external roof by slight deal ribs attached to the principal timbers.

"The roof itself is of an ordinary 'tie-beam and king-post' construction, but in that part which occurs immediately over the cupola, the tie-beam, instead of being attached to the foot of each principal rafter, as usual, is raised about half way up, in order to admit the rise of the cupola; and diagonal braces from rafter to rafter are introduced. The architectural student may derive advantage from an examination of it."*

Here, too, is some fine carving on pulpit and sounding-board, the supposed work of either Gibbons or his pupils. The church measures 62 ft. by 36 ft., the height is 40 ft. A tablet commemorates some members of the Crisp family, parishioners, of whom Sir Nicholas Crisp, the friend of Charles I., is said to have introduced into this country a new system of brick-making. After the destruction by the Great Fire of the Church of St. Margaret Moses, or, rather, Moyses, in Friday-street, its parish was united to St. Mildred.

WE have received the first number of *Physique*, a journal of Physical Education to be published monthly, the object of which will be to provide a high-class journal which will deal with physical education in all its aspects, from nursery and Kindergarten games to field sports, with questions of personal hygiene, &c. The subjects belonging especially to what is called Sanitation, such as drainage, water supply, &c., are not to be included, as it is considered they are already sufficiently dealt with by other journals. From the first article on "National Physique," by Mr. C. Roberts, F.R.C.S., we take the following quotation, in reference to the action of the London County Council and other bodies with regard to overcrowding:—

"It is well to temper zeal with discretion, and a looker-on who is in entire sympathy with all these agencies but not identified with their work may detect flaws in it which escape the notice of the workers themselves. In its haste to secure open spaces the County Council, for instance, shows a lack of proportion and an ignorance of the requirements of the whole county of London, with its area of 77,400 acres, its 4,282,921 inhabitants, and its 486,056 inhabited houses. A few weeks ago the Council agreed to give 200*l.* an acre for a pine-wood situated on the extreme south-east boundary of the county at Plumstead, in a district which possesses only one house and six persons to the acre, and which is contiguous to a common already in possession of the Council, and with the whole county of Kent behind it; and now it proposes to spend 20,000*l.* an acre on an overcrowded area in Bethnal Green which possesses forty-nine houses and 373 persons to the acre—not to provide an open space where one is most wanted, but to raise piles of so-called model dwellings which will eventually be occupied by a larger number of persons than exist on the ground at present. Thus we find the Council purchasing land at a considerable cost for an open space which is not wanted and which might well be used to relieve overcrowding in other parts of the county, and clearing away small houses in an already too-crowded district to supply their places by still larger houses. Overcrowding cannot be remedied by any jugglery with bricks and mortar. To put one house on the top of another is to increase all evils of over-crowding, and nothing short of a serious centrifugal dispersion of the people will be of real use in overcoming them."

THE Natural Science Museum of the University of Cambridge has had a narrow escape from destruction by fire. But for the fortunate circumstance that the outbreak occurred in the daytime, and so gave the officials on the spot a chance to extinguish the flames before they had reached any of the dangerously-inflammable spirit preparations, nothing could have saved the building, or group of buildings, with their valuable contents. The fire was put out so promptly that its exact cause is clear, and is one interesting to notice. A gallery had lately been added to one of the rooms, carried by wooden cantilevers; the inner end of one got alight, and, blazing out, set the gallery on fire. The mischief was caused by the flue from a heating-furnace, too near which (as it proved) the cantilever had been inserted, although the position of the flue was known, and sufficient precaution, it was thought, had been used by inserting the beam 6 in. to one side of it. In doing so, however, a brick or two had been knocked out of the side of the flue, thus opening a passage through which the timber became ignited, although the heating-furnace, it is worth while noting, was 40 ft. below. This incident should serve to enforce the necessity of keeping at least 9 in. of sound brickwork round every flue liable to become much heated, until it has passed clear above the roof.

AS our readers are aware, the Architectural Association has attempted, in remodelling its by-laws, to please all parties and obtain the necessary funds for its more extended action, by raising the annual subscription to a guinea for new members, and leaving old members undisturbed in their present half-guinea subscription. This most illogical and unfair arrangement, which puts the burden of increased expenditure on young incoming members, and takes it off the shoulders of the older members who have mostly made their way in the world and have more guineas to spare, seems to have been carried purely on account of the scare that has been raised that there would be an extensive resignation of old members if the subscription were raised. We have said all along that we did not believe this, and that the few members who would resign to save half a guinea a year were probably not worth retaining. The result seems likely to entirely justify our remarks. The "A. A. Notes" of January contained a generously expressed letter from Mr. W. Millard, which escaped our notice at the time, protesting against the invidious position in which the existing members were thus placed, and proposing that all who thought with him should voluntarily subscribe a guinea in future. This has drawn an equally hearty support in a letter from Mr. E. J. May in the February number of the "Notes," expressing a hope that a long list of old members will follow the course suggested by Mr. Millard. We hope so too. The Editor of this journal, who is an old member, intends to do so, and if a large number of other old members join in carrying out Mr. Millard's suggestion it will be the best possible answer to the scare that was got up about a large secession of members taking place if the subscription were raised: a scare which we always believed to be almost entirely groundless.

HOUSING OF THE WORKING CLASSES.—At the meeting of the Paddington Vestry on the 3rd inst., a memorial was presented from thirty-seven of the representatives recently appointed by the Metropolitan Vestries and District Boards to the recent conference convened by the London County Council for the purpose of considering the Housing of the Working Classes Act. The memorial, after expressing regret at the premature closing of the conference referred to, expressed the opinion that it was desirable the conference should be called together again, and asked the Paddington Vestry to take the initiative to this end. The Vestry passed the following resolution:—"That the request contained in the memorial be complied with; that the representatives appointed by this Vestry to attend the late conference be re-appointed; that the Clerk do issue invitations to the several Metropolitan Vestries and District Boards, also to the London County Council, the Common Council of the City, and the Commission of Sewers, asking them to appoint representatives, and to depute the Medical Officers of Health and the Vestry and Board Clerks to attend a meeting of the conference at the Paddington Vestry-hall, on Friday, February 20, at three o'clock in the afternoon." Invitations have been issued accordingly.

* See Mackeson's "Guide."

† St. Mildred, Poultry, the reputed burial-place of Thomas Tusser, was pulled down in 1872. Mr. L. Ffytche, of Thorpe Hall, near Louth, bought the stones for the building of a chapel there.

* George Godwin's "Churches of London," vol. ii. (1839).

LETTER FROM PARIS.

The Siberian weather we have been experiencing lately has led, among other results, to a great outbreak of charitable relief in France, both in rural neighbourhoods and cities. At Paris the organisation of relief has been very large and very intelligently carried out, and existing buildings such as gymnasia, meeting-rooms, unoccupied houses, &c., as well as the Champ de Mars buildings, have been utilised as refuges from the cold, the Palais des Arts Libéraux especially having been warmed and made into a vast dormitory. To those who knew this building during the height of the Exhibition time, the contrast of seeing it in its recent aspect, the floors spread with mattresses occupied by figures in every stage of poverty and wretchedness, was pathetic enough.

Unfortunately another effect of the cold weather has been to close the building yards. Among the works thus interrupted is the "Funiculaire" or rope-railway at Belleville, which ought to have been opened at the end of autumn, but will not be ready for two or three months now. Whether it is with the object of finding work for building artisans or from other and more æsthetic motives, several Deputies have raised a proposition for building a great legislative palace on the former site of the Tuileries, in which the Sénat and the Chambre des Députés are each to have a great hall with a "salle des pas perdus" common to both between them. The objections to the project, æsthetic, financial, and political, seem however too strong to be easily overcome. No doubt the Palace of Deputies is badly planned and arranged, and the public have cause to complain of it as well as the deputies, but its present defects might be easily remedied, and M. Joly, Architect to the Chamber, has prepared a plan which will render the building at any rate more convenient for the moment, without any extravagant outlay. Public opinion is in general adverse to the proposed Tuileries plan, not considering the requirements of Parliament a sufficient reason for such a large and costly operation which would crowd and spoil a fine open space. Another fancy of the moment is to suppress the obelisk of the Place de la Concorde and substitute a monument to Victor Hugo, an idea which meets with still less sympathy, and which would destroy the association with a site and a monument that have become almost a national property.

Unfortunately Parliament is little careful about preserving the treasures of Paris, and the small budget set apart for that object is badly laid out. A great part of the Louvre Museum, for instance, is not warmed, and consequently is useless to artists in winter; and the works for the restoration of part of the exterior have been stopped merely for want of any available funds; the Salle des États is in a lamentable state; the arrangement of the Museum of Algerian and Tunisian Antiquities has been suspended; and the objects for the present left in their cases. The Ministerial department concerned with these things is full of good intentions, but has no funds and nowhere to turn for them. In the meantime buildings are decaying, and irreparable mischief being done which might be prevented if taken in time. The ruins of the Cours de Compte still stand as they have stood for twenty years. It seems to be forgotten that there is what might be called a passive vandalism as well as an active vandalism, and that the one may have as bad effects as the other.

The small exhibition of the Cercle of the Rue Volney is very good this year. Among the works in it are two fine portraits of M. Cernuschi and M. Bœswilwald, by M. Bonnat; that of M. Constans, Minister of the Interior, by M. F. Flameng, a fine head of an old man by M. Henner, a Brétonne girl by M. Brispot, a Diana by M. Elie Delaunay, and the "Annunciation" by M. Olivier Merson, with a landscape bathed in a mystic light. The rival club, that of the "Union Artistique," has also just opened its gallery. Mention of that and the water-colour exhibition is deferred for another occasion.

While these minor exhibitions are going on, the committees of the two *Salons* are organising their respective exhibitions. At the Champ de Mars this year there will be a fourth large gallery of paintings instead of the small rooms which were pressed into the service last year, and the central hall will be arranged for the reception of sculpture, of which there will be more this year than last. It is expected that there will be some kind of effort to render the Palais d'Industrie more attractive this year; among other schemes it is suggested that there should be a "salle d'honneur" in which all the principal pictures should be collected: there is also talk of arranging "salons de repos" with lounges, &c., and hung with fine tapestries. In fact, the Société des Artistes Français seems disposed to make every effort to surpass all its former attractions. The number of works exhibited is to be limited to 1,800, a change which the public on the whole will probably appreciate. In regard to the honours, it is decided that the médaille d'honneur will be awarded by the votes of an absolute majority of the artists who have received the other honours. The number of medals to be awarded is restricted to forty.

The Louvre has received an important legacy from M. Paul Rattier, including a fine picture of the early Flemish school, somewhat in the manner of Quentin Matsys, as well as a Renaissance bas-relief and a medallion of the same date attributed to Benvenuto Cellini. The President of the Republic has also presented to the Museum his bust by M. Chapu.

It may be remembered that in consequence of the disorderly proceedings of the students M. Bonnat's atelier was closed for five months. The Minister of Public Instruction has reduced the term to three weeks, and the atelier has now opened its doors again, under new regulations which it is hoped will prevent any recurrence of these discreditable scenes.

M. Charles Garnier, it is reported, has been appointed consulting architect of the Church of the Sacré Cœur at Montmartre. If this is officially confirmed, M. Rauline will nevertheless retain the immediate and practical direction of the works. The sum which has now been spent on this church amounts to 24 million francs, of which 4 millions have been given by some generous donors, and the remaining 20 millions have been raised by subscription. 1,500,000 francs have thus been raised annually for this building.

The death of Meissonier is of course the most absorbing event in the artistic world this month. He died on Saturday, January 31, at 8 o'clock in the morning, death being the result of pneumonia. He was 80 years of age, and had been working up to the very moment of the commencement of his illness. Last year he exhibited at the Champ de Mars Salon his picture of "Octobre, 1806," which was the great success of that exhibition founded by himself, and he has left many half-finished pictures on his easel.

This remarkable artist, whose personality was as marked and original as his paintings, made himself, unfortunately, many enemies. His nature was naturally irritable, and he seldom had an amiable word for any one. But if one could feel little enthusiasm for his character, one must recognise in him, as a painter, a master comparable to Ingres and Delacroix. He possessed the highest qualities of an artist: power of drawing, of colour, of touch, and admirable perfection of finish. He was no specialist in his art nor was he confined to any particular line of subject; he illustrated the eighteenth century, the Revolution, the Empire, and the present time. He treated interior and open-air scenes with equal power; no one knew better how to group his personages, to give spirit and vigour to military, no one has better revived for us the Napoleonic epic, which he has represented at its three great epochs, 1805, 1807, and 1814. This latter picture especially, showing the Emperor on horseback, pale and as if crushed under the weight of adversity, leaves an impression of grandeur and melancholy which one cannot forget. This picture was recently bought by M. Chauchard for 850,000 francs.

Jean Louis Ernest Meissonier was born at Lyons on February 21 1811. His early days were marked by poverty and a painful struggle for the means of existence. He eventually entered the atelier of Léon Cogniet, but did not remain there more than four months, and after a short tour in Switzerland and a visit to Rome, he exhibited, in 1834, "La Visite chez le Bourgmestre," which subsequently formed part of the late Sir Richard Wallace's collection.

Among his best known and most successful works may be named "L'Amateur d'Estampes," "Le Fumeur," "L'Incroyable" (which made such a success in the Salon of 1858 and was purchased by the Baron de Rothschild), "Le Graveur," "La Lecture chez Diderot," "General Desaix à l'Armée du Rhin," "Confidence," "L'Attente," "L'Amateur des Tableaux," "Un Peintre des Enseignes," "Moreau avant Hohenlinden," "Les Joueurs de Boules," "Le Guide à l'Armée du Rhin," "Jéna," "Le Voyageur," &c. Nor must we forget one of the most able and popular of all, "La Rixe," which was purchased by Napoleon III. and presented to the Prince Consort of England. The "Bataille de Solferino," now in the Luxembourg, is another masterpiece, which was injured eighteen years ago by some person unknown, who crushed in the head of the Emperor with the point of a walking-stick; the head was subsequently repainted by the artist.

Meissonier had during his life enjoyed all the honours to which an artist could aspire. He had three times received the Médaille d'Honneur at the Salon, and on each occasion received a new dignity in the Legion of Honour, receiving the Grand Cross in 1889. He had succeeded Abel de Pujol at the Académie des Beaux-Arts in 1861. Delacroix said of him that he was incontestably the master painter of this epoch, à judgment which his contemporaries have ratified; and his death creates a void in French art which it is impossible to fill up.

The day before Meissonier's death took place the funeral of Charles Chaplin, the painter, who was born in 1825 at Andelys, but of English parents. Later in life he was nationalised as a French subject. He was a pupil of Drolling, and his true path of success was found with the three portraits which gained him the second medal of the Salon in 1851, when he abandoned his first manner and became a kind of modern imitator of Boucher and Fragonard. His early pictures were the "Pâtre du Cevennes" and "Plaine du Cantal"; then he found some success in mythological figure subjects, and his decorative paintings in the apartments of the Empress Eugénie were remarkable works of their kind. He also excelled as an etcher and lithographer. There is a very powerful engraving by him after the "Noce Juive" of Delacroix.

The other artists who have disappeared during this very fatal month are Delaplanche, Charles Gauthier, and Aimé Millet. It would occupy undue space to retrace the important part played in modern French sculpture by these eminent artists. Delaplanche was a pupil of Daret, Gauthier of Jouffroy, and Millet had studied under David d'Angers. They were all hard workers and enthusiasts in their art. Gauthier was eminently conscientious both as an artist and as a teacher, and his instruction was much sought after at the École des Beaux-Arts.

We have also to record the death, at the age of 72, of M. Laisné, Diocesan Architect and member of the Commission des Monuments Historiques, and a former professor at the Ecole des Beaux-Arts. M. Laisné occupied a considerable place in French architecture in his day; he was architect of the Lycée Janson at Sailly, the École Supérieure de Pharmacie, the Lycées of Cognac and Gueret, and carried out important restorations at the Cathedral of Sens, at Nôtre Dame at Dijon, at the École Supérieure of Cluny, &c. He was also eminent and much looked up to as a teacher at the École, and is much regretted as an able architect and a kind-hearted man.

BYZANTINE ARCHITECTURE.*

BY PROFESSOR AITCHISON.

Even if we had not some of the important buildings erected in the time of Constantine, we could form a shrewd guess of what they were like, for we roughly know what there was in Rome up to his time, and he began to reign but eight years (313) after the abdication of Diocletian (305), for we may call him reigning after the defeat of Maxentius in 313, and when he issued the edict giving liberty of public worship to the Christians. Diocletian's Palace at Spalato, and his Baths at Rome still remain, and Constantine's architects could only have altered a little, or improved a little, on what had immediately preceded them. We are also told that at Constantinople Constantine had palaces built like those in Rome and its vicinity to induce the Roman nobility to come and stay there. We know that he gave one of the private basilicas at Rome for the Church of San John Lateran, and that he had the original basilica of St. Peter's built. Vitruvius tells us what the basilica was like (Vit, Lib. V., cap. i., par. 4),

* Being the Second Royal Academy Lecture on Architecture this season. Delivered on Thursday evening January 29, 1891. For first lecture see p. 82, *ante*.

and that the private basilica was like it (Vit., Lib. VI., cap. v., par. 2); he began to write when the Republic still nominally existed, and important decisions had to be given by able Senators on what we should now call international questions. The private basilicas were then arbitration-rooms, where numerous deputations probably had to be seated, crowds of witnesses, and possibly many assessors, and they were also used for political meetings, but in Constantine's time I fancy they were a sort of music-hall. The Lateran Basilica was originally built by Lateranus, a senator of Nero's days. Besides the basilicas Constantine turned into churches or had built, he had other churches constructed after the fashion of the Circular Temple of Portunus at Ostia, and it is believed others of an octagonal shape, after the manner of the Golden Temple of Antioch. We also know that most of his buildings at Constantinople were roofed with wood, and so badly built that when they were not burnt they fell, or had to be pulled down; that he was so short of architects, that he granted immunities to those who would allow their sons to be brought up to that profession, and bestowed a salary on the students, and the edict for this applied to Italy and a great part of Northern Africa. The prevalence of building in his new capital, and in several parts of the empire, must have given, too, a great impetus to the immigration of architects into Constantinople, as well as into other cities where large building operations were being carried on.

We also know that the art of figure sculpture was at so low an ebb that statues from existing buildings were transferred to his triumphal arch in Rome, because there were no sculptors capable of doing them. We believe that there was not much change in the forms of churches for more than a century after his death, although the bema or sanctuary was made much deeper, and, perhaps, also the form of the Greek cross or the Tau was more insisted on, though it is stated that some of the civil basilicas at Rome had a transept in front of the apse which gives the Tau; this form is seen at the basilicas of St. Paul, outside the wall, and St. Mary the Greater at Rome. The present church of St. Demetrius, at Salonica, is said to have been built in 412-413. The Tau is made in this basilica by two enclosures in the aisles, just in front of the apse and at a higher level,—*i.e.*, at the level of the paving of the bema, which was always raised a step. The semi-circular atrium to St. Demetrius' tomb is domed after the fashion of the Temple of Jupiter at Diocletian's Palace, only here it was made ornamental, and evidently was meant to be seen, apparently pointing to a later date. Still an important step had been taken in regard to capitals, for there are some at St. Demetrius which we now look on as purely Byzantine. It is not, however, until we come to the reign of Justinian that we have any exact dates to rely on after the date of Constantine. Although archæology is not of any direct use to architecture, except where it is all the architecture there is, it is of the utmost importance that we should know the dates of buildings when we want to trace their influence on the plan, the construction, or the ornamentation of subsequent ones. Procopius has given us a list of some of the buildings erected by Justinian's order to within ten years of his death, and this includes St. Sergius and Bacchus at Constantinople (see lithograph), called "the little Sta. Sophia," whose interior is very similar to San Vitale at Ravenna. At first sight, the upper parts of the three flat sides of the octagon are scarcely noticed to be different from the apses. San Vitale is believed to have been begun the year before Justinian was associated with his uncle Justin as joint Emperor, and that when he was sole Emperor he and Theodora contributed funds for its completion; it is also said to have been designed on the plan of Constantine's Golden Temple at Antioch. I must tell you that the history of Byzantine architecture is in a perfect state of chaos as far as dates are concerned, and when we have exhausted Procopius' list of the buildings we can only make guesses at the dates of churches from this arrangement, construction, or ornamentation.

A list of the buildings erected by Constantine's order is given, I believe, by Eusebius, and in Ciampini are illustrations of the ecclesiastical buildings erected in his reign. Our Archæological School at Athens is now mainly devoting itself to the study of Byzantine architecture; its students, Messrs. Schultz and Barnsley, have for some time past been making drawings of the remaining Byzantine churches in Athens, Epirus, Macedonia, &c., including their mosaics; and Mr. Gardiner, the head of the school, has been assisting them in the deciphering of inscriptions. The school has been kind enough to lend me some of their beautiful and accurate drawings, which are now exhibited. It depends upon the interest the public takes in the subject as to how many of the drawings, how much of the subject, shall be published, and whether the study of it shall proceed or be abandoned, so I hope my hearers will give all the encouragement they can to this undertaking. Roman remains up to the days of Constantine have been fairly represented, but those from the dedication of Constantinople in 330 until the taking of Constantinople by the Turks in 1453, have hitherto been but meagrely represented, and no serious attempt has been made to obtain the dates of the existing buildings.

In the early Christian church the question was, where it could get a place to meet in without molestation, and we know that the catacombs at Rome were used for that purpose, and there was no thought then about orientation. As late as St. Augustine, who was born in the fourth and died in the fifth century, all that he asked for was a square room like the Ark of Noah, with a recess for the altar; but as early as Clement, at the end of the first century, the new churches were arranged, when they could be, like the temples are recommended to be by Vitruvius, with the entrance to the east. St. John Lateran and St. Peter's are so placed; the priest at the altar stood facing the congregation, and the women were put in the aisle to the left of the priest, or north side, and the men to the right, or south side. When the orientation was changed in the fifth century, and the altar was at the east end, the priest turned his back on the congregation, and though his hands were the same way as before, the right and left of the altar remained in their original position. This has introduced great confusion. S. Apollinare Nuovo, at Ravenna, is oriented with its front to the west and the altar to the east; but it is evident that the women were on the south side, and the men on the north, for their attention must have been directed to the examples of their own sex, and the procession of virgins is on the north and that of the saints on the south side of the nave, —*i.e.*, to the old right and left of the altar. The ambos were retained in the old places after the change of orientation, the Gospels being read from the left, or north ambo, and the Epistles from the right, or south. I should here say that the clergy had usurped the nave for its own use, and the congregation were left in the aisles, the nave being fenced off by a low balustrade; where Christian churches have been converted into mosques these balustrades are often found used for paving. Besides these arrangements, there was an atrium in front of the church with an impluvium, a labrum, a fountain, or a well in the middle for ablution, and a narthex at the entrance of the church for catechumens and penitents.

As the population gradually became Christian, the atrium, which was partly used for sheltering candidates for baptism and partly for ablution, was only needed for the second purpose, and began to fall into disuse; and when, in the seventh century, it was found that the Moslem faith prescribed ablution, it was given up altogether in the Christian Church. Extreme personal uncleanness then became almost synonymous with sanctity,—it showed, at least, the Christian's repugnance to this injunction of the Koran. We read of monks who were so holy that they had never been washed all over since they were baptised. The holy water stoup in Roman churches is said to be a relic of pristine ablution. In the early churches the baptistery was a separate building, outside the church; but eventually adult baptism was given up, and the font was admitted into the church. The altar originally stood just in front of the apse, and the apse itself was used for the clergy, and was called the Presbytery, with a seat all round it called the consistorium, and with a higher seat in the middle for the bishop; this arrangement may still be seen at St. Fosca, at Torcello, near Venice, and I believe is still used in the Orthodox or Greek Church. In the Orthodox church the altar was, and is still, merely a table with a crucifix on it; but in the Papal or Western Church, it became the martyrium, and was erected over the sarcophagus of a saint, or over the grave where his remains, bones, or fragments were buried. Eventually each aisle was consecrated as a separate church, and each had a little apse at the east end. The Basilica of San Pietro ad Vincula at Rome, said to have been built in 442, is, I believe, the first church in which this feature is seen, but I fancy if it were examined it would be found to be a much later alteration. The use of three apses became, and is now, universal in the Orthodox Church, but it does not exist at Sta. Sophia, at Constantinople, built in 532. It is, perhaps, not to be looked for in circular and octagonal churches, but it does not exist in the Basilica of San Demetrius at Salonica, though at the east end of its north aisle there is a little chapel with the three apses (which I could not get into), and there is only one little apse at the east end of the north aisle, besides the great central apse at the Great St. Mary's, now called Eski Djouma, at Salonica,—possibly a later addition; nor does this feature occur at St. Irene, St. John Studios, nor at the Kalender Mosque at Constantinople, so that if we are quite sure these small apses,—the French call them absidioles,—have not been added subsequently, it gives us some idea of the date of the church. The church at Dana, on the Euphrates, said to be built in Justinian's time, has only one, and not three apses, although it has a nave and two aisles.

It is, perhaps, as well to say here that Christian churches, after Constantine's edict, possessed the right of sanctuary, and I was told by a member of the Orthodox Church that the iconostasis was adopted for this reason,—that robbers, thieves, and murderers, when pursued, were accustomed to rush into a church and cling to the altar. To prevent this abuse the altar was protected by the screen and doors, called the iconostasis, so that sanctuary could not be obtained until the priest was satisfied that the claimant deserved the privilege.

The apse was originally without light, and was only lit from the nave or transepts. Justinian unfortunately had a dream that at Sta. Sophia it was to have three windows, though before his time windows had been put in the apses.

Since the Marquis de Vogüé published his work on Central Syria, great attention has been given to the buildings he found there, and to their influence on Eastern and Western architecture. These buildings of Central Syria, whether lay or ecclesiastical, were of stone, and most of their floors and ceilings were formed of stone slabs carried by arches, the roofs being mainly of concrete, though there are the ruins of churches that once had timber roofs; in short, we may say that where forests were at hand the architects used timber; but where no timber was to be had they made shift with stone, just as at Babylon they used burnt brick.

The Pretorium at Mousmieh is supposed to have been one type for early churches. This building consists of an open portico in front, with a nearly square chamber behind it, divided into a wide central nave and two narrow aisles. The nave is formed by four detached and four attached columns, each aisle by four attached columns, and those of one side of the nave; the central square of the nave is formed by arches resting on the four detached columns, and has over it a four-sided groined dome, of which only fragments remain. The base of this dome was abutted by four semi-circular vaults. Beyond the end of the central nave is an apse, and a small, square chamber at the end of each aisle. This building is said to have been erected between 161 and 169, in the days of Marcus Aurelius and Lucius Verus, and is consequently Roman. A great number of Christian churches have also been found, but there is very little external evidence to show their date. One little chapel at Omm-es-Zeitoun, built in the year 282,—*i.e.*, before the days of Constantine,—was domed on a square plan, but the circle is obtained from the square by corbelling at the angles, and not by pendentives.

It is worth noticing that though the Roman Empire, after the loss of the western part, extended over the exarchate of Ravenna, Asia Minor, Syria, Palestine, Egypt, and a part of the north littoral of Africa, till the invasion of Syria by the Moslems in the reign of Heraclius (634 A.D.), yet there seems to have been no uniformity of style or method of building. Special local schools seem to have existed, that produced special forms of churches, partly influenced by the materials at hand, and partly by the existing types. In 515 or 516, the baptistery of St. George at Ezra was built, an

oblong-square building, consisting of two concentric octagons, with two vestries and an apse, wholly built of squared stone, the inner octagon being domed over in rubble with an oviform dome, circular on plan like the Persian domes; a very similar baptistery, cathedral, or church is found at Bozrah, in the Hauran, said to be of the year 512, or preceding that of St. George of Ezra, only circular instead of octagonal in plan. Some believe that the baptisteries or churches of this shape were built after the fashion of the Holy Sepulchre at Jerusalem. This was built by the orders of Constantine in 326, and was destroyed by Chosroes II., the king of Persia, in 614, some twenty years before the Arab invasion. The controversies on the shape and position of the Holy Sepulchre still continue, so I will leave the subject alone.

I may say that most of the Syrian churches had but one apse, and mostly two square chambers on each side like those at the Prætorium at Mousmieh, and that the basilica at Behio (Central Syria) has a square apse. These Syrian buildings from 330 to 635 are technically Byzantine, but have not much resemblance to those built elsewhere.

We must believe that the numerous schools of architecture started by Constantine had great influence on architecture, and must have made the architects more scientific; we must also recollect that there had been a greater and greater inclination at Rome to make public buildings uninflammable by vaulting and doming. The baths had all their halls or chambers vaulted or domed, and the basilica of Maxentius finished by Constantine was wholly vaulted and domed. We also know that building gradually became more scientific, for there was a gradual diminution in the ratio of the supports to the total area, for while the ratio of Caracalla's baths is ·176, that of Diocletian's is ·167, and the Basilica of Maxentius ·127. Still, if we are to believe Œlius Spartianus, who lived about 297, in the days of Maximinianus and Constantius the Green, the architects had in certain respects fallen off in skill, for he says they confessed they were unable to rival the solar cell of Caracalla's Baths. I mention this prevalence of incombustible structures at Rome because so many of Constantine's buildings at Constantinople appear to have been roofed with wood, and the only reason that can be assigned for this is his haste and the want of skilled architects. Two processes seem to have been going on between the time of Constantine's brief (334 A.D.) for starting architectural schools, and the accession of Justinian in 527 A.D., namely, the Church seems to have been settling the best form of building for its ritual while the architects were perfecting themselves in domical construction and its abutments, and they were learning how much piers of brick and stone and monolithic columns of marble would carry. The octagonal church at San Vitale at Ravenna is said to have been founded by Ecclesius in 526, the year Theodoric the Great died, and consecrated by Maximianus, the Archbishop of Ravenna, in 547, eight years after the taking of Ravenna by Belisarius; the Emperor Justinian and Theodora are said to have been at its opening; it is very similar in plan to Minerva Medica at Rome, but is said to have been built after the model of Constantine's Golden Temple at Antioch. It consisted of an oblong narthex, two storeys high, flanked by two round towers containing staircases; for the long narthex set askew, and now I believe pulled down, is said to have been modern. The church is an octagon about 118 ft. across. Inside the external octagon is another concentric to it which supports the dome, about 50 ft. in diameter, with seven of the sides of the octagon formed into semi-circular apses, two storeys high, and each supported by a triple arcade with two columns on each storey. The seven openings have semi-circular arches at the level of the roof of the gallery, the eighth side forms the sanctuary with a projecting apse at its end, the triumphal or sanctuary arch rises to the height of the arches over the apses, and on either side of the sanctuary are two staircases, and beyond them two circular vestries or chapels. The space between the outer and inner octagons form the aisles, and over these are galleries—one side at least was originally meant for the women, if not both. The octagon sides run up and are brought into the circle by small pendentives, from which a hemispherical dome rises, roofed outside with a hipped timber roof; the bottom of the dome is pierced with eight two-light windows. The arch to the sanctuary runs up the two storys, and just above it the sanctuary roof is groined as far as the apse, which is domed over at a height that will allow of a window over it. The parts to the north and south, between the arch and the apse, have three-light openings in two storeys on each side. The aisles have barrelled vaults, into which the openings of the outer windows and the arches of the seven apses groin. The walls of the aisles are cased with marble in panels; these panels are streaked in red and white, and believed by Mr. Brindley to be Rosso Antico, and are formed of slabs in two or four pieces so as to make a pattern.

On the sides of the triumphal or sanctuary arches are fine Classic bas-reliefs of Cupids, one with a trident (engraved on plate 148 of Moses Vases, 4to, London, 1814), and are said to have been taken from a temple of Neptune, for San Vitale is said to have been built on the site of a temple to that god. There are green porphyry pilasters imbedded amongst the marble linings of the lower aisles, and a superb circular piece of opus Alexandrinum of red porphyry inlaid with mother-o'-pearl, giallo antico, and fine stones of red, green, and blue. The whole of the sanctuary is covered with superb mosaic; two panels at the back of the altar represent, on the right, Justinian with his guards and officers; and on the left side, Theodora about entering the Church of San Vitale. She is sumptuously dressed, and has a robe of the Imperial purple embroidered in gold at the bottom as a border, with the adoration of the Magi. The groined vault over the altar has the most beautiful ornamental mosaic I have ever seen. All the columns have carved blocks over their capitals. Many of the caps are Byzantine; the upper blocks are in some cases carved with a cross and two lambs. Procopius tells us that the churches of SS. Sergius and Bacchus, at Constantinople, were built by Justinian. One was basilica shaped, and has been destroyed, the other consists of an open Turkish porch, a narthex, and the church with a projecting apse. The church itself is an irregular oblong square on the skew, about 95 ft. by 112 ft. with the narthex; it has an octagonal centre; the outer oblong square is made into an irregular octagon by four large niches in the angles, the seven sides of the inner octagon are treated as follows:—The side opposite the entrance has a triple opening with two columns, and this is repeated on the two other square sides, the diagonal sides have semi-circular apses, also supported by two columns, and the whole of the ground-floor has an entablature. The eighth side is occupied by the sanctuary, with a semi-circular apse at the end, the arch of which goes up to the springing of the dome. The first-floor over the aisles is much higher than the ground story, and is treated in the same way, only the triple openings are arcaded, and seven semi-circular arches rising from the level of the caps of the columns connect the whole. Between these arches are the spherical pendentives, supporting a semi-circular dome, fluted with sixteen flutes; each flute dies against the vertical wall, and in each alternate arch so formed is a single window. The upper gallery goes over the narthex. The entablature, which is of marble, has an enriched architrave. The frieze is divided in two, the lower part being a torus with fillets, ornamented with the Byzantine acanthus scroll, and a flat surface above with a Greek inscription.

The cornice has an ornamented cyma without a fillet below; the corona is replaced by cantilevers; below them is an ornamented bead with a dentil band and fillet below. Eight of the columns are of Verde antique, the rest appear to be synnadic; the capitals are Byzantine, those of the upper galleries are of the splayed cubic shape enriched with ornament and with a sort of dwarf Ionic capital below them. The joints of the columns between the bases and caps are filled with lead. It is a very striking church as far as its internal design is concerned, but it is at present whitewashed; it is hoped the mosaic exists below the whitewash. The dome is a hemisphere about 54 ft. in diameter.

We must probably look to Asia Minor to find where Anthemius and Isodore made their maiden essays; for when Justinian first decided on the new Sta. Sophia, Anthemius seems to have had no hesitation in making his model; and, though Procopius tells us that he and Isodore met with great difficulties from the unprecedented weights to be carried, they successfully completed the building; and this, as far as we now know, was the first great European building with spherical pendentives, the original dome, too, being the flattest ever built (see lithograph). Architects will admit that less than forty days was not much time for making a model of an original building with one of the largest and flattest domes ever built. I beg to draw your attention to a model being the oldest and best way of showing a design. It was from a model that Sta. Maria-dei-Miracoli at Venice was built, and Sir Christopher Wren recommends a model to be made for all important buildings.

The buildings forming the church of Sta. Sophia and its dependencies were as follows:—An open atrium, surrounded on its three sides by a peristyle, and having in the middle of its open area a cistern or fountain, an exo-narthex, a narthex preceding the church, the church, and a passage at the back of it; on the south side a range of buildings, and attached to these, at the west end, but further south, the baptistery. (O).

The buildings on the south side, beginning at the west end, were as follows:—A staircase for the superior catechumens (P), the vestibule to the narthex (I), a passage and court (J), the clock-room (K), the holy well (L), the metatorion or large hall (M), the triclinum Thomäites (N), and a wooden staircase for the superior catechumens (13), forming a communication between the galleries of Sta. Sophia, Sta. Maria Chalcopratiana, and the Palace. The exo-narthex is about 19 ft., the narthex about 30 ft. wide, and both are about 200 ft. long; the height of the narthex is 43 ft., and is lit by nine windows above the roof of the exo-narthex; the church is about 262 ft. long externally, exclusive of the narthex and the projection of the apse, or 278 ft. long to the outside of the apse, and about 240 ft. wide. The nave consists of an oblong square, 110 ft. wide by 103 ft. long, with two vast hemicycles about 103 ft. in diameter at the east and west ends; and each of these have a subsidiary apse on each side, about 42 ft. in diameter, each supported by arches on two columns, and the square openings in the middle of the hemicycles are about 48 ft. wide, the eastern one ending in an apse about 40 ft. in diameter, with two tiers of windows in it, as well as windows in its semi-dome. The aisles, in the clear of the walls and front columns, are about 56 ft. wide.

The dome is about 103 ft. in diameter and 48 ft. high in the clear, and is lit at its base by forty windows, and is carried by the four arches of the nave, and the four vast spherical pendentives—four enormous piers about 35 ft. long over all and about 25 ft. thick at their widest point—have each a quarter of the weight of the dome, one arch and a pendentive to carry, the two projecting piers at the back of the first main pier are nearly 6 ft. square. These main piers, 25 ft. by 65 ft., are hollowed out by an oblong chamber about 13 ft. by 30 ft., and by the openings for the aisle and to the window, and have a net area of about 1,110 ft. super; they carry a portion of the gallery as well, but the external part of the pier is mainly an abutment. From the pavement to the crown of the dome is 185 ft.; but this is the new dome which was put up by the nephew or grandson of Isodore, and is said to be 25 ft. higher than the original one.

If you look at the plan of St. Sergius and Bacchus, you will see how well it deserved the title of "The little Sta. Sophia." It is an oblong square outside, with a projecting apse at the east end like Sta. Sophia, and if you cut the church in two in the middle on a line running north and south, and remove the two halves far enough away from each other to get in two more columns and arches, and turn the two half hexagons into semi-circles, you would have the precise form of the nave of Sta. Sophia, and to complete the resemblance you have only to clear away the angle niches of the aisles and insert four columns; only as Sta. Sophia has a nave about 110 ft. wide, and St. Sergius and Bacchus has its nave only about 53 ft. 6 in., with a hemispherical dome of the same diameter, all the supporting parts of the former had to be very much larger: if we take two of the angle piers of St. Sergius and Bacchus their sectional area together is about 95 ft., while the front half of one of the angle piers at Sta. Sophia has a sectional area of 537 ft., and this was not a brick or rubble pier, but one built of solid stone.

Returning to Sta. Sophia, you enter the

narthex at one end, and walk down this magnificent gallery, lined with slabs of lovely marble, panelled by means of projecting slips of white marble ornamented with what has been called the Venetian dog-tooth, capped with a carved marble string and pietra dura work. The groined vault of the narthex is covered with gold mosaic enriched with silver and colours. As you walk down it, you come to the bronze-plated jambs of the royal doorway in the centre, and step into the church. The sight that then meets your eye is thrilling, partly from its magnificence, but mainly from its overwhelming vastness. You are in a hall 110 ft. wide,—a width of hall you have never seen before, and, though the length is 265 ft., the eye embraces it at once, and the whole of the vast space is absolutely without anything intervening between you and the end of the apse, while above your head is the immense dome, seemingly supported on nothing, and below the arch is the crescent of the hemicycle, with its windows; the bulk of the light is overhead or screened by the columns of the aisles, and the windows in the apse, being partly of stained-glass, are not at first obtrusive, as you naturally throw up your head; the whole interior is lined with beautiful marbles, panelled like the narthex, and with pietra dura work in splendid patterns; the screen columns are monoliths of verd antique from Ephesus, presented by Constantine, the prætor of that city. The columns of the apses are of purple porphyry banded with bronze, and were presented to Justinian by a wealthy Roman widow named Marcia; they were probably taken from Palmyra by Aurelian to adorn his Temple of the Sun at Rome. The domes and vaults, as well as the walls above the marble lining, are adorned with gold mosaic enriched with slight patterns in colour. There is a subdued magnificence about the effect that is enchanting, though I believe the effect would be improved by repolishing the marble, as at present, the gold mosaic of the upper part overwhelms the dim pale colour of the lower marble work. It is not, however, until you go up into the galleries, each 250 ft. long by 60 ft. wide, besides the upper narthex 200 ft. long by 26 ft. wide, that you are fully aware of the vastness of the structure, and the altitude of the building is also better observed there, for although you are only 43 ft. above the pavement, the chandeliers with which the mosque is filled seem to touch the ground, and yet you seem no nearer to the dome; almost every trace of figures has been obscured by the Mussulmans,—the very heads of the six-winged cherubims have been replaced by mosaic stars.

Justinian's pious boast when he opened the church, "Glory be to God who has thought me worthy to accomplish so great a work; I have vanquished thee, O Solomon!" strikes us as being only too modest, for he had caused to be erected a temple as superior in science and effect to Solomon's Temple, as the Pantheon is to an Indian wigwam,—he had in fact caused to be produced one of the wonders of the world.

In the description I have just given I tried to convey the impression made upon me on entering the church. There are, however, a few more particulars I should like to give you, although you can see most of these from the diagrams (see section of Sta. Sophia). The upper story is only five-sevenths of the lower one, and to make the arcades of the nave in tolerable proportion, six columns have been put over the four beneath, and round the upper apses of the hemicycle there are six columns over the two below, the effect of which is satisfactory. The height to the crown of the four main arches of the nave is not a fourth more than their width. The screen walls, which fill in the north and south aisles, above the upper arcades, are pierced with two ranges of circular-headed windows, so that the whole of the upper part is flooded with light. In looking from the floor of the nave at the arcades you are satisfied with them, but in looking down at the lower ones from the end gallery the capitals do not profile well; there is a want of style and accent about them which makes the whole of that piece of the composition look tame and feeble.

In the aisles, the twelve columns have rather the appearance of having been put in after the work was done; the position of eight of them has a sort of haphazard look, which is intensified by two of each, four being square piers, while the other two are round columns. One of the round ones of each group of four is nestled into a corner by the solid part of the subsidiary apse. The extra weight the square piers have to carry seems hardly a sufficient reason for making them square; still they are not unsightly.

The two inner columns of the screen, and the two behind them, tell their story well,—they act as stiffeners to the screen-wall, but, as in the aisles and the galleries, the columns had to be shorter than the screen ones to get in the groined vaults, ingenious devices have been hit on to accomplish this: in the aisles the arches between the front columns and the back ones are quadrants, in the galleries the difference of height is got over by each line of columns having its own wall over it, and these walls are joined at a higher level by a small barrel vault. The galleries show, alas! too many signs of the effect of the earthquakes with which Constantinople has been afflicted; vaults have opened, columns have been pushed out of the upright, and the marble slabs of the floors have cracked and sunk: these appearances, together with the iron ties, besides the original wooden ones, tell their own tale. The floor of the church is completely hidden, like that of all mosques.

It is, perhaps, hardly fair to criticise the outside, as it is doubtful if it was ever finished, and since the completion of the church many additions have been made to increase its stability. The dome being planted on a square terrace is depressed by the perspective, and you only see a flat segment rising above the buttresses at the sides of the windows of the dome. The narthex, with its large semi-circular windows divided by a transum and columns, looks like a riding-school or a factory; the enormous buttresses below hardly explain themselves, and are not lovely to look on. The north and south sides have each two enormous towers reaching to the terrace of the dome, the last stories being round-headed; these towers almost look as if they were of pre-historic times; between them the circular-headed walls of the aisles are filled with vast circular-headed windows, and look as if they were workshops added to a railway station. The whole exterior is covered with whitewash and narrow stripes of ruddle. Externally you would take it for a factory, or an overgrown railway station, added to by an engineer. It is not unpicturesque, as seen from the entrance to the Bosphorus, with the sun setting behind it; you see a heavy square reddish lump with a flat dome, but it compares very unfavourably with the fine outline of the great Turkish mosques.

It will, I think, be now interesting to hear the account Procopius gives of the difficulties encountered in the building. These difficulties, if real, show that the architects were not very perfect in their knowledge, or, if the difficulties were imaginary, that they were adroit courtiers. There is something dramatic in human difficulties and emotions that attracts our attention and enlists our sympathies, while these sympathies are not touched when the skill of the architects is so great that we hear of nothing but the completion of the building. Viollet-le-Duc sneers at the twelfth-century architects, who were always seeing visions, or having angels visit them to help them out of their difficulties; but for that very reason we feel a personal interest in them, and a kindliness towards them which we do not feel towards their more skilful successors. There is hardly a passage of such interest in the whole thirty-seven books of Pliny's "Natural History" as that in which he recounts the architect's trouble with the lintels when he was building the Temple of Diana of the Ephesians. Pliny says:—"The great marvel in this building is, how such ponderous architraves could possibly have been raised to so great a height." This, however, the architect effected by means of bags filled with sand, which he piled up upon an inclined plane until they reached beyond the capitals of the columns; then, as he gradually emptied the lower bags, the architraves insensibly settled in the place assigned them. But the greatest difficulty of all was found in laying the lintel which he placed over the entrance door. It was an enormous mass of stone, and by no possibility could it be brought to lie level upon the jambs which formed its bed; in consequence of which, the architect was driven to such a state of anxiety and desperation as to contemplate suicide. Wearied and quite worn out by such thoughts as these, during the night, they say, he beheld in a dream the goddess in honour of whom the temple was being erected; who exhorted him to live on, for that she herself had placed the stone in its proper position; and such in fact, next morning, was found to be the case, the stone apparently having come to the proper level by dint of its own weight (Pliny, "N. H.," Book xxxvi., cap. 21).

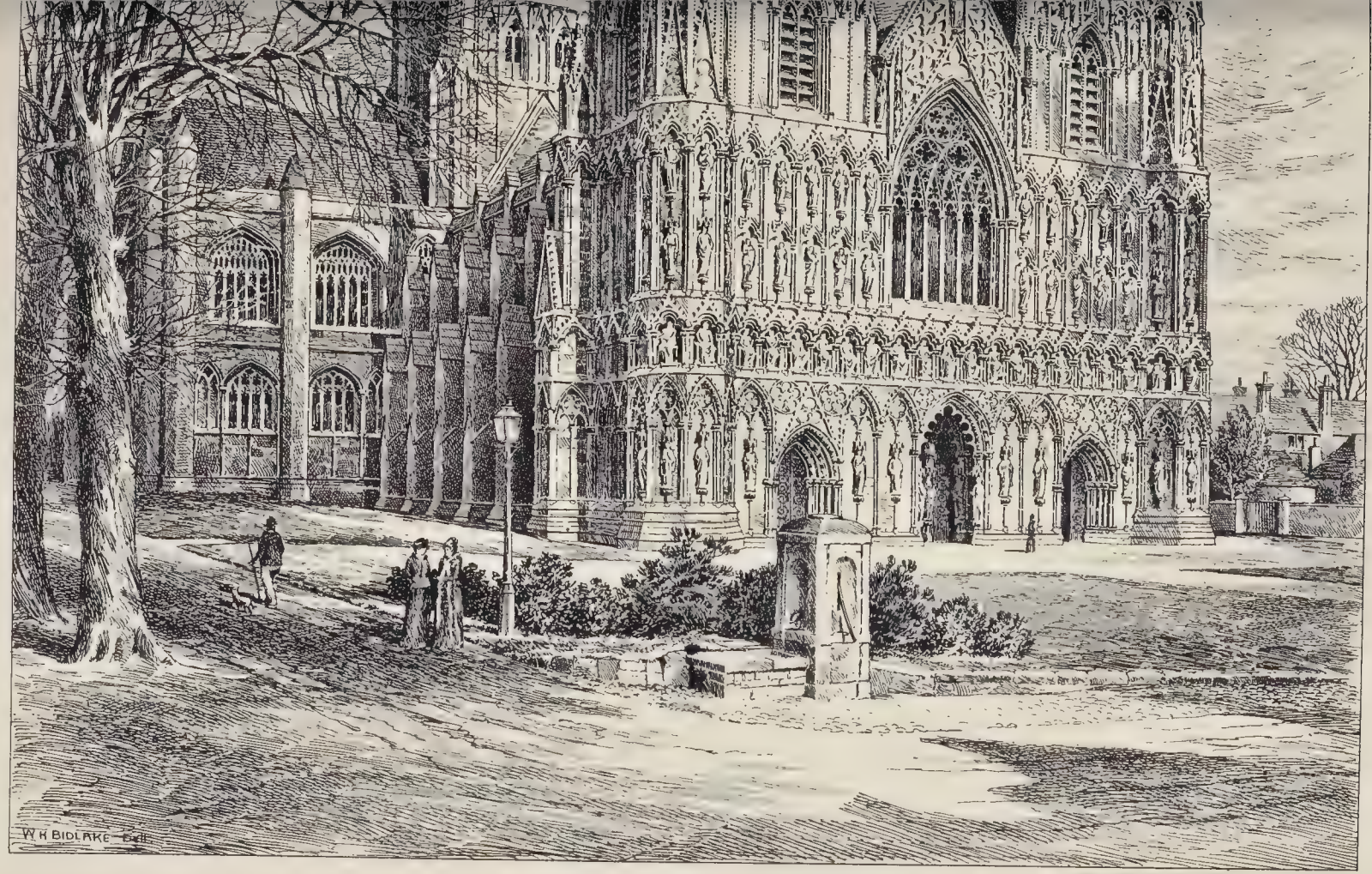
We must be thankful for small mercies in the way of contemporary history of architecture, as we mostly have none at all; but when we know that Procopius had been the secretary of Belisarius, on whose courage and skill the very existence of the Byzantine Empire depended, and that he subsequently became a senator and prefect of the city, we think he might have learned the names of the parts he describes and the real particulars from the architects themselves; but he behaved just like a modern historian does who describes battles,—there are pages, if not chapters, describing the charges and the carnage, but when you have read the description you do not see why the losing side should not have won. The historian never thinks of asking a master of the art of war the causes of the victory. I now give you extracts from Procopius about the method of building the piers, and about some of the troubles encountered; he speaks, in the first place, of the main piers supporting the four great arches, as follows:—"The Emperor Justinian and the architects Anthemius and Isodorus used many devices to construct so lofty a church with security. One alone of these I will at this present time explain, by which a man may form some opinion of the strength of the whole work. As for the others, I am not able to discover them all, and find it impossible to explain them in words. It is as follows:—The piers of which I just now spoke are not constructed in the same manner as the rest of the building, but in this fashion: they consist of quadrangular courses of stones, rough by nature, but made smooth by art. Of these stones, those which make the projecting angles of the pier are cut angularly, while those which go in the middle parts of the sides are cut square. They are fastened together, not with what is called unslaked lime, not with bitumen—the boast of Semiramis at Babylon,—nor anything of the kind, but with lead, which is poured between the interstices, and which, pervading the whole structure, has sunk into the joints of the stones, and binds them together: this is how they are built." I may say on this, than Professor Unwin has found by experiment that lead is the worst material that can be used to bed stone on.

Procopius then goes on as follows to tell us of the behaviour of these piers, while the arches were being turned:—"The above is an account, written in the most abridged and cursory manner, describing in the fewest possible words the most admirable structure of the church at Constantinople, which is called the Great Church, built by the Emperor Justinian, who did not merely supply the funds for it, but assisted it by the labour and powers of his mind, as I will now explain. Of the two arches which I lately mentioned (the architects call them 'lori'),—that one which stands towards the east had been built up on each side, but had not altogether been completed in the middle, where it was still imperfect. Now, the piers upon which the building rested, unable to support the weight which was put upon them, someho wall at once split open, and seemed as though before long they would fall to pieces. Upon this, Anthemius and Isodorus, terrified at what had taken place, referred the matter to the Emperor, losing all confidence in their own skill. He, at once, I know not by what impulse, but probably inspired by Heaven, for he is not an architect, ordered them to carry round this arch; for it, said he, resting upon itself, will no longer need the piers below.

Now, if this story were unsupported by witnesses, I am well assured that it would seem to be written in order to flatter, and to be quite incredible; but as there are many witnesses now alive of what then took place, I shall not hesitate to finish it. The workmen performed his bidding, the arch was safely suspended, and proved by experiment the truth of his conception."

I may say here that if this application to Justinian was not an adroit piece of flattery, and the architects were really in anxiety, they must in the first place have greatly trusted to luck, for in modern practice the architects would have made themselves sure that the piers would carry the weight before a stone was laid. Next, if they were really alarmed, why did they consult Justinian? unless, indeed,





Cathedrals of England and Wales.

No. 2. LICHFIELD.—Drawn by Mr. W. H. Bidlake.

the old fiction of the Roman Emperors being gods was still believed, for Procopius says Justinian was no architect. This splitting open as though it would fall to pieces may have been an exaggeration of Procopius. There may have been some slight cracking or scaling from imperfect bedding that the architects were not really alarmed about. We see what Justinian thought, that when the arches were complete they were held up by vertical friction against the piers. If the piers absolutely split open what did it mean? Procopius tells us nothing but the fact, and leaves us to infer that no reparations were made. We naturally suppose that all the work was carried up evenly to the same height, and that if serious settlements took place, that it was from the arches being on a comparatively small surface, which caused the foundations and that part of the pier to compress, and so tore it away from the adjoining part; but, if this were so, they would hardly have dared to let it remain, so I think the uneven pressure caused a few hair cracks which were exaggerated by common rumour, for if these piers had split through, and looked as if they would tumble to pieces, we can hardly imagine that the architects would have ventured to complete the arches upon them and put a dome on the top as well. Procopius goes on to say:—"So much, then, for this part of the building; now, with regard to the other arches—those looking to the south and to the north—the following incidents took place: When the arches (called 'lori') were raised aloft during the building of the church everything below them laboured under their weight, and the columns which are placed there shed little scales, as though they had been planed. Alarmed at this, the architects again referred the matter to the Emperor, who devised the following plan. He ordered the upper part of the work that was giving way where it touched the arches to be taken down for the present, and to be replaced long afterwards when the damp had thoroughly left the fabric. This was done, and the building has stood safely afterwards, so that the structure, as it were, bears witness to the Emperor."

This case is very simple, the arches were probably of brick, and while coming to their bearings pressed on the screen wall, filling the space between the piers, and caused a scaling of the columns at top and bottom; many now have bronze rings on the necking, and at the base. Justinian's advice was right; but we cannot believe the architects did not know what to do in such a case; probably the whole thing from beginning to end was a judicious piece of flattery to allow the Emperor to exhibit his extraordinary wisdom.

THE LONDON COUNTY COUNCIL:

ADOPTION OF NEW BUILDING BY-LAWS.

THE usual weekly meeting of the London County Council was held on Tuesday afternoon, Sir John Lubbock in the chair.

The Building Act Committee reported that—

"By section 31 of the Council General Powers Act, 1890, power is given to the Council to make By-laws relative to the following matters:—(1) the description and quality of the substances of which plastering is to be made; (2) the mode in which, and the materials with which, any excavation made within a line drawn outside the site of a house, building, or other erection, and at a uniform distance therefrom of 3 ft., is to be filled up; (3) the duties of District-Surveyors in relation to plastering or excavation, and the regulation of the amounts to be paid to District-Surveyors in respect of the duties imposed upon them by any such By-laws. We have prepared draft by-laws relative to these matters, and submit the same with this report. We have also amended the existing By-laws made under section 16 of the Metropolis Management and Buildings Acts Amendment Act, 1878, with reference to foundations and sites of buildings, &c., and submit the same for approval. We recommend—

'That the proposed new and amended By-laws be made by the Council; and that the Committee be authorised to take the necessary steps for obtaining confirmation of the same, under the provisions of section 16 of the Amendment Act of 1878.'"

The recommendation was unanimously adopted, without discussion.

The following is the text of the By-Laws to be submitted to the Home Secretary for confirmation:—

"Description and Quality of the Substances of which Plastering is to be made.

All laths used for plastering shall be sound split laths free from sap, but iron or other incombustible laths, wire netting, or other suitable material to the satisfaction of the District Surveyor may be used.

Plastering or coarse stuff shall be composed of lime and sand in the proportion of 1 of lime to 3 of sand, mixed with water and hair, but Portland cement, Keene's cement, Parian cement, Martin's cement, Selenitic cement, or other approved cement or plaster of Paris, may also be used for plastering.

The lime to be used must be freshly-burned lime.

The sand to be used must be clean, sharp sand, free from loam or earthy matter.

The hair to be used must be good and sound, and free from grease or dirt; 1 lb. of hair to be used to every 3 cubic feet of coarse stuff.

The setting coat shall be composed of lime or cement mixed with clean washed sand, or of cement only.

Clear water only is to be used in mixing the material.

The Portland cement to be used must weigh not less than 90 lbs. to the imperial bushel.

Fibrous slab or other slab plastering of sufficient thickness, and securely fixed, may be used on ceilings, partitions, and walls, to the satisfaction of the District Surveyor.

As to the Mode in which and the Materials with which any Excavation Outside the Site of a Building is to be Filled Up.

Any excavation made within a line drawn outside the site of a house, building, or other erection, and at an uniform distance therefrom of 3 ft., shall be filled up with the natural soil or with brick or dry rubbish or other suitable material to be approved by the District Surveyor, not consisting of, nor impregnated or mixed with any fecal, animal, or vegetable matter, or with dust or slop or other refuse, and shall be properly rammed.

Duties of District Surveyors.

It shall be the duty of each District Surveyor on receiving notice of the commencement of any house, building, or other erection, or on his becoming aware that any house, building, or other erection is being proceeded with, or that any excavation is being made within a line drawn outside the site of a house, building, or other erection and within 3 ft. therefrom, to see that the plastering is of the description and quality prescribed by, and that any excavation is filled up with the material and in the manner specified in the foregoing By-laws.

Fees to be paid to District Surveyors.

There shall be paid to the District Surveyor in respect of his supervision of the plastering of any house, building, or other erection, and in respect of the filling in of any excavation made outside the site of any house, building, or other erection, and within a distance of 3 ft. therefrom an inclusive fee of 5s., such fee to be payable in the manner and at the time specified in section 61 of the Metropolitan Building Act, 1855.

Penalties.

In case of any breach of the provisions contained in these By-laws, the offender shall be liable for each offence to a penalty not exceeding five pounds, and, in each case of a continuing offence, to a further penalty not exceeding forty shillings for each day after notice of such offence from the London County Council or the District Surveyor.

Repeal of previous By-laws.

The heretofore subsisting By-laws made by the Metropolitan Board of Works on October 3, 1879, and January 22, 1886, and confirmed by the Secretary of State for the Home Department on October 6, 1879, and June 23, 1886, are hereby repealed, and in lieu thereof the following are made:—

Foundations and Sites of Buildings.

No house, building, or other erection, shall be erected upon any site or portion of any site which shall have been filled up or covered with any material impregnated or mixed with any fecal, animal, or vegetable matter, or which shall have been filled up or covered with dust, or slop, or other refuse, or in or upon which any such matter or refuse shall have been deposited, unless and until such matter or refuse shall have been properly removed, by excavation or otherwise, from such site. Any holes caused by such excavation must, if not used for a basement or cellar, be filled in with hard brick or dry rubbish

The site of every house or building shall be covered with a layer of good concrete, at least 6 in. thick, and smoothed on the upper surface.

The foundations of the walls of every house or building shall be formed of a bed of good concrete, not less than 9 in. thick, and projecting at least 4 in. on each side of the lowest course of footings of such walls. If the site be upon a natural bed of gravel, concrete may be omitted from the foundations of the walls, with the approval of the District Surveyor.

The concrete must be composed of clean gravel, broken hard brick, properly burnt ballast, or other hard material to be approved by the District Surveyor, well mixed with freshly burned lime or cement in the proportions of 1 of lime to 6, and 1 of cement to 8 of the other material.

Description and Quality of the Substances of Walls.

The external walls of every house, building, or other erection shall, except in the case of concrete buildings, be constructed of good, hard, sound, well-burnt bricks, or of stone.

Similar bricks shall be used in the portions of party and cross walls below the surface or level of the ground, and above the roof, including the chimney stacks. Cutters or malms may be used in arches over recesses and openings in, or for facings of, external walls.

Stone used for the construction of walls must be free from vents, cracks and sand-holes, and be laid on its natural bed.

All brick and stone work shall be put together with good mortar or good cement.

The mortar to be used must be composed of freshly burned lime and clean sharp sand or grit, without earthy matter, in the proportions of 1 of lime to 3 of sand or grit.

The cement to be used must be Portland cement, or other cement of equal quality, mixed with clean, sharp sand or grit, in the proportions of 1 of cement to 4 of sand or grit.

Burnt ballast or broken brick may be substituted for sand or grit, provided such material be properly mixed with lime in a mortar mill.

Every wall of a house or building shall have a damp-course throughout its whole thickness, of asphalte, or other material impervious to moisture. The damp-course in external walls shall be at a height of 1 ft above the level of the ground directly abutting upon the external wall, and in the party and internal walls at a level of not less than 6 in. below that of the lowest floor.

The top of every party-wall and parapet-wall shall be finished with one course of hard, well-burnt bricks set on edge, in cement, or by a coping of any other waterproof and fire-resisting material, properly secured.

Whenever concrete is used in the construction of walls, the concrete used shall be composed of Portland cement and of clean Thames or pit ballast, or gravel, or broken brick or stone, or furnace clinkers, with clean sand, in the following proportions, viz., 1 part of Portland cement, 2 parts of clean sand, and 3 parts of the coarse material, which is to be broken up sufficiently small to pass through a 2-in. ring.

The proportions of the materials to be strictly observed, and to be ascertained by careful admeasurement; and the mixing, either by machine or hand, to be most carefully done with clean water, and, if mixed by hand, the material to be turned over dry before the water is added.

The walls to be carried up regularly and in parallel frames of equal height, and the surface of the concrete filled in the frame to be left rough and uneven to form a key for the next frame of concrete.

The thicknesses of concrete walls to be equal at the least to the thicknesses for walls to be constructed of brickwork prescribed by the 12th section in the First Schedule of the Metropolitan Building Act, 1855.

Such portions of concrete party-walls and chimney-stacks as are carried above the roofs of buildings to be rendered externally with Portland cement.

Duties of District Surveyors.

It shall be the duty of each District Surveyor, on receiving notice of the commencement of any house, building, or other erection, or of any alteration or addition, or on his becoming aware that any house, building, or other erection, or any alteration or addition, is being proceeded with, to see that the provisions of the foregoing By-laws are duly observed (except in cases where the London County Council may have dispensed with the observance thereof), and to see that the terms and conditions upon which any dispensation may have been granted, are complied with.

Fees to be Paid to District Surveyors.

The District Surveyor shall in respect of the erection of any house or other building be entitled to receive the sum of five shillings, the same to be taken and deemed to be a fee due to such District Surveyor in respect of the duties imposed upon him by the Metropolis Managements and Building Acts Amendment Act, 1878, and these By-laws; such fee to be payable in the manner and at the time prescribed by section 61 of the Metropolitan Building Act, 1855. The District Surveyor shall also, in every case where in respect of any breach of these By-laws, or of the above Act of Parliament, an application shall have been made by him to a Justice, and an order made thereon, be in like manner entitled to receive the sum of ten shillings in addition to the before-mentioned fee of five shillings.

There shall be paid to the District Surveyor, in respect of his supervision of any building constructed wholly or in part with concrete walls, a fee, one-half more in amount than the fee to which he would be entitled under the Metropolitan Building Act, 1855, for new buildings or additions. No additional fee is, however, to be charged in respect of any alteration to a concrete building.

Deposit of Plans and Sections.

On notice being given to a District Surveyor of the intended erection, re-erection, alteration of, or addition to a public building, or a building to which section 56 of the Metropolitan Building Act, 1855, applies, it shall be the duty of the person giving such notice to deposit plans and sections of such erection, re-erection, alteration or addition with the District Surveyor. Such plans and sections shall be of sufficient detail to show the construction.

On notice being given to the District Surveyor of the intended erection or alteration of or addition to any house, building, or other erection, other than a public building, the District Surveyor may, if he think fit so to do, by notice in writing, require the person giving such notice to produce a plan or plans and sections of any such house, building or other erection, or of the intended alterations or additions thereto, for his inspection.

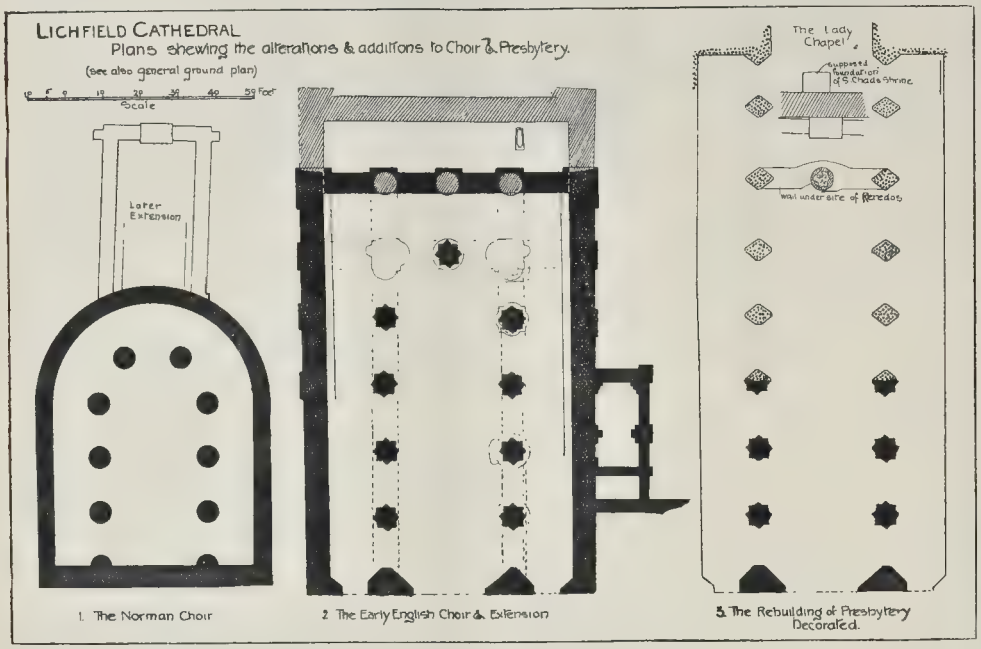
Penalties and Dispensation.

In case of any breach of any of the provisions contained in these By-laws, the offender shall be liable for each breach to a penalty not exceeding five pounds, and in each case of a continuing offence, to a further penalty not exceeding forty shillings for each day after notice of such offence from the London County Council or the District Surveyor.

In any case in which the Council think it expedient they may dispense with the observance of any of the foregoing By-laws, or any part thereof, upon such terms and conditions as they may think proper, and in case of the non-observance of any terms and conditions upon which the Council may have dispensed with the observance of any of the foregoing By-laws, then such proceedings may be taken, and such liabilities shall be incurred, as if the same had been enacted by such By-laws."

After transacting a great deal of other business, the Council adjourned.

THE IMPROVED INDUSTRIAL DWELLINGS COMPANY (LIMITED).—The directors of the Improved Industrial Dwellings Company (Limited), have issued their annual report, and recommend the usual dividend at the rate of 5 per cent. per annum on the stock, and a like dividend on the deferred shares. The Company now possesses forty-four estates in various parts of the metropolis, on which 5,388 dwellings have been built for occupation by about 27,000 persons of the working classes, and 104 are in course of erection and completion. The expenditure on capital account has now reached 1,061,991*l.*



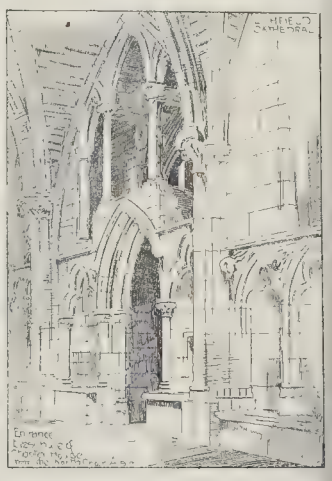
Illustrations.

LICHFIELD CATHEDRAL.

THE early history of Lichfield, like that of most of our cathedrals, is considerably mixed up with legendary lore, vague accounts of massacres, and the wonderful occurrences surrounding the life of the Patron Saint. The later history of the See has been so full of detail and memorable occurrences that this earlier history is, perhaps more than is usually the case, placed in the background. Its very position, in the centre of England, and in the midst of one of the principal fields on which the Civil Wars were fought, rendered it more liable to mutilation than probably any other cathedral in the country; the fact that its close was a fortified one, made its cathedral an object of attack; and, lastly, the merciless treatment it received from the Parliamentary soldiers in the first place, and from Wyatt in later times by "restoration," filled to the full its cup of misfortunes. The purely historical matter is outside the limits of the present article, except where it bears directly on the building itself. The Cathedral, as we see it to-day, and of which we give a large view from the north-west, a plan, and sketches, is the result of many years of patient labour and skill devoted to its restoration, and the result must, as a whole, be pronounced to be highly satisfactory. Dealing, in the first place, with the plan, we find a simple and straightforward scheme of design. A nave of eight bays with aisles and two western towers, transepts with eastern aisles, a choir of eight bays with aisles, and Lady Chapel at the east end, the Chapter House on the north, approached by a vestibule, and on the south an ancient sacristy all these, as will be seen on reference to the plan, make up a very symmetrical whole.

The gradual growth of the building is a point of interest, both in itself and as an example to compare with the growth of other buildings coeval with it. In 1860 the Cathedral was undergoing a thorough restoration by the late Sir G. G. Scott, and in the course of the alterations and the sweeping away of Wyatt's excrescences, the foundations of the early buildings were discovered, and at that time carefully plotted. A paper, by Professor Willis, read before the Archæological Institute in 1861, gives the result of the exploration. We are also able, by the kindness of Mr. St. John Hope, F.S.A., to give a series of plans showing the gradual growth of the eastern arm of the church. This should also be taken in conjunction with the larger plan of the whole building, on which has been shown the relative position which the early bears to the present structure. The only portion of the Norman building the date of which is uncertain, is the choir or presbytery, with its semi-circular apse. (See Plan I. and the general plan.) The lines of the choir of this early church, which probably extended to about 90 ft. westward of the present central tower, seems to have been followed in later times, although some of the buildings of intermediate date show deflexions south. The first growth, a small one, was a rectangular chapel extending beyond the Norman apse for a distance of 38 ft., and with a slight inclination to the south. (See Plan I.) The next change was of a very complete character, involving the destruction of the superstructure of Norman times, and substituting an Early English choir. This thirteenth-century building, which is the first which appears above ground in the cathedral as it stands at present, was apparently planned to enclose the early church, the inner face of its walls almost abutting on the outer face of the earlier ones. It extended also further eastward, and had a square termination. The plan No. 2 shows what the form and dimensions of this church in all probability were, and also the future extension which, like the Norman Church, it underwent, an extension of two bays further to the eastward, giving four altars across its eastern wall. Of this eastern wall considerable traces exist under the present pavement, and are shown (slightly hatched) on the larger ground-plan, passing under the seventh north and south piers of the present presbytery. It will also be noticed that this late extension deviated from the straight line of the first design,—it had, as the Norman addition had, a slight inclination southward. The deflexion is also to some extent visible at present in a mass of masonry outside the second buttress (counting from the eastward) of the south aisle, which is evidently a portion of the footing or plinth of this earlier building. At this period, too, a sacristy was built on the south side of the choir, and an additional room on its west side, which may have been a depository for valuables. Both of these also remain.

During the same century the re-construction of the transepts and the building of the beautiful Chapter House* and its vestibule took place, and before the end of the century the nave and a portion, at all events, of the west front had probably been built. It will be seen that the nave, although at right-angles with the transepts, is not in line with the choir. It seems probable that, as the Early English choir followed pretty closely the line of the Norman choir, so the transepts and the nave did likewise, and the divergence from the straight line, whatever its meaning, was in accordance with that of the earlier church. The extent of the deviation of the centre line of the choir from that of the nave is 5 ft. at the east



end of the Lady Chapel, a distance of nearly 200 ft. from the centre of the eastern arch of the central tower. The Chapter House and its vestibule follow the line of the choir, and are not parallel with the transept, and the same applies to the before-mentioned sacristy on the south.

We now come to the last and, to some extent, the most important change in the building. Walter de Langton became bishop in 1296, and like Beckington, at Wells, was a great benefactor as well as builder to his city and church.

The Lady Chapel, as we see above, was commenced by him, and formed the beginning of

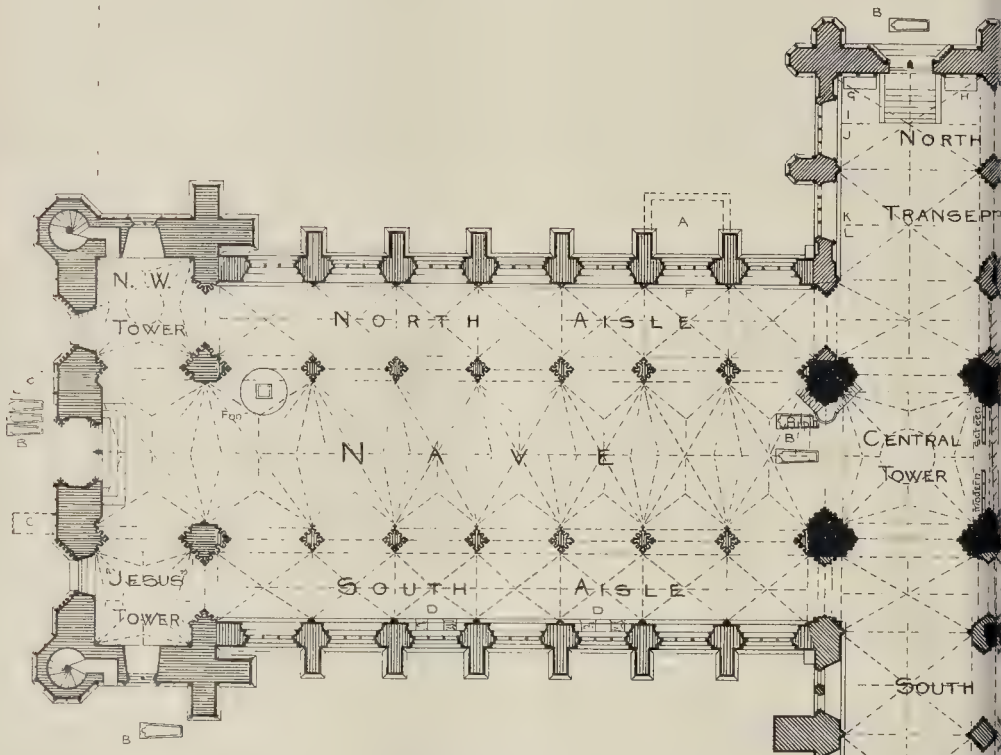
* The Chapter House is of two stories, the upper one, approached by a circular stair at the south-west angle, being used as a library

LICHFIELD CATHEDRAL.

GROUND PLAN.

Scale 5 10 20 30 40 50 60 70 80 90 100 FEET.

370 Feet.



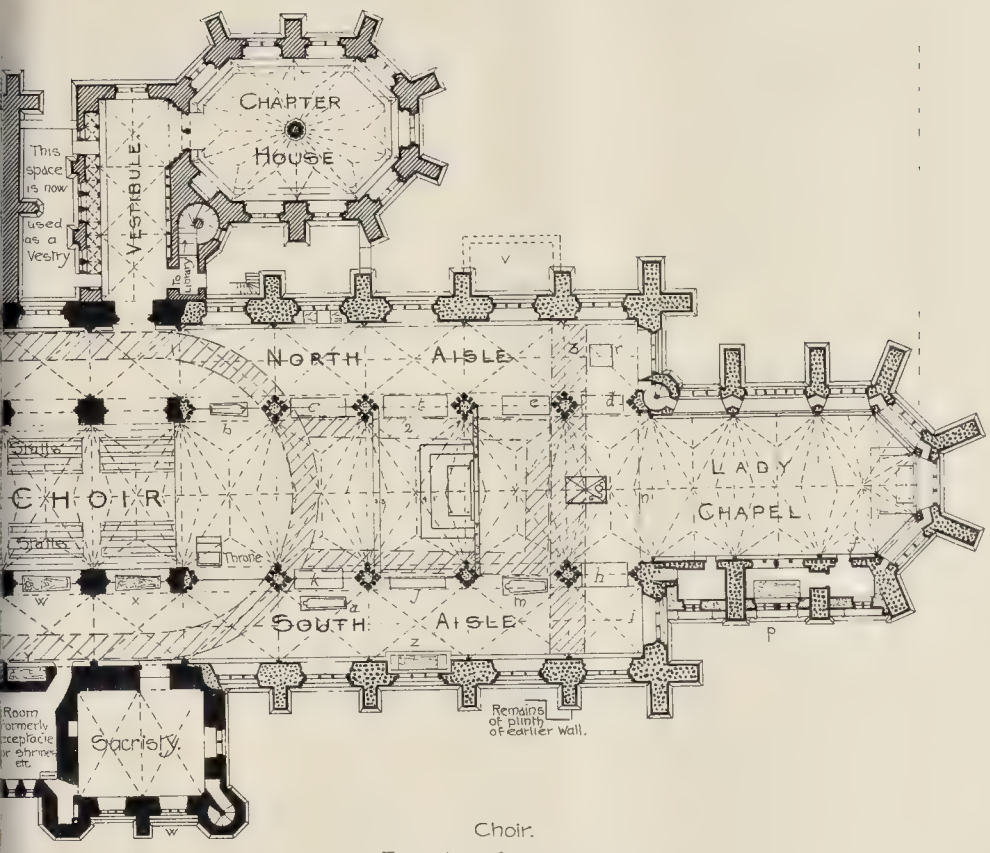
Nave. & Transepts

A. Remains of Dean Yorton's Chapel (A.D.1512).
B. Coffins discovered.
C C. Foundations of intended buttresses.
D.D. Semi-Effigies in Wall.
E. Ancient monument outside Transept.
F. Site of Monument of Dean Casey (A.D.1337).
G. Effigy of Dean Heywood (A.D.1492).
H. Monument
I. Mon[t] Mrs. Mary Madan (1827)
J. " Gen[l] Rich[d] Vyse (1825)
K. " Sir Chas. Oakley, Bart. (1826)
L. " Catherine Buckeridge (1787. Westmacott, sculptor).
M. Organ (now occupies whole of Aisle).
N. Bust of Dr Johnston (1784. Westmacott sculptor)
O. Mon[t] Bishop Cornwallis (1824).
P. Bust of Garrick (1799. Westmacott sculptor).
R. Mon[t] Andrew Newton Esq. (1806).
S. Officers 80[th] Reg[t] Staffordshire Volunteers (1791)
T. Mon[t] Bishop Smallbroke (1749)
U. Dean Howard (1868)
Here First stood Mar of Bishop Langton & secondly Mar of Bishop Hackett 1670 whose remains still rest below

Approximate Dates:

Choir 1200
S. Transept 1220
N. Transept 1240
Chapter Ho.

Note The portions hatched in Choir shew (1) The foundations of the & (3) The Transverse Wall which fo



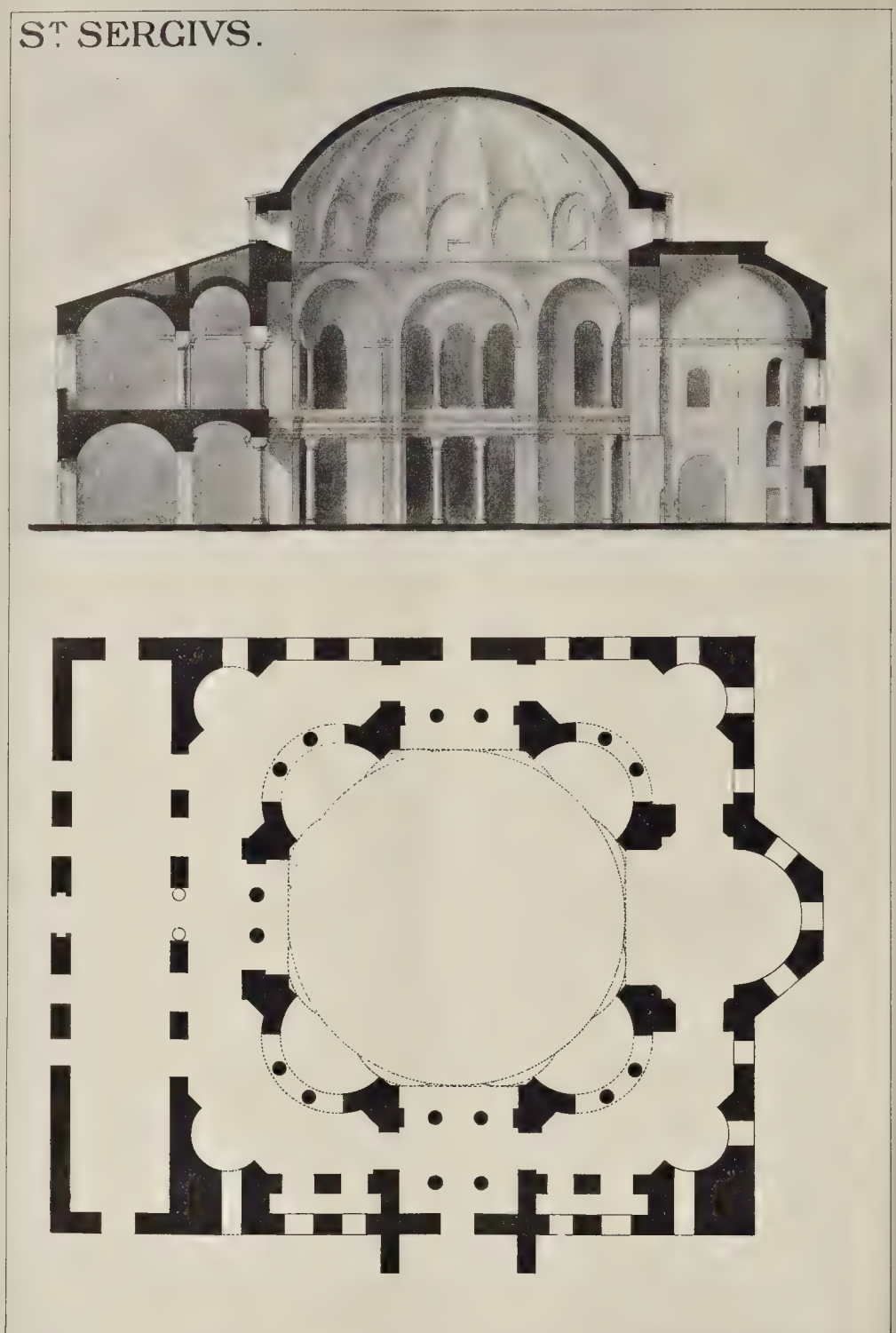
Choir.

V. Traditional site of interment of two Saxon Kings
w. Effigy of Bishop Langton
x. " " Bishop Patteshull (1243)
Y. Mon^{t} & Remains of Sir John Stanley of Pipe (1515)
z Mon^{t}. of Bishop Hackett (removed here c. 1787). Here stood Mon^{t} of Dean Heywood)
d Site of stone coffin of Adam de Stanford, Precentor, (1278.)
b. Coffin found 1856
c Probable site of Mon^{t}. of Bishop Scrope (afterwards Archbishop of York). Beheaded 1405
d. Site of Mon^{t} of Bishop Stretton (1385).
e. Probable site of Mon^{t} of Bishop Blythe 1530
f. Site of Mon^{t} of Robt Master, Chancellor (1625) Destroyed during Civil Wars
g Site of Shrine of St Chad.
h. Site of Robert Lord Basset's Mon^{t} (1390). Described by Sir W. Scott as Marmion's
i. "Sleeping Children" Daus. of Canon Robinson (1812 & 1813) Sir F. Chantrey 1817
j. Site of Bishop Langton's Mon^{t} (1322)
k Probable Site of Mon^{t} of Bishop Longespee or Meulan or Meylan (1296)
m Bishop Wm de Cornhull (d. 1223).
n Site of Stone Screen. Destroyed during Civil Wars
p. Three 14th Century Mon^{ts}, restored 1879, in memory of Bishop Selwyn
r. Bishop Ryder d 1836 (Sir F. Chantrey sculptor).
s. Major Hodson 1858 (G. E Street R.A.).
t Bishop Lonsdale 1866 (Sir G.G. Scott RA. Effigy by Watts)
u. Archdeacon Hodson 1855 (G.E Street R.A. Earp Sculptor)
w Ancient Mon^{t} outside Sacristy (15th Century)

Richard W. Paul Hons 1st Arch^{t}
Jany 1891

PHOTO L THO SPRAGUE & Co 22 MARTINS LANE CANNON ST LONDON

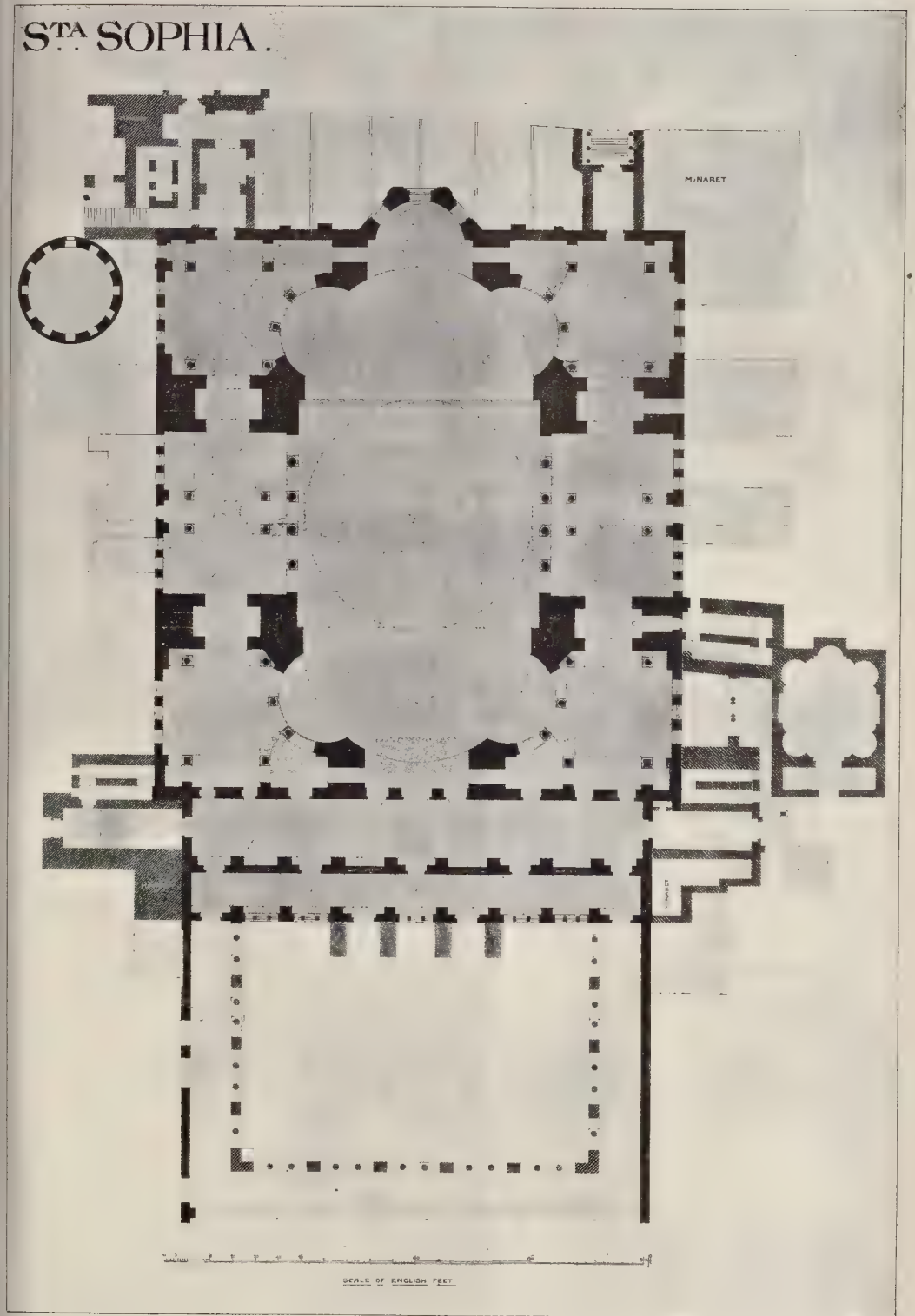
ry thus ////
ll's of Chapel afterwards added
f Early English building.



BYZANTINE ARCHITECTURE:

ILLUSTRATIONS TO PROFESSOR AITCHISON'S ROYAL ACADEMY LECTURES. LECTURE II.

SECTION AND PLAN OF ST. SERGIUS, CONSTANTINOPLE.



BYZANTINE ARCHITECTURE:

ILLUSTRATIONS TO PROFESSOR AITCHISON'S ROYAL ACADEMY LECTURES LECTURE II.

PLAN OF STA. SOPHIA, CONSTANTINOPLE.

STA SOPHIA

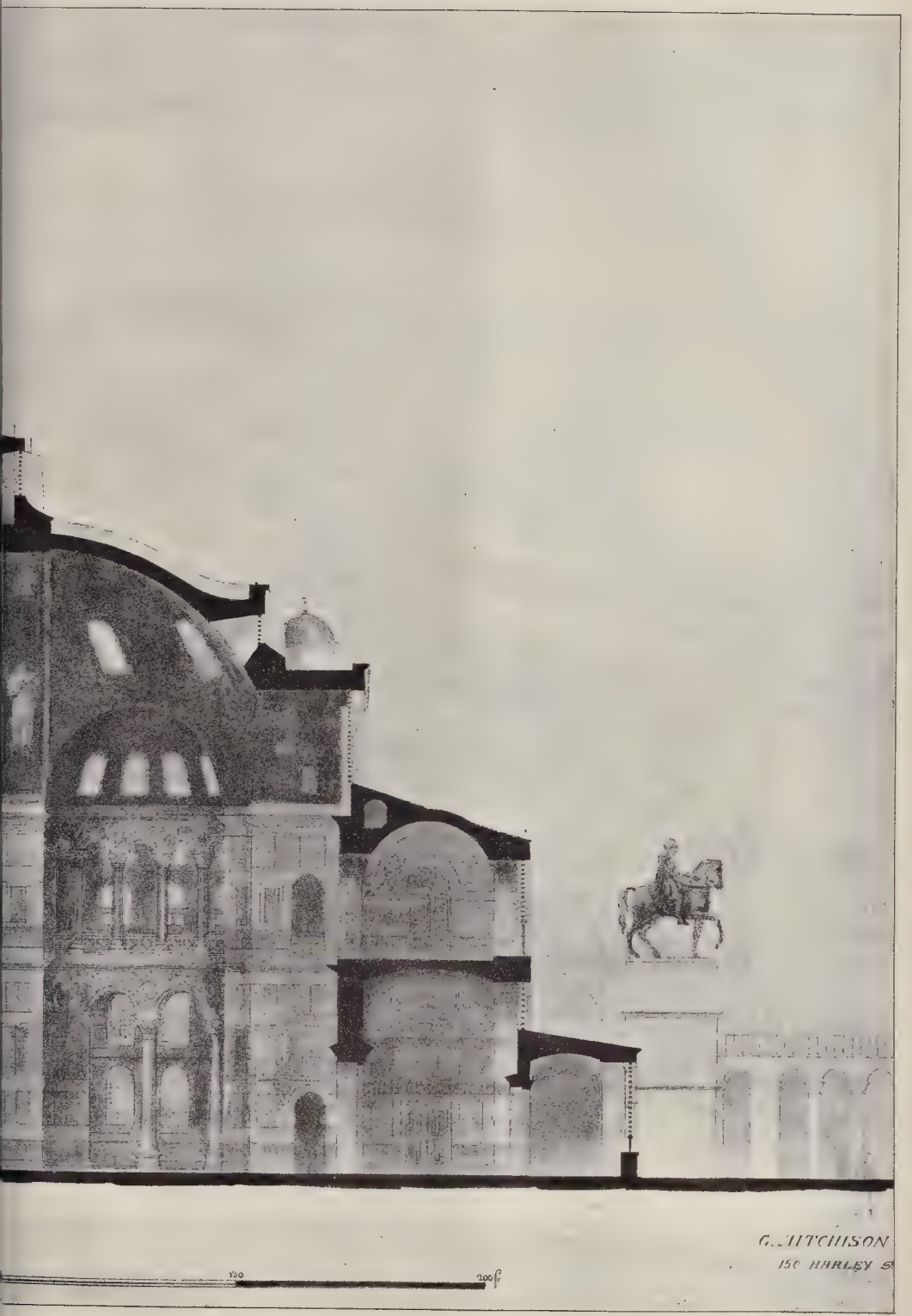


SECTION E. to W.

BYZANTINE

ILLUSTRATIONS TO PROFESSOR AITCHIS

SECTION OF STA S



G. JITCHISON
150 HARLEY ST

100 200 ft

N.B. PHOTO SPRAGUE & Co 22 MARTINS LNE CANNON ST LONDON E.C

ÉCTURE:

ACADEMY LECTURES. LECTURE II

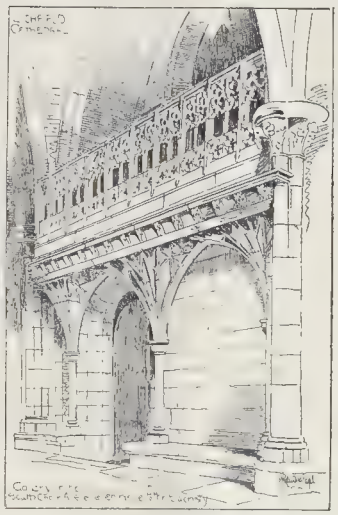
ANTINOPLE.

the remodelling of the Presbytery. The "feretrum," or shrine of St. Chad, was made at a cost of 2,000*l*, and placed immediately east of the great reredos (see g. on general plan), in a corresponding position to those at St. Albans and Westminster. Langton's successor, Roger de Norburgh (1322-1359), carried on the scheme of rebuilding westward, by finishing the Lady Chapel (for which money had been left by Langton), pulling down the Early English work as far as the third bay eastward of central tower and rebuilding the Presbytery, making the eastern arm of the church of eight bays (exclusive of the Lady Chapel) instead of seven as before (see plan 3 and general plan). The central gable of the west front and the two western steeples were Norburgh's work. Only the south-west or Jesus steeple remains, however, in its original state, the north-west tower above the cills of the belfry windows having been rebuilt in Perpendicular times in imitation of the earlier work. The height of this tower is not so great as the "Jesus" steeple by nearly 2 ft., and the spire is also shorter. The central spire was rebuilt by Bishop Hacket (1661-9), to whose energy is due the restoration of the Cathedral after its spoliation during the Civil Wars.

Of the ancient fittings of the Cathedral as it stood in the fifteenth century not a vestige remains. In 1643 the close, protected by a wall and ditch, was garrisoned for the King, and during the next three years it underwent three sieges, being finally surrendered to the Parliamentary forces on July 10, 1646. In 1643 the pillage took place. A clean sweep was made of the ornaments of the church, and the records were destroyed; the brasses were taken from their slabs, and the main structure itself had suffered severely by the destruction of the central spire, and damages from the fire that had been kept up on it during the siege. Of what little might have remained down to the period of Wyatt's restoration, or "improvements" as they were at that time called, we have to-day but two or three monuments left; two early effigies, one said to be that of Bishop Langton, who was buried first in the Lady Chapel and afterwards removed to where Bishop Hacket's monument now stands, and the other supposed to be Bishop Patteshull (1243). They are now behind the choir stalls under two arches of the south arcade (w and x

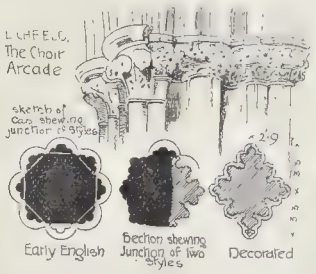


on plan) and are both of Purbeck marble. There is also a sixteenth-century monument opposite in the south wall to Sir John Stanley, of Pipe (1515) with an effigy under a canopy, and at one or two points in the nave and choir (see plan) a remarkable type of monument consisting of two recesses in the wall, resembling aumbries in size, containing the head and feet of an effigy. Three fourteenth-century monuments between the buttresses on the south side of the Lady Chapel have been restored as a memorial to Bishop Selwyn, whose effigy is placed in the central chapel. An interesting effigy of an archdeacon also remains under what was a rich Decorated canopy, outside the south end of the east aisle of the south transept. Traces of the Chapel of Dean Yotton are still to be seen outside the wall of the north nave aisle, where a four-centred arch with most delicate carving in the spandrils still remains,—now blocked up. Other special features of the building are the Chapter House, with its arcading and vestibule; the sacristy, on the south side of the choir, with a stone gallery projecting into the choir aisle



(said to have been for the exhibition of relics to the pilgrims on their way to the shrine of St. Chad); and the monument of Bishop Hacket, formerly in the south transept, and removed here about 1737, with some good heraldic work on the splay of the window, which is here deeper than the others. There is a broad double band of foliage on the splay of this window, which was probably inserted when Dean Heywood's monument occupied the site.

There is some curious work in the details of the early walls of the choir, and the treatment of the entrance to the vestibule from it on the north (see sketch). The junction of the two



dates occurs here both in the side walls and columns. The way in which the Early English column (an octagon of 5 ft. diameter surrounded by clusters of three engaged columns) was partially cut away and partially utilised in the new work is interesting. The plinth was kept, and the forms of the later clustered shaft were evidently designed with some regard to the earlier work. On the east faces of the arches at the west end of the choir aisles, is some Early work with chevron ornament (of similar character to the well-known work at Wells and Glastonbury), and probably one of the earliest pieces of work in the building.

The recent restoration under the late Sir G. G. Scott was really begun in 1856, but it was not until 1858 that the choir was handed over to be dealt with in a more extensive form. Wyatt's work has happily been effaced, a modern reredos has been erected on the site of the old one, and new stalls, a metal screen, and a metal pulpit have been provided. The organ, formerly over the choir screen, a composition partly in cement, by Wyatt, has now been removed to, and occupies the greater part of, the aisle of the north transept. Tiles, taken in a large number of cases from the old examples found, have been laid down in the choir, and there has been gradually springing up around the new altar a group of modern monuments to the memory of various dignitaries connected with the Church at Lichfield.* It is to be hoped that, when funds are procurable, a screen will be placed across the entrance to the Lady Chapel. It would vastly improve the interior which suffers, if in anything, from a lack of "mystery," besides being a restoration in some form of what originally was intended, and which actually did exist until the Civil Wars. Reverting to the plan once more, it is believed that this is the first time which it has been published to a large scale. All the chief dimensions have been checked and plotted on the spot, the sacristy has been reduced from drawings made during the restoration, and much information has been obtained as to the position of coffins and monuments from an excellent plan made by Mr. J. T. Irvine, to whom we are indebted for other information concerning the fabric. The plans showing the gradual enlargement of the Presbytery were made by Mr. St. John Hope, F.S.A., and Mr. Irvine, and have been kindly placed at our disposal for reproduction by the former gentleman.

The general view from the north-west, by Mr. W. H. Bidlake, shows the west front filled with its sculpture, the latest portion of the restoration, and which once more brings it back to something like its original beauty.†

BYZANTINE ARCHITECTURE.

THE plan and section of Sta. Sophia, at Constantinople, and those of St. Sergius, given in this number, form a portion of the illustrations to Professor Aitchison's second Royal Academy lecture, printed on previous pages.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE seventh ordinary meeting of this Institute for the present session was held on Monday evening last, at 9, Conduit-street, Mr. Alfred Waterhouse, R.A. (President), in the chair.

Obituary.

Mr. W. H. White (Secretary) announced the decease of Mr. Richard A. Hill, of St. Leonard's-on-Sea, Fellow; and also of Friedrich Baron von Schmidt, Hon. Corresponding Member, Vienna, and Royal Gold Medallist of the Institute.

The President said that they must all lament the death of their distinguished Corresponding Member, Baron von Schmidt, who had died at the early age of sixty-six. The Baron was full of honours, and was loved and respected by every one who knew him and came into contact with him, as he (the speaker) had the happiness of doing at Milan during the competition for the west front of the cathedral, when the Baron's wonderful judgment and exuberant vitality gave him a foremost place amongst the jurors. He had never had the opportunity of seeing the Baron's great work—the Town Hall at Vienna; but some of his earlier works, and especially his churches, showed a wonderful originality and much artistic grace. He thought they must all feel that not only the Institute, but Europe, had lost one of its most distinguished architects in the Baron von Schmidt.

The Royal Gold Medal for 1891.

The President: I have an announcement to make with reference to the Royal Gold Medal, and will call on the Secretary to read the By-law which affects it.

The Secretary having read the By-law,

The President said: The Council propose to submit to Her Majesty the Queen the name of

* By an error the monument of Archdeacon Moore, d. 1876, has been omitted on the plan. It stands in the next bay west of Bishop Hacket's monument in the south aisle

† We may mention here that the first of this series of illustrations of the Cathedrals of England and Wales, viz., Canterbury, appeared in the *Builder* for January 3. The third of the series (viz., St. Albans,—before the recent alterations), will appear in our number for March 7. Other cathedrals will be illustrated in the first numbers of succeeding months.

Sir Arthur W. Blomfield, A.R.A., as the recipient of the Gold Medal for the current year for his works as an architect. (This announcement was received with considerable applause.)

The School of Bramante, and its Expansion throughout Italy and the rest of Europe.

The President said he rose with more than ordinary pleasure to introduce Baron Henry de Geymüller, who had come all the way from Paris to read a paper on Bramante. Some among them would be glad to know—and he himself among the number—that the Baron was going to address them in their native language, though the four great European languages were equally familiar to the Baron, who could address them just as easily in one language as in another. Those who had made themselves familiar with the works that the Baron had with so much courtesy presented to the Institute Library knew that very well, as well as his sympathies and the depth of his knowledge. He was ashamed to say that he had not read one of the Baron's principal works—the life of the great French family of architects of the seventeenth century—the Du Cerceau; but he was told that it read like a novel. Then there were the Baron's Treatise on the Baths of Diocletian and Agrippa, on the Parthenon and Samothrace, and, above all, he would commend to their notice the work on St. Peter's. He would also like to remind the members that he believed the guest of the evening had said of English architects that they were the only architects who continued to use the tower,—or to build towers—in civil buildings. It was a curious fact, and he believed it to be a true one.

Baron Henry de Geymüller then read his paper bearing the above title. Before beginning the description of Bramante's career, and of the influence he exercised, the author indicated the place occupied by him in the architecture of the Renaissance in Italy. The development of that style might be considered to be due, above all, to the genius of four successive great masters,—Brunellesco, Leon Baptista Alberti, Bramante, and Palladio. The first created Tuscan or Florentine Renaissance; Alberti gave it a more Roman and general character; while in the hands of Bramante that style attained its complete and most perfect development, and had been made by him not only to be an *Italian* style, but a style as to its decorative principles capable of being universal. Palladio in several respects had been one of the propagators of Bramante's last manner, previously little known.

Bramante was born in 1444, at Fermignano, near Urbino, the son of peasants. The only precise facts that could be ascertained of the first twenty-eight or thirty years of his life were that while studying painting, as well as architecture, he had for masters Piero della Francesca and Andrea Mantegna, the first men of that time, not only as painters, but as masters in perspective. For masters in architecture he had Luciano da Laurana, the principal architect of the ducal palace at Urbino, and the master whose style in some measure most resembled that of Bramante; and Leon Baptista Alberti, who, as well as for the buildings erected from his designs, was famous for being the first modern writer on architecture.

The author then followed Bramante to Lombardy, where he might possibly have been led in consequence of the relations existing between the families of the Dukes of Urbino and those of Milan, and where he was to reside as one of the ducal painters and engineers. This title was also possessed by Leonardo da Vinci, with whom Bramante lived side by side for about eighteen years. The two references to Bramante's name in the writings of Leonardo, as well as the character of both those great men, permitted one to believe that their personal relations were rather cordial.

The author then mentioned the principal buildings which could be attributed to Bramante, pointing out in them those parts which were of importance for the history of Bramante's style, as well as that of the Renaissance. At Milan these buildings were the Church of S. Maria presso San Satiro, often, but erroneously, attributed to a pretended elder Bramante, or Bramantino da Milano, who never existed, but who obtained his imaginary birth from a confusion made by Vasari between some of the works of Bramante da Urbino and those of one of his pupils, the Milanese Bartolomeo Suardi, called Bramantino. Other notable buildings of Bramante were the façade of a church at Abbiate Grasso, begun 1477, and the lower half of the Rennaissance part in St. Maria delle Grazie, famous for the Cenacolo of Leonardo da Vinci in its refectory. The author believed that a door and three windows, executed about 1491, at the Como Cathedral, though never attributed to Bramante, ought to be assigned to him. After mentioning the Canonica di S. Ambrogio, Baron de Geymüller referred to the complete list of all the buildings erected, or merely begun, by Bramante which he had already published some ten years ago, and proceeded to show, by a letter from the Duke of Milan to his Ambassadors at Florence and Rome, that Bramante was expected to be in the latter town in 1493, no doubt for the planning of the celebrated Palazzo della Cancelleria, begun in 1495 from his design. The downfall of Lodovico il Moro and the conquest of Milan by the French caused Bramante to settle at Rome in 1499 or 1500. In 1502 his famous circular Tempietto of S. Pietro in Montorio had been already finished, and was published by Palladio amongst the ancient monuments as the only modern edifice worthy to be compared with them. The author did not dwell long on the Palaces of the Cancelleria and Giraud, which were still existing, as they were the best-known monuments of Bramante, and those by which generally at present an idea of his style was formed. He showed, however, that this idea was very incomplete. From the study of the original designs, many fragments of which he had been fortunate enough to discover, he derived the true features of those buildings of Bramante which either were only begun, or so altered as to render them unrecognisable. He himself thus understood that the reproach of tameness, or a want of apparent strength in the Orders which decorated those palaces, sometimes made against Bramante, was more true in appearance than in reality, and in no wise applicable to the whole of Bramante's style. He showed also that those buildings which by the principal writers of the sixteenth century were considered to have caused a revolution in architecture, and to be the beginning of the new style, formed precisely what he called Bramante's *ultima maniera*, or—Anglicised—"last manner." Of all these monuments that caused Bramante to be considered even by Michelangelo as the greatest architect that lived since those of Ancient Rome, one single one, the Tempietto of S. Pietro in Montorio, though incomplete, was standing. It was so small in size that, as a mere chapel, it could give no idea of the whole style, which could only be derived either from a close study of the monuments and their alterations, or from the fragments of the original designs that had come to light, although not always in a sufficient number. The principal monuments of this last manner were St. Peter's at Rome, the restoration of the Vatican palace, the new Court of Law in the Via Giulia, probably Raphael's own palace, and the Santa Casa at Loreto.

Having already published in fac-simile the greater part of Bramante's studies for St. Peter's that he had hitherto been able to discover, the author did not describe fully this mighty work, which he considered would have been, if erected according to Bramante's design, not only the largest, but also the most beautiful temple ever erected, uniting in it the glorious beauties of antique art, as well as some of the solemn impressions and aspirations of the Gothic style. He was convinced, after twenty-five years' study of this matter, that neither at Athens nor at ancient Rome, nor ever since, had any architect equalled the harmony and grandeur of that *ensemble*, with its cupola rising above a Greek cross (not a Latin one, as so often printed on an incomplete examination of Serlio's erroneous information), and accompanied with two, if not four, mighty towers at the extremities of the square base. The original designs showed how incomplete and erroneous was the principal information hitherto possessed on that subject, as, for instance, the belief that Bramante's piers were too weak, and inclosed in existing ones as a kernel in its fruit.

Some of the principal features of Bramante's style, and particularly of his last manner, were then described by the author, who was of opinion that the influence of those celebrated designs and models of Bramante had been immense and immediate on older as well as younger masters. The designs for St. Peter's influenced some elements in the numerous studies of Michelangelo and Giuliano da Sangallo in the competition of 1516 for a new façade of St. Lorenzo at Florence. Bramante had for draughtsmen, at the "fabric" of St. Peter's, Peruzzi, Antonio da Sangallo the younger, and many others, while Raphael d'Urbino had been his favourite pupil and successor. Both the Sansovinos had been employed by him, and all distinguished architects of Italy at Rome became acquainted with his designs and models. Thus they had reproduced in their own buildings at Genoa, Verona, and Venice parts of these designs and models which hitherto were believed to belong to their own invention.

The death of Raphael, of Leo X., and the sack of Rome were events which contributed to disperse his pupils over Italy; whilst French architects went to Rome, where they became acquainted with the followers of Bramante's last manner, as well as with the designs and models of the master himself. This was the case with Flemish as well as with Spanish and German artists, and thus the forms of the new style gradually spread over Europe. In numerous cases parts of their works reflect ideas taken from the designs of Bramante for the Vatican, St. Peter's, and other works. In this way Palladio, too, for whom the author professed an admiration equal to that exhibited in England, very often had become the propagator of ideas and forms belonging to Bramante in his last manner.

In conclusion, some of the characteristics of Bramante's art were described, the aim of which the author considered to have been, in the highest sense of the word, perfection. Bramante had had the fortune of having for masters the greatest artists then alive. Adding to the knowledge thus obtained that derived from nature by his study of proportions in the human body as well as that of the horse, on which subjects he wrote treatises now lost, Bramante became the most learned and scientific architect of his time. He always knew exactly for what reason he used a form. But he was also the one most endowed with the personal gift of creating that beauty which cannot be taught, and which the author designated "Beauty by the grace of God."

Thus the works of Bramante were (1) the result of all that science and knowledge of proportion teach; and (2 of the personal power of Bramante of creating beauty to a degree unsurpassed by any master before or after him, and extending as well to the majestic and powerful composition of the whole, as to the most lovely and minute detail of his ever-charming ornaments. In Bramante, after more than a thousand years of efforts in Italy, a perfect harmony was obtained between the southern and the northern elements expressing laws of universal truth, and sufficiently, too, the legitimate freedom of personal individuality.

A few words were added by the author on some of the methods by which architects at that time obtained their professional training.

Professor Kerr, on the conclusion of the paper, moved a vote of thanks to the Baron. At the present moment, he said, they in England were drifting, as an end, towards that state of things from which the Italians, of whom the Baron spoke so pleasantly, made their beginning. What he meant was that they were trending towards the reign of the universality of art. That principle had not been recognised in this country for ages, but it was now beginning to be recognised,—the idea that all art was one art, and all equally dignified and useful to the human race. Some of the leading architects of this country were now distinguishing themselves as designers of what a few years ago would have been considered as inferior subjects, and the treatment of which would have been left entirely to the manipulation of what were supposed to be inferior designers. At the period which they had been accustomed to call the revival of arts and letters in Italy, it was remarkable that almost all the architects were either painters, sculptors, or designers of some artistic matter; that was what we were now arriving at, but it was the point from which the Italians had started. Bramante might be taken as the leader of the great movement, which was now being perceived to be no sham,—the great movement constituted by the revival of Roman architecture on Roman ground. Mediæval or Teutonic architecture, as distinguished from the Latin, never took a hold on Italian ground to any great extent. When the Mediæval system of society had passed through a long course of decadence, it was necessary that something

new should be introduced as the basis of the new scheme. That referred to the whole intellect of man, architecture being always a very readable index of the position of intellect at the moment. It was necessary, especially in an ambitious age, that architecture should arise and reign, not only through the ordinary means of buildings constantly in need, but there was a desire to erect great monumental structures, which should be commensurate in dignity with the aspirations of the period, which were of a very exalted nature. Now, what were these artists, being universal artists, to do? It was said that they ought to have proceeded on something which was their own, and not to have taken that which belonged to the Romans. What did Bramante do, as a typical man? Bramante, it was said, devoted himself more earnestly than others to the study of the Roman remains with regard to their details. Roman architecture left off at the Colosseum. It might be said that it was bad architecture, but the Colosseum was the ultimate manifestation of the original Roman Classic orders, seen in the superficiation of a great building rather than as parts of the mere construction of the temples out of which these orders sprang. Therefore, when Bramante and others had to create a new architecture, where were they to go but to the Colosseum? The Gothic architecture, which was now going out of fashion, did not reach Italy with any force, and the Italians began exactly where their predecessors on Italian ground had left off. Thus it was that the Italian Renaissance style began; it was no sham, but a genuine modern European style. It sprang into existence from the careful manipulation of such men as Bramante, and acquired a strength which had carried it forward to the present day, and which would do so for generations to come. He would add one word as to the lesson to be learnt from the attitude of such men as Bramante. The Baron, perhaps, had heard of the "Queen Anne" style, so called, which, whatever its defects, had the merit of being the stepping-stone from their very admirable revived Gothic to the new revival of modern Classic. And what he thought they might advise young students to do was to follow Bramante by studying the old remains,—not the Gothic remains, for that had been well done,—but the Italian monumental buildings, and above all things the mouldings, as Bramante did. The mouldings of the "Queen Anne" style were abominable, but those of the coming style would be as sweet and admirable as they were on the soil of France.

Col. Lenox Prendergast (Hon. Associate), in seconding the vote of thanks, said the paper was on a subject in which he took the greatest possible interest. He thought that Baron de Geymüller had done them great service in reading his paper. He scarcely liked to follow in the wake of the words which had fallen from the mover of the resolution, because he had not the position occupied by Professor Kerr, giving him the right of criticising what was done in this country by the profession. At the same time, he ventured to think, if there ever was a moment in which it behoved those who had gone through various styles in connexion with their studies, to revert to the period which had been so eloquently described by the Baron, it was the time present. He did not express this as merely his own opinion, but as that of a late lamented Fellow of the Institute—the great historian of architecture—Mr. James Fergusson,—who, in his book on modern styles, urged upon them that that course was the one by which salvation was to be found. They had now come to this position in England, that there was a positive thirst for adequate Italian architecture. In everybody's house they would see the details they were longing for—of course, mixed up with a great many vulgarities of the "plush" period which was going on.

Professor Baldwin Brown expressed the pleasure he had in having the opportunity of making the acquaintance of Baron de Geymüller in person, most of them having known him from his books for a long time past. The most important work of Bramante was the design for the new St. Peter's, which the writer of the paper had spoken of as one of the noblest ever evolved from the brain of an architect, and which would have produced one of the greatest buildings in the world. It was not a little interesting that the same idea of plan, that of the Greek Cross and central dome, was before the mind of Sir Christopher Wren when he was designing St. Paul's Cathedral in London. Unfortunately in both cases, that plan was not carried out, and it still remained for an architect of the nineteenth century to carry out on a colossal scale a cathedral on that plan.

Mr. H. H. Statham said that Baron de Geymüller had referred to the very remarkable engraving, after Bramante, in the British Museum. It was a magnificent engraving, and was well worth a visit, as it seemed to sum up the whole spirit and peculiarity of Bramante's architecture. There were three other small engravings there, which he hoped were genuine, and which were marked Bramante in the catalogue. They were about 18 in. by 12 in., and were of very remarkable interest, as showing a quality in Bramante of which there was no evidence in the illustrations before them. They represented an architectural composition consisting of two parallelograms placed parallel, and in the middle a triumphal arch connecting them. Their peculiarity was in their being designed so that the mass of the two sides should be the same; the cornices being the same height. At the same time, they were treated absolutely diversely in every other respect. On the left hand was a building with a simple order of columns and entablature and the same repeated above. On the other side there was a building, of which the ground story was a round-arched arcade, above which there was an entablature treated quite differently, with a highly-decorated frieze. Above that, again, there was no order but the plain wall with windows, a plain attic above with round windows, and the final cornice again ranging with that on the other side. He hoped that Baron de Geymüller would not tell him that these drawings were spurious; but even if they were not Bramante's, they were remarkable instances of an attempt at that period to get rid of being bound down to symmetry in classical building. They were an attempt to treat a classic building with variety, the two sides balancing in mass, and yet being diverse in treatment, and any one interested in the subject would find it worth while to look at them. There was another remark he would like to make as to the light which had been thrown on the building of St. Peter's by Baron de Geymüller's book. They had heard it often said that the architects of the period were firstly painters and sculptors, one effect being that they were rather afraid of what they had to do in architecture. This was remarkably brought out by the illustrations, in the Baron's book, of St. Peter's at the various periods of its building. There they saw three or four great arches standing up in the air, with nothing to connect them, no one knowing apparently how to go on. It struck him that that gave one a new insight as to the tentative way in which the builders were then trying to do the work, and it was interesting to look at that book, and get the idea of the real way in which the building of St. Peter's was carried on.

Mr. Arthur Cates said he was disposed to consider Bramante as having greatly influenced the English school of Italian architecture. To Bramante, Sir William Chambers and the architects of his school may have been greatly indebted, and the Baron's observations could not have come at a happier time, as Professor Kerr had said, in calling attention to the careful study of details and to the manner in which Bramante devoted himself to such studies of detail which, unfortunately, had been too much neglected in this country by students. The Baron had referred to the stay of Bramante in Milan. Now, in Milan there was a remarkable church, which probably was known to most of those present, but which he believed Bramante never saw in its present condition. It was the Church of San Lorenzo, of which a considerable portion came to grief in the early part of the sixteenth century. That church, however, was built upon the foundations and plans of the Central Hall of the Great Baths of *Maximinianus Herculeus* about the year 250 of the Christian era, and there was in some respects a remarkable similiarity between the plan Bramante first sketched for St. Peter's,—the Greek cross,—and the church. He did not know whether the Baron had noticed that, and whether some of the first inspirations of Bramante might not have been derived from the study of the plan of the church before its restoration, which was carried out after the fall of the vaults. Probably, then, a good deal of the Roman work might have remained, and it might have been a more perfect monument than they saw it now. There were certain peculiarities in the plan of arrangement which led him to think that it was not improbable, in Bramante's study of the ancient monuments, as he went to Rome, his ideas and aspirations were first started by what he had seen of the Roman remains in Milan and other places, it was not unlikely, therefore, that in his first sketch for St. Peter's there appeared this Roman idea, which was given him by the Church of San Lorenzo.

The President, in putting the vote of thanks, said it had struck him, in what had been said of Bramante's many wonderful qualities,—his love of study and the way in which he studied the ancient examples,—that nothing had been said of another remarkable quality possessed by him, namely, his extraordinary readiness. Bramante was always ready when the opportunity presented itself to him, and when he had the opportunity of doing a great work, he prepared a design on the spot. He thus astonished his clients,—Popes or otherwise,—by designing the work that they wanted in a very short space of time. Now, that readiness and extraordinary industry was brought about in a large measure by the way in which he had improved his opportunities in youth, by studying the works of the ancients.

The vote of thanks was carried by acclamation.

Baron de Geymüller, in reply, said that if he had succeeded in imparting to any young member of the Institute a love for Bramante, he should not have come there in vain. As to the engravings Mr. Statham had referred to at the British Museum, he had not seen them, but he supposed they were the same as those in the Print-room in Paris, on which he read a small note. As to San Lorenzo, he was pleased to hear Mr. Cates allude to it, because there was one of the sketches for St. Peter's, in which there was a plan which undoubtedly appeared to be a fragment of the plan of San Lorenzo.

The President then announced that the next meeting would be held on Monday the 16th inst., and the proceedings terminated.

THE SURVEYORS' INSTITUTION:

STUDENTS' PRELIMINARY EXAMINATION.

OF the candidates who presented themselves at the preliminary examination of the Institution, held concurrently in London and Manchester on the 21st and 22nd ult., the following satisfied the examiners:—

Aldis, William H.	Lancaster, John R.
Andrews, Walter E.	Little, Henry
Barton, Harold	Liversedge, John W.
Bidwell, Philip S.	Marriage, Percy J.
Brinsley, Herbert G. W.	Martin, Samuel
Burder, Reginald E. C.	Morris, William H.
Buss, Septimus	Moxon, Harold
Chattell, David G.	Nanson, Laurence
Child, Charles, jun.	Neighbour, Charles E.
Christian, Percy	Nicholls, Edward A.
Davidson, Richard B.	Nicholson, Arthur W.
Dinwiddy, Donald	Norris, Arthur B.
Eadie, James J.	Pain, George L.
Eason, Edward W.*	Parker, Frederick W.
Everington, John	Roberts, Joseph W. G.
Farmer, Hugh Cecil	Sheppard, Alex. C. O.
Gayford, Herbert H.	Sly, Joseph T.
Gipps, George R.	Speke, Charles
Graiton, Wykeham C. J.	Stenning, Oswald F.
Hales, Arthur J.	Stevens, Sydney S.
Hawes, Frederick K.	Strouts, Lewis H.
Heasler, Holland C.	Tewson, Leonard
Hendry, Alfred	Thompson, Frederick H.
Hodges, Walter	Townsend, William
Holmes, John E.	Turnbull, William G.
Jenkinson, John	Watts, Rupert C.
Jones, Percy E.	Weatherhead, David W.
Keep, John P.	Williams, Henry C.
Kidman, Edward H.	Windsor, Arthur S.
Knight, George E.	Wyatt, Archibald

* Passed at head of List.

OLD NORWICH.—The February number of the *English Illustrated Magazine* contains an interesting article on Norwich by Mr. R. Owen Allsop, with sketches of old buildings drawn by Mr. C. O. Murray.

THE ASSESSMENT OF THE CITY OF LONDON.—Some interesting figures (says the *City Press*) are to be noted in connexion with the recent quinquennial assessment of the City. It appears that in all upwards of 15,000 separate properties had to be dealt with by the Assessment Committee of the City of London Union. The gross valuation, as finally determined upon, is 4,834,545*l.*, the net rateable value being 4,092,139*l.* The gross value in 1866 was 2,202,045*l.*, so that within the space of twenty-five years the valuation of the "one square mile" has more than doubled. Worked out, the valuation shows that the City is assessed at about 8,000*l.* an acre.

NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

The annual meeting of this Association was held in Birmingham on Wednesday, the 28th ult. The President, Mr. J. H. Colls, occupied the chair, and was supported by Messrs. J. C. White, S. G. Bird, R. Neill, jun., J. S. Jones, hon. treasurer, C. W. Green, auditor, with the following members of the Council:—Messrs. Wm. Moulson, A. Krauss, Wm. Southern, T. F. Rider, Wm. Sapcote, John Bowen, Jos. Henry Marsden, C. Tomkinson, Alex. G. White, R. Beevers, W. Houldsworth, and in addition thereto representatives were present from London, Manchester, Liverpool, Bradford, Bristol, Birmingham, Bolton, Hull, the Potteries, Stalybridge, Kidderminster, Stoke-upon-Trent, Tunstall, Hanley, Plymouth, Northwich, Preston, Walsall, Newport (Mon.), Derby, and Truro.

The half-yearly report, read by the Secretary, after giving details of the various trade movements for increased wages and shorter hours in various parts of the country, went on to say that the officers and Council of the Association would continue to watch the Employers' Liability (Amendment) Bill in the course of its progress through Parliament, and proceeded:—

"The Council deem it their duty to the members of this Association to keep them reminded of the steadily increasing risks to which they are exposed by the working, under experience, of even the Liability Act at present in force, irrespective of the new one threatened. It is manifest that damages are more and more frequently awarded to injured workmen by the County Courts, even in cases of extremely doubtful liability, under the strict interpretation of the Act as it stands. Employers of labour may at any time be seriously mulcted in damages though no real default of their own—the only safeguard being insurance, of which all provident men should avail themselves, seeing that a serious accident might ruin a man in fairly good circumstances at any time. Every facility for insuring against all such risks is now afforded—first, by the Builders' Accident Insurance Company, started as an offshoot of this Association by members of its trades for mutual protection and assistance; second, it offers all possible security at the lowest rates consistent with such security."

The Chairman, in moving the adoption of the report, congratulated the members on the considerable accession of local Associations to the general Association. The masters had no wish to keep wages down if the men were justified in asking for more. With respect to labour movements, he would advise the masters to insist that they should meet the representatives not only of the unionist men, but of non-union men where practicable. With respect to the Employers' Liability (Amendment) Act, they would be glad to hear that the Association would continue to give it their attention. He wished the masters could hope for some relief from the hardships which they suffered already, but there seemed only the prospect of further hardships being thrust upon them. That was the tendency of the age, and he was afraid they could not fight against it.

Mr. J. C. White (Liverpool) seconded, and the resolution was adopted.

Mr. J. S. Jones (Liverpool), the hon. treasurer, submitted his audited accounts, which were duly approved and passed.

Mr. J. Bowden moved a resolution to the effect that a committee be appointed to confer with the general associations of the operatives with a view to establishing a general code of working rules for each branch of the trade, with the exception of rates of wages and hours of work.

Mr. J. Bowen seconded, but the general view of the meeting was that such a Board could not be got to work together, and on a vote being taken the proposal was defeated by a large majority.

Mr. J. C. White (Liverpool) was elected President for the ensuing year; Messrs. Robert Dennett, Nottingham (re-elected), and J. Bowen (Birmingham), Vice-Presidents; Messrs. S. G. Bird (London), W. H. Cowlin (Bristol), Robert Neill, jun. (Manchester), and J. H. Colls (London), Honorary Vice-Presidents; Mr. J. S. Jones (Liverpool), Honorary Treasurer; and Mr. W. C. Green (Liverpool), Honorary Auditor.

It was resolved that the next place of meeting should be Cambridge.

Mr. Bowen afterwards conducted the members over the New Law Courts, for the erection of which he is the contractor.

In the evening the members were entertained by the Birmingham Master Builders' Association at a banquet, Mr. C. H. Barnsley presiding.

THE INSTITUTE OF BUILDERS (INCORPORATED).

The seventh annual general meeting of the Institute of Builders was held at the offices, 31 and 32, Bedford-street, London, W.C., on Tuesday, the 3rd inst. Mr. Thomas F. Rider, F.R.G.S., the President, occupied the chair, and the Secretary, Mr. Richard S. Henshaw, read the following report of the Council for the past year, viz.:—

"1. The Council have the pleasure to present their Seventh Annual Report to the Members of the Institute.

2. The question of altering the Articles of Association in such a manner as to allow of Past-Presidents becoming Honorary Vice-Presidents and *ex-officio* Members of the Council (so long as they continue Members of the Institute), mentioned in the last Report, was referred to the Council for further consideration, and a general meeting of the Members was held on November 4, 1890, when the necessary alterations, as drafted by the solicitor, were unanimously approved, and a subsequent confirmatory meeting on December 4, 1890, having been held, the necessary alterations have been made, and Mr. Stanley G. Bird, Mr. J. Howard Colls, Mr. Geo. Burt, and Mr. Frank May, —the first four Presidents of the Institute,—have thus become honorary Vice-Presidents, with a seat at the Council.

3. In the early part of the year the Council received from the Royal Institute of British Architects, the draft of proposed 'General Conditions of Contract,' which they suggest should take the place of those formally agreed between the Royal Institue of British Architects and the old 'Builders' Society.' The Council have appointed a Committee to go fully into the subject, who have held twelve meetings, and whose report it is expected will shortly be received.

4. The Council have during the past year been in correspondence with the Master Builders' Association of Boston, U.S.A., with reference to framing By-laws for that city, as well as with the National Association of Builders of America, whose friendly sentiments they desire heartily to reciprocate.

5. The advice of the Council was sought by the Building Act Committee of the London County Council, as to what improvement (if any) might be made in the duties and appointment of District Surveyors, and having given the matter careful consideration, a reply was sent embodying the views of the Council on the subject, of which a copy was sent to each Member; but the recommendations made (like those from other cognate societies whose opinion was asked), did not meet with the approval of the present Governing Body of London.

6. Several Bills were introduced into Parliament during the year, the principal of which was the 'Employers' Liability (Amendment and Consolidation) Bill.' Nothing has been done in the House of Commons in reference to this during the present Session, but notice of an amending Bill has been given, and on its being proceeded with it will receive the full attention of the Council.

7. In conformity with the announcement 'contained in the last Report the Council elected Robert Childerhouse to the Institute of Builders' Pension in the Builders' Benevolent Institution.

8. In addition to the usual grants from the Benevolent Fund to the Builders' Benevolent Institution, the Builders' Clerks' Benevolent Institution, and the Provident Institution of Builders' Foremen and Clerks of works, the Council have also had the pleasure of rendering some assistance to three private applicants.

9. In accordance with the Articles of Association, the President, Mr. T. F. Rider; one of the Vice-Presidents, Mr. R. J. Waller; the Treasurer, Mr. G. Plucknett; one or the Auditors, Mr. G. Burt, jun.; and four Members of the Council -Mr. John M. Burt, Mr. W. H. Clarke, Mr. Woodman Hill, Mr. R. Neill, jun.,—retire, but are eligible for re-election; and in consequence of Messrs. Bird, Colls, and May becoming by virtue of their Past-Presidentship Honorary Vice-Presidents, the Members are called upon to elect three additional Members of the Council."

On the motion of the Chairman, the report was received and adopted, and Mr. H. T. Ashby was unanimously elected President for the ensuing year. Mr. F. J. Dove and Mr. Robert Neill, jun. (Manchester), were elected Vice-Presidents; Mr. George Plucknett, J.P., was re-elected Treasurer; Mr. J. M. Burt, D.L., Mr. W. H. Clarke, and Mr. Woodman Hill were re-elected, and Messrs. Basil P. Ellis, Joseph Hill, J. Hunter Jones, Wm. Shepherd and Joseph C. White (Liverpool), were elected on the Council; Mr. Geo. Burt, jun., being re-elected one of the auditors.

A vote of thanks to Mr. Thomas F. Rider for his services as President during the past year concluded the proceedings.

New Town Hall, Saltcoats.—Some time ago, in answer to an invitation, seventeen designs were sent in by architects for the proposed new Town-hall, Saltcoats, N.B. After consideration, the Commissioners (says the *Glasgow Herald*) were not satisfied with any one of the plans, and appointed a committee to endeavour to put into shape the views expressed in consultation. The committee prepared a pencil-sketch of the hall in accordance with the views expressed by the Commissioners. This sketch has been approved of, subject to such alterations as might appear advisable afterwards. The Commissioners agreed to invite architects who had sent in plans to state on what terms they would be willing to prepare complete plans for the new hall, taking the pencil-sketch as a basis.

ARCHITECTURAL SOCIETIES.

Birmingham Architectural Association.—At a meeting of this Association, held on 27th ult., the question of better art training for architectural students was the subject of a discussion, which was opened by Mr. E. R. Taylor, the Head Master of the School of Art. Mr. Taylor laid down as points on which all were agreed that the present pupilage system is a good one, but that it needs supplementing; and that an architect must be an artist. From this Mr. Taylor argued that the artistic education of an architect was of the greatest importance, and that it should be wide and sound, and that as it was his artistic abilities which would alone distinguish him from the engineer and builder. No pupil should be articled until he had given proof of his possession of such abilities, and that for this some part of the elementary educational course and examination should precede the pupilage. Mr. Taylor discussed at considerable length the Examination scheme of the Royal Institute of British Architects, and of the Architectural Association's (London) education scheme, and pointed out that in both too little emphasis was laid on the artistic part of the profession.* He then gave in detail a scheme for the art education of architects, divided into elementary and advanced parts, and embracing study in freehand and model drawing, geometry, colour, design, proportion, modelling, light and shade, and the history of art, and pointed out the way in which such a scheme could be carried out at the School of Art at the same time that the Architectural Association classes gave the technical education required to supplement the office routine work.—Among those who took part in the discussion were Sir T. Martineau, who, as a member of the Committee of the School of Art, said he should welcome any scheme which brought the School and the profession more closely together.—Mr. T. Naden, President of the Architectural Association, said that his experience had proved the value of the School of Art training to be very great, and that he hoped Mr. Taylor's remarks would reach the Council of the Royal Institute of British Architects.—Mr. H. R. Lloyd proposed that, in order to give practical effect to Mr. Taylor's valuable suggestion, they should be submitted to a committee for careful consideration, and after some comments from Mr. W. Hawley-Lloyd (Vice-President), and from Mr. Newton and Mr. Freeman Smith, and others, this course was agreed to, and a hearty vote of thanks was accorded to Mr. E. R. Taylor for his able paper.

Liverpool Architectural Society.—On the 2nd inst. at the Royal Institution, Colquitt-street, Liverpool, Mr. E. P. Warren, of London, read a paper dealing with the "History of the Hearth." The lecturer strongly condemned some of the modern constructed chimney-pieces, which lacked architectural beauty both in design and execution. Chimney-pieces were, he declared, universally singled out for attractive treatment in nearly every household; and yet in many cases the advantages they afforded for such were dreadfully misused. Mr. Warren's remarks were illustrated with numerous sketches and photographs taken in Italy, France, Belgium, and also in this country. Mr. T. M. Reade, the President of the Society, occupied the chair. A vote of thanks was passed to Mr. Warren at the close of his lecture.

Manchester Architectural Association.—At the ordinary meeting of this Association, held at the Diocesan Buildings on Tuesday last, Mr. T. Chadwick, President, in the chair, Mr. H. Ross, A.R.I.B.A., read a paper on "Houses for Working Men," a subject which he treated in a most exhaustive manner. A vote of thanks to the reader, proposed by Mr. Hodgson, and carried, concluded the proceedings.

Cardiff Architects' Society.—The first lecture this session, under the auspices of the Cardiff Architects' Society, was held at the Town-hall, Cardiff, on the 30th ult. The Rev. C. J. Thompson, M.A., presided, and there was a good attendance to hear Mr. H. D. Searles-Wood, F.R.I.B.A. (of the Architectural Association, London) lecture on "An Architectural Tour in Italy." The lecturer described the principal architectural features of Milan, Verona, Placenza, Bologna, Florence, Siena, Orvieto, Pisa, and Rome, and illustrated his subject by

* Perhaps Mr. Taylor will explain how he proposes to test artistic capabilities by an examination.—Ed.

a large number of admirable photographs. At the close of the lecture Mr. J. P. Seddon, F.R.I.B.A., moved a vote of thanks to the lecturer, and Mr. E. Seward, F.R.I.B.A., in seconding, said it was the intention of the members of this newly-formed society to have lectures at intervals which would be interesting to the public as well as to the members. The resolution was carried unanimously, and a vote of thanks to the chairman concluded the proceedings.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At the usual fortnightly meeting of this Association, held on the 29th ult., Mr. John Kinross presiding, a paper was read by Mr. Thomas F. Binnie, valuator, the subject being "Are architects and builders adversely affected by present system of feu-duties and taxation?" In the course of his remarks he said (according to the *Scotsman*) that if unfeued lands suitable for feuing, and in demand, were taxed at an annual value similar to the price demanded by the landlord, the latter would not be so anxious to hold for exorbitant prices. After pointing out that the landlord contracted himself out of the paying of rates, Mr. Binnie stated that over and above that injustice they found duplicands and triplicands of feu-duty universal, while the taxing of singular successors, under the name of casualties, was carried on in a way that quite justified the term legal robbery. This system bore more directly, if not more heavily, upon the architectural profession and its ally the building trade than upon any other industry. Mr. Binnie thought some such action as the following might help to remedy the evil of the land monopoly:—1. The total abolition of casualties and duplications, triplications, &c. 2. The placing of the incidence of taxation beyond the sphere of contract, so as to make it impossible for the superior to shirk his duties to the State by contracting himself out of them. 3. The taxing of unfeued lands, contiguous to feued lands, at the same annual value, taking the price of feus last sold as the standard of value for the remainder. This would prevent the holding of lands for exorbitant prices without cost to the holder. 4. Existing contracts to run as at present till ownership changes, either by the death of the superior or by sale, and upon the registration of the change of ownership, let them come under the operation of the new law. 5. In cases where the superiority of lands is held by corporations, the superiors be allowed to enjoy the contracts as they stand for, say, fifteen years, and then let them come under the operation of the new law. Some such plan, he proceeded, would have a tendency to cheapen land, it would make taxation fall more fairly upon the various classes of the community, and would remove the temptation to hold lands long after their occupation was made necessary by the expansion of our cities for the purpose of forcing unreasonable terms upon the citizens.

ARCHITECTURAL SECTION OF THE PHILOSOPHICAL SOCIETY OF GLASGOW.—A meeting of the architectural section of the Glasgow Philosophical Society was held on the 2nd inst., Mr. James Thomson, President, in the chair. Mr. Francis H. Newbery, head master of the Glasgow School of Art, read a paper on "The Artist in the Architect." He reviewed the history of architecture with the object of showing that the architect of the past was not only greater than the painter or the sculptor, but that he often combined both. This was because his training in no wise differed from that of the others. Painting and sculpture had had, and still were having, constant recourse to nature, whereas architecture confined herself to tradition. Gothic architecture, he said, almost broke through this, but was restrained by Classic bias. When architecture could command votaries whose efforts had assimilated a knowledge of the figure as possessed by the Greeks, with an insight into floral ornament such as the Gothic builders had, then there would be evolved a new style of work. The study of the human figure ought to be the backbone of the architectural student's work, instead of as at present the copying of traditional forms and elements.

TRADE SMOKING CONCERT.—The Mutual Cycling Club (in connexion with Messrs. Colls & Sons' office staff) gave a smoking concert at the Surrey Masonic Hall on the 29th ult. The chair was occupied by Mr. W. A. Colls, who was supported by Mr. Ellis Marsland, Mr. W. Matthews, Mr. E. Brooks, and a large number of gentlemen connected with the building trade.

ARCHÆOLOGICAL SOCIETIES.

THE LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.—On the 30th ult. the annual meeting of this Society was held in Chetham's College, Manchester, Mr. W. E. A. Axon presiding. The annual report of the Council was read. It stated that the Society had completed its eighth year, and in every year there had been a steady increase in the roll of members. At the end of last year there was a total membership of 337. The motion for the adoption of the report having been agreed to, the election of officers for the year took place, with the following result:—President, Sir William Cunliffe Brooks, Bart., F.S.A.; Vice-Presidents, Mr. William E. A. Axon, F.R.S.L., and Principal Ward, M.A.; treasurer, Mr. T. Letherbrow; honorary secretary, Mr. G. C. Yates, F.S.A.

NEWCASTLE SOCIETY OF ANTIQUARIES.—The seventy-eighth anniversary meeting of the Newcastle Society of Antiquaries was held on the 28th ult. in the Castle, Newcastle, the Rev. Dr. Bruce presiding. The annual report of the society for 1890 was submitted, in which reference was made to the death of two of the society's oldest members, Mr. John Clayton and Mr. C. Roach Smith. Mr. Clayton's successor, it was stated, was about to build a museum at the Chesters, in which the abundant Roman remains would be more satisfactorily housed, and a full catalogue of the contents of the museum was in course of preparation. The report was adopted. Dr. Hodgkin said, with regard to the proposed publication of the "History of Northumberland," they had issued circulars and had received a good many responses, but not sufficient to enable them to go forward with publication.

Correspondence.

To the Editor of THE BUILDER.

ADJOINING OWNERS.

SIR,—Your able article on "Adjoining Owners under the Metropolitan Buildings Act," in your issue of January 31, must have been read with great interest by all architects, especially those who have to deal with, and work under, the provisions of the said Act almost daily.

In the course of my profession, I had to deal with the party-wall which was, later on, the subject of the action of "Fillingham *v.* Wood," but surely, to the practising architect, the decision of Mr. Justice Chitty opens no new ground! I have for years, when about to deal with a party-wall, carefully ascertained who are the adjoining owners in such wall, whose term is more than a yearly tenancy, and upon each and every one of these I have served a party-wall notice. Often in the case of a party-wall in the City of London, where the adjoining premises are let out in offices, this leads to a large amount of labour and expense (in one case lately, five notices were served with regard to the same wall).

I think, however, it is only just that a tenant, who holds "part of a tenement," even for three years only, should be allowed a voice in what may mean the laying open and re-building of the part of the premises in which he is interested.

My difficulty and objection in having to serve so many party-wall notices is in the next step, viz., the making of awards with several different adjoining owners. This I always try to avoid, if possible, by getting all of them to appoint the same surveyor to act for them, but if they were hostile to such a course, or their interests clashed, and they would not so act, I think the building owner might be under the necessity of making an award with each one separately, an expensive and by no means easy task.

An expression, however, upon this important point from your readers would be of much interest, and practically most useful.—Yours faithfully,

HOWARD CHATFEILD CLARKE.

63, *Bishopsgate-street, Within, E.C.*, Feb. 2, 1891.

SURVEYORSHIPS.

READING.—For the vacancy in the Borough Surveyorship, Reading, caused by the resignation of Mr. A. W. Parry, sixty-one candidates applied. The committee of selection chose from this number Mr. Martin (Bradford), Mr. Paton (Birkenhead), Mr. Collins (Weston-super-Mare), and Mr. Greenhill (Cardiff), who appeared before a committee of the Reading Council on the 28th ult. After a careful investigation, a vote was taken, the result being as follows:—Collins 16, Paton 10, Martin 7. As Mr. Collins had not a majority of the Council, another division was necessary, and this resulted in the election of Mr. Collins.

The Student's Column.

VENTILATION AND WARMING.—VI.

DOMESTIC VENTILATION.

IT is a matter of every-day experience that a considerable amount of fresh air enters the majority of rooms through the imperfect fitting of windows and doors, especially when exposed to the direct action of the wind. Nevertheless, the results of careful experiments to determine the precise amount of such ventilation are unfortunately lacking.

Such direct observations would be of especial value, because a theoretical investigation can only take account of recognised probabilities, and must, therefore, be deficient in data drawn from experience, the want of which must be supplied by inferential reasoning. Our inferences may possibly be somewhat erroneous, but in default of accurate observation, we must rely upon the assistance that theoretical calculation can afford.

In considering the subject theoretically, we can regard the open joints of any particular door or window as channels or means of communication between the external and internal air. The dimensions of these channels, of course, vary in each instance with respect to their size and arrangement, and the rate of flow will vary with the difference of pressure of the external and internal atmospheres, modified by the friction of the sides of the channels, which will naturally be comparatively of considerable amount, owing to the high proportion which the periphery of the cross section bears to its area. We can further regard the difference of air-pressure due to the difference of the internal and external atmospheres, and also due to external wind-pressure; and, ascertaining the extent of these for any particular instance, we can make our calculations based upon these data, just as we can make any other calculations for the flow of air from an atmosphere of greater pressure to one of lesser intensity.

A considerable proportion of the ventilation caused by our open fireplaces has, undoubtedly, as its fresh-air inlet, the imperfect joints of doors and windows. This, from the rapidity of the current, as well as the inevitable lowness of external temperature, which, of course, co-exists with the use of a fire, lead to the production of draughts. Very much of the draught thus produced may be avoided by adopting some of the precantions we have noted in a previous chapter to this particular case.

By enlarging the collective area of our inlets, we at once diminish the rapidity of current; by subdividing them, we break up the current; and by giving an upward direction, we divert it from inconvenient proximity to our persons.

Various expedients have been suggested and adopted to attain these ends. Thus, for example, the well-known device adapted to double-hung sashes of a shallow board fixed between the beads at the bottom of the lower sash. Then the lower sash being raised, a considerable opening is formed between the meeting rails and a smaller one between the bottom rail and the shallow board. Through these the air enters at a slow rate, and with an upward direction, so that not only is the ventilation improved by the reduction of frictional surface, but draught is lessened by decrease in the rapidity of current of the incoming fresh air.

Of a similar nature are Currall's ventilators, made for insertion into the rail of a sash or of a door. Various forms of inlet boxes for building into a wall have also been introduced for the same purpose, which have the further advantage that means of filtering the incoming air, a very necessary consideration in dealing with the atmosphere of a smoky town, can be readily combined.

These and similar expedients are, perhaps, the best that can ordinarily be introduced for the ventilation of domestic buildings, wherein, by reason of the initial expense and the difficulty of maintenance of artificial ventilation, save of the simplest form, we are usually limited to some form of natural ventilation, despite its manifold disadvantages.

We have already referred to the operation of an open fire as contributing to ventilation. The creation of a considerable column of heated air in the flue is, of course, accompanied by a movement of air, from the difference of atmospheric pressure within the flue and without the building. Tested with an anemometer, we ordinarily find the rate of flow within the flue to vary from 3 ft. to 6 ft. per second. The multiplication of these figures by the sectional area of the flue,

gives us at once the cubical amount of ventilation which is being effected.

Taking the ordinary size of a flue at 14 in. by 9 in., it will be at once seen that the amount of ventilation thus produced is not great, and even when assisted by diffusion through the enclosing walls, ceilings, and floors, sufficient only for ordinary cases, in the absence of artificial lighting, other than the electric light.

When the rooms of a dwelling-house are fully occupied, as in the case of a dinner-party or an "at home," or when the rooms are lit up by the ordinary gas-burners, further ventilation than that afforded by the fireplace is necessary.

The best method of effecting this extra ventilation will vary with circumstances. It is as absolutely impossible to prescribe one particular method or "system" of ventilation which shall be applicable to all cases as to prescribe one particular drug which shall prove an infallible panacea for all bodily ailments. Such a procedure as this in medicine is now generally recognised as sheer quackery. In ventilation it is equally sheer quackery to assert that any one "system" is always and infallibly the best.

To increase the extent of domestic ventilation, various forms of valve ventilators have been designed for insertion in chimney-flues. These are always liable to the possibility of smoke escaping into the room from them, and are, besides, of small efficiency in adding to the extent of the ventilation. They have this advantage, that the foul heated air at the upper part of the room is carried off at a high level, instead of being brought down to the level of the fireplace opening, as would otherwise be the case. In this way, the apparent improvement they effect in the atmosphere of the room is caused, and, so far, their operation is valuable.

It is, however, far better to provide an extra flue for the insertion of such ventilators, and thus avoid the probability of leakage of smoke while, at the same time, providing additional outlet capacity.

The increase of temperature which invariably attends the vitiation of air by a larger number of occupants, and still more than of artificial lighting, furnish us with a means of air movement which, for domestic ventilation, is invaluable.

Frequently, the provision of an extra flue, carefully protected from reduction of temperature, together with corresponding additional inlets, carefully arranged to minimise the production of draught, will, by reason of the increased temperature of the vitiated air, be sufficient to largely augment the amount of ventilation.

Further activity of atmospheric change can easily be arranged for by warming the additional flue or flues, or by utilising any other reliable method of producing air movement. Sometimes water-power may be obtained to work a small fan, sometimes wind pressure may be utilised, sometimes some other source of power.

As a general rule, admitting, of course, of occasional exceptions, a central system of ventilation for domestic purposes is not advisable. The varied requirements of the room, the partial nature of their occupation, all combine to make individual arrangements for each far preferable and far more easily managed than a combined system with central action.

We have taken it for granted, in considering domestic ventilation, that a fire is burning in the room needing ventilation. At those periods of the year when a fire is not burning, undoubtedly the best method of producing ventilation in domestic buildings is to open the windows.

OBITUARY.

Mr. John Dixon, C.E.—On the 28th ult., Mr. John Dixon died at his residence, High Towers, East Croydon, aged 56. Mr. Dixon will be remembered as the engineer who undertook the transport of Cleopatra's Needle from Alexandria to the Thames in 1877. He was the nephew of the late John Dixon, the first chief engineer of the Stockton and Darlington Railway. He was born in Newcastle in 1835, says the *Newcastle Chronicle*, and after serving an apprenticeship at the Engine Works of Robert Stephenson & Co., he was appointed engineer and manager at the Bishopwearmouth Iron Works of the Consett Iron Company. He soon after removed to London, where he began a successful career as engineer and contractor, which was continued till his death. In this capacity he carried out many important works in various parts of the world, commencing with the landing stages on the Thames Embankment, piers at Southport and Douglas, Isle of Man, and large iron piers and wharves at Huelva, in Spain, for the Rio Tinto Company. A bridge over the Nile at Cairo was his next work, followed by extensive drainage and sanitary works at Rio Janeiro, and piers in Mexico and Para on the Amazon. About 1874, in connexion with Mr. Richard Rapier, he got the concession for, and made the first experimental railway in China, from Shanghai to Woosung. He also discovered an unexpected supply of water in the Rock of Gibraltar. His next enterprises were in Portugal, where he constructed the Custom House Piers at Lisbon, and a sixty-mile line of railway, for which he was awarded by the late King an Order of Merit. Bridges at Waterford in Ireland, and docks and harbour extensions at Port Talbot, in Wales, occupied him for some time, and almost his last important work was the re-building of Hammersmith Suspension Bridge over the Thames, for the Metropolitan Board of Works. Mr. Dixon was some years ago accorded by the University of Durham the degree of M.A. (*honoris causâ*). He was also a Lieutenant of the City of London. On the 2nd inst. his remains were interred at Shirley Church, near Croydon.

Herr Nikolaus Ybl.—The death is recorded, at Pest, of Nikolaus Ybl, the most eminent of Hungarian architects. The deceased was 77 years of age. He studied at Vienna, followed his profession for some time at Prague, and for the last fifty years resided at Pest, where he designed many remarkable buildings, amongst them being the Opera House, the Custom House, and the Karolyi Palace. His latest works were the completion of the Leopoldstadt Basilica, and the Castle of Ofen (Buda).

Mr. Henry Oldham.—On the 1st inst., Mr. Henry Oldham, contractor, of Accrington, and a member of the Town Council, died at the age of forty-four. He was extensively engaged in the building trade.

Mr. T. Wilkes Webb.—The death is announced of Mr. T. Wilkes Webb, of the firm of Thomas Webb & Sons, Limited, Dennis Works, which occurred somewhat unexpectedly on the 21st ult., at his residence, The Mount, Stourbridge. Mr. Webb was only fifty-four years of age; but he entered upon business early, and his connexion with the works at Dennis have extended over forty years. When he entered his father's office and works about the year 1850, the condition of affairs in the flint glass trade was very different from what it is now. The application of art to manufactures of all kinds in England was then in a very backward state, and this was as obvious in the glass industry as in any other. The firm of which,—before it became a limited company,—Mr. Webb was the ruling and guiding spirit, attained a high reputation for its artistic products, especially in cameo, engraved, and enamelled glass.

GENERAL BUILDING NEWS.

The New Admiralty Buildings.—We have had an opportunity of inspecting the foundation-works for the new Admiralty buildings in St. James's Park, close to the Spring-gardens entrance. The contract for the superstructure (for which Messrs. Leeming & Leeming are the architects) has not yet been entered into, so that all that is apparent inside the hoarding is a huge excavation, some 324 ft. long by 134 ft. wide (outside measurements), and averaging 17 ft. in depth. This deep cutting is now lined with a very massive concrete wall, 17 ft. 3 in. thick at the level of the lower bench or step, and gradually diminishing by successive steps or sets-off as it goes upwards, until it is about 4 ft. wide at the ground level. Upon the top of this concrete wall will rest the main external walls of the superstructure. The whole bottom of the area excavated is also being covered with a thick bed of concrete. The contractor for the whole of these works is Mr. William Webster. Much difficulty has been experienced with the water with which the subsoil here is heavily charged. To prevent it from penetrating the concrete work, the whole of the external faces of the retaining wall (*i.e.*, the faces against which the earth will abut) are covered with Claridge's asphalte, applied in pieces about 18 in. by 12 in., *à la* armour-plating, the joints being V-grooved and tongued, and filled in with liquid asphalte, so as to make one homogeneous whole of the protective asphalte coating, which is ¾-in. thick, and is connected with the asphalte damp-course which passes under the footings of the wall and under the whole of the basement area. It makes a very neat and effective job, and is an interesting exemplification of the capabilities of Claridge's asphalte.

The Royal English Opera House. — Mr. D'Oyly Carte's new theatre in Shaftesbury-avenue, of which we gave a few particulars last week (see p. 93, *ante*), was opened with *éclat* on Saturday evening last, with the new opera *Ivanhoe*, composed by Sir Arthur Sullivan. The acoustic properties of the building appear to be, by all accounts, satisfactory in all parts of the house. From want of space and other unavoidable causes we are obliged to hold over our promised detailed description of the building until next week.

Poor-Law Schools, Cannock.—The Cannock Board of Guardians have lately had completed a block of buildings to accommodate fifty boys and forty-eight girls, from plans, &c., prepared by Mr. J. R. Veall, of Wolverhampton, architect to the Board. The accommodation provides day-rooms and dining-hall for boys and girls, sewing-room, two bath-rooms and lavatories, with dormitories for ninety-eight children in single beds, all cheerfully lighted and well-ventilated. A Trainer's sitting and bed-room, scullery, stores, earth-closets, and other conveniences are also provided. The floor of the dining-hall and day-rooms are laid with the Wood Block Flooring Company's patent flooring; hot and cold water are laid on to the baths, lavatories, &c., and gas is fitted throughout the wards. Spacious playgrounds for each sex are provided with covered sheds, and latrines in each yard, which are laid with "Melsom's" tar and granite-chipping asphalte. The whole of the works have been carried out by Messrs. Dorso & Son, contractors, Cradley Heath, at a cost of 2,214*l.*, under the superintendence of the architect.

New Royal Assembly Hall, South Shields.—The new Royal Assembly Hall, South Shields, has just been finished. The building is situate in Stanhope-street, at the rear of the Royal Hotel, with which it is connected by covered bridges and corridors. The principal elevation is in the English Renaissance style of architecture. Normandy bricks and Hebburn stone dressings have been used in the exterior walls. An entrance-hall or crush-room forms the first apartment, and on either side are cloak-rooms. From the crush-room there are corridors leading to the reserved seats of the hall. The hall is 120 ft. long and 60 ft. wide. At the end nearest the entrance are the platform and orchestra. This part is covered with a domed ceiling, and artists' dressing-rooms are provided beneath the orchestra. A gallery is situated at the opposite end of the building. The total accommodation of the hall will be nearly 2,000 people. The ceiling is in the form of a barrel vault, intersected by semi-circular groins, springing from pilasters, and all the interior decorative work is executed in fibrous plaster by Mr. G. G. Laidler, of Newcastle. The flooring of the hall is laid with hard wood. On the basement of the premises there is another hall. The building has been lighted with electricity by Messrs. R. J. Charlton & Co., of Newcastle. Provision has also been made for gas-lighting; this, with the plumbing and sanitary work, having been done by Mr. John Dagleas, of South Shields. The building is heated by steam coils, fitted by Messrs. Dinning & Cooke, of Newcastle. Cathedral tinted glass has been used for glazing the windows, screens, and doors. Messrs. Middlemiss Brothers, of Newcastle, were the general contractors for the work, which was designed and carried out under the superintendence of Mr. J. H. Morton, architect, of South Shields.

Church, Kilsyth.—The plans of Mr. Petrie, Glasgow, have just been adopted for the proposed United Presbyterian Church, Kilsyth, N.B. The church will be seated to hold 658, with a large hall attached. The total cost of church, hall, and other offices is estimated at 2,500*l.*

New Church, Llandaff Yard.—On the 28th ult., the church of All Saints', Llandaff Yard, was consecrated by the Bishop of the Diocese. The church is designed in the fifteenth century style of architecture, and accommodates about 300 people. It consists of a nave, 51 ft. by 25 ft.; a choir, separated from the nave by a large open arch; and the chancel, also separated from the choir by an arch. The vestries and organ chamber are formed out of the quasi-transepts by open screens. A tower is formed at the south-west angle. The church is built of Pontypridd stone, with Bath stone dressings. The seats, roofs, screens, &c., are all of pitch pine, the lectern and altar being of oak. The pulpit is of coloured stone, with alabaster bands and a niche formed for a figure in front. The floors of the chancel and choir are laid with marble inlay in cement (patented by Mr. J. Hartnell, of Cardiff). The font is also of coloured stone. The centre light of the east window represents the Crucifixion, and the two east choir windows are filled with figures of St. John and St. Peter. These are by Messrs. Savell & Co., London. The work has been executed by Messrs. W. Thomas & Co., Cardiff, from designs and under the supervision of Messrs. Kempson & Fowler, architects, Llandaff.

Mathew Centenary Hall, Dublin.—A new Temperance Hall, erected in Church-street, Dublin, to the memory of Father Mathew and his work, has just been opened. The hall is 75 ft. in length by 39 ft., with a height from floor to ceiling of 35 ft. The ceiling is covered with pitch-pine framing. A gallery runs around two sides of the hall, and extends half way from the back to the centre of the hall. The front of the gallery is panelled. The stage is a large one, and underneath are dressing-rooms, with entrances from both sides of the building. At one side of the entrance is a coffee-bar, and over that a reading-room and a billiard-room. In the upper storey are the caretaker's rooms, as well as some store rooms. Under the hall there is a large space, which is to be fitted up as a temperance refreshment-room. The work has been carried out by Messrs. Kelly & Sons, of Dublin, from the designs of the architect, Mr.

Walter Doolin, Dublin, and under the supervision of Mr. Patrick Barry, the clerk of works.

PROPOSED NEW CHURCH, LIVERPOOL.—At a Consistory Court, presided over by Chancellor Espin, and held in St. Nicholas's Church, Liverpool, on the 27th ult., the Rev. Thomas Dickson, incumbent of Christ Church, Waterloo, and the churchwardens applied for a faculty authorising them to take down the old church and erect a new one on the same site. The new church would accommodate as many persons as the old. It was considered that the roof of the old church was insecure, and its reconstruction was deemed necessary. Permission was also asked to allow the church authorities to provide a temporary place for holding Divine service in by an addition to the north transept of the old church while the new church was being built. The cost of the work that was to be started at once would be 6,000*l.* After scrutinising plans and drawings connected with the new church, the faculty was decreed in the terms of the citation.

SANITARY AND ENGINEERING NEWS.

NEW BRIDGE AT PENSHER.—On the 29th ult. a new bridge over the Wear at Pensher was opened for public use by the Earl of Durham, Lord-Lieutenant of the county of Durham. The total cost of the bridge and approach roads is about 8,000*l.* Messrs. Head, Wrightson, & Co., Stockton-on-Tees, have been the contractors for the bridge structure, and Mr. John Carrick, of Durham, for the approach roads, Mr. L. Hudson, jun., Sunderland, being the sub-contractor for the masonry, piling, and bridge roadway. The engineer for the bridge works was Mr. D. Balfour, M.Inst.C.E., F.G.S., and the clerk of works Mr. W. T. Fowls. The foundations consist of concrete overlying a pitch pine double platform supported on 12 in. piles driven to the depth of 25 ft. under the river bed into the bard shale. The abutments are of large rock-faced ashlar, with main pillars 12 ft. high adjoining the approach parapet walls, the stone being supplied by the Whitburn Coal Co. from their Marsden Quarries, near South Shields. The iron structure consists of two curved main girders of wrought iron, each 155 ft. long, resting on large bed stones. Each girder has the upper and lower booms braced by vertical struts and diagonal ties, having three overhead lattice bracings for wind pressure. The flooring consists of cross girders 12 ft. apart, overlaid with longitudinal corrugated iron troughing, covered with a bed of concrete and a finished surface of whinstone, tar, and macadam, steam rolled. The net span of the bridge is 145 ft., and the clear width of the carriageway and approach footway is 22 ft., and the net height of the bridge above high water-mark is 20 ft., as required by the River Wear Commissioners.

PROPOSED SEA-WALL PROMENADE AT FILEY.—On the 27th ult., at the Local Board Offices, Filey, Mr. Arnold Taylor, Local Government Board Inspector, conducted an inquiry with respect to an application by the Filey Local Board for compulsory powers to acquire lands otherwise than by agreement for the construction of a proposed sea-wall promenade. Mr. Luke White (Driffield), the solicitor to the Local Board, said that that body some years ago contemplated the erection of a sea-wall at Filey, and that evidence was then given at a Local Government Board inquiry which was held, which showed that such a wall and promenade were absolutely necessary for the protection of property from the incursion of the sea.—Mr. W. N. Maley (chairman of the Filey Local Board) said that if the proposed works were not done, it would only be a question of how many years would elapse before the town, or at least the part of it in question, would be washed away entirely, and it was necessary that the land adjoining the proposed sea-wall promenade should be acquired for the purpose of laying it out as gardens, so as to increase the attractions of the town as a health and pleasure resort. The Inspector intimated that he would report the result of the inquiry to the Local Government Board.

FOREIGN AND COLONIAL.

FRANCE.—The Minister of Instruction and Fine Arts has presented to the town of Elbeuf a very interesting archæological collection containing some unpublished documents on the history of France, especially the records of the Abbey of Cluny and the Cathedral of Grenoble.——The jury in the competition for the monument to General Lariboisière at Fougères have awarded the execution of the work to M. G. Recipon (sculptor). The first premium has been given to M. Gilbert (sculptor), the second to MM. Desca and Meugin (sculptors), and M. Pierre Gélis-Didot (architect). Other medals and honorary mentions have been awarded to other competitors.——The jury in the competition for a Salle des Fêtes for the town of Séthune have given the first premium to M. Conil-Lacoste, the second to M. Courtois-Suffit, and the third to M. A. Agnès.——The sudden death, at Bordeaux, is announced of M. Durand, of that city, architect among other works of the Hot Baths establishment at Cauterets in the Pyrenees, and of the synagogue and the new building for the Facultés des Lettres et Sciences. He was born at Bordeaux in 1824. He joined in 1876 the Société Centrale, of which he was an active member.——The Government intends to commission M. Bonnat to execute the allegorical painting for the ceiling of the principal chamber of the Civil Tribunal at the Palais de Justice of Paris.——The Museum at Dijon is to be enlarged by the addition of three new sculpture galleries. There is also to be a gallery built for the collected works of Rude, the sculptor, which are at present dispersed in various parts of his native town.——The church at Ermont, which has been recently completed, is to have five decorative panels painted by M. Albert Maignan. The subjects are the Virgin and child and two angels, on the three centre panels. The other two panels will have floral decorations in mosaic.——The Municipal Council of Bagueux has decided to proceed with the restoration of the church there, which is classed under the "Monuments Historiques." It is a curious edifice dating from the twelfth and thirteenth centuries.——M. Debon has been commissioned to execute some decorative panels for the Mairie of Charenton-St.-Maurice, consisting of views in the suburbs of the city.——M. Galland has completed his paintings in the fifteen cupolas of the ceiling of the gallery running along the salons à arcades in the Hôtel de Ville at Paris. He has painted these with allegorical representations of the principal Paris trades. The gallery was to be opened to-day (February 7).——M. Chaplain has been commissioned to execute the marble bust of the Republic for the Lycée Buffon, recently built on the Boulevard de Grenelle from the designs of M. Vaudremer.

COLOGNE.—Last year the new bronze doors of the west entrance of the Cologne Cathedral were hung. The first bronze door of the south entrance has now been placed in position. This portal, like the others, has been designed by Professor H. Schneider, of Cassel. Considering their weight (1,500 kg.) and their height (4 mètres), the doors swing very easily, the wings having been hung on ball-bearing hinges. —*Deutsche Bauzeitung.*

DRESDEN.—The valuable collection of casts which has been found room for in the lately-finished "Albertinum" buildings has now been opened to the public. The arrangement of the Olympia groups deserves special attention.

WIESBADEN.—A new Court Theatre is to be erected at a cost of some 1,800 000 marks. The following architects, Professor Frentzen (of Aachen), Herr Semper (of Hamburg), and Messrs. Hellmer & Fellner (of Vienna), all theatre specialists, are to be invited to send in designs.

BERLIN.—At the official celebration of the Emperor's birthday at the Royal Technical College, the Rector for 1890-91, Professor Reuleaux, gave a lecture on the advance of German industry and the advantages of Berlin carrying out the proposed Universal Exhibition scheme so long spoken of. At the University celebration the archæologist, Professor Curtius, spoke on Hellenic art. At the Prussian Royal Academy the Emperor was honoured as a friend to the freedom of art in a commonplace patriotic harangue by Professor Dobbert.——The illuminations on the evening of the Emperor's birthday showed the advance electricity has made in the capital of late years. Large commercial establishments framed the architectural outlines of their buildings with incandescent lights; smaller establishments electrified their patriotic emblems. The Electricitäts Gesellschaft informs us that their works alone had to supply current on this occasion for over 30,000 extra lights, besides for the 6,500 extra ones with which they had illuminated the imposing façade of their new offices.——The Emperor has had a miniature railway station built for himself in close proximity to his Potsdam Palace-grounds on the Berlin-Potsdam line.

MISCELLANEOUS.

THE NATIONAL REGISTRATION OF PLUMBERS.—A public meeting was held on the 29th ult. at the Municipal Buildings, Southampton, under the presidency of the Mayor, to elect a District Council to carry out the national training and registration of plumbers in Southampton and district. The Council elected consisted of eight master plumbers, eight operative plumbers, and eight public representatives—the last including the Mayor, the Sheriff, Mr. Alderman Barford, Dr. Aldridge, J.P., Dr. Harris (Medical Officer of Health), and Mr. Morris Miles (Chairman of Council of the Hartley Institution). A deputation from the Worshipful Company of Plumbers, London, was present, consisting of Mr. Alderman Knill (Past Master), and the Clerk.——A public meeting, convened by the Leeds District Council in connexion with the movement for the national registration of plumbers, was held on the 30th ult., at the Philosophical Hall. There was a large gathering, composed largely of master plumbers, journeymen, and apprentices. Mr. J. W. Connon, F.R.I.B.A., President, was in the chair. The first annual report of the District Council, read by the Hon. Sec. (Mr. W. Braithwaite), stated that the movement for the national registration of plumbers, initiated by the Worshipful Company of Plumbers, had spread widely and rapidly. The District Registration Committee had considered 370 applications for registration from all parts of the county, and the result had been the registration of 160 master plumbers and 171 operatives. Of the fifteen persons asked to present themselves to the Examination Committee for examination, eight offered themselves, only three of them, however, being successful. In future, all candidates for registration who had not for some time been in the trade would have to submit to examination. Through the kindness of the Council of the Leeds School of Science and Technology, a class had been formed for instruction in the theory and practice of plumbing.

DISPOSAL OF THE DEAD AROUND LONDON.—At the weekly meeting of the Balloon Society of Great Britain, on the 30th ult., at St. James's Hall, Sir F. G. Milner, Bart., M.P., in the chair, a paper was read by the Rev. F. Lawrence, Hon. Sec. to the Church of England Burial, Funeral, and Mourning Reform Association, on the above subject. The lecturer said that the present condition of most suburban cemeteries had its origin in the introduction of the use of a coffin in Charles II.'s time. Previously, the dead had been buried in a linen or woollen shroud. The parish coffin used to be taken to the house of the dead, into which the corpse was placed and taken out for burial. At the grave side the body was laid into the earth without the coffin; earth was cast upon the body, not upon the coffin. The earth played the part of a slow crematory. Before the same grave was needed for another burial its former occupant had passed completely away. The use of a coffin had altered all this. The coffined bodies of the dead were now doomed to generate poisonous gases, which no hermetical sealing could restrain, and which generations hence might find their way as the avenging angels of violated nature. The remedy lay in a return to the old paths. The coffin must be perishable. The soil must be suitable and sufficient. The Legislature should intervene with a view to—(*a*) The more effectual protection of the public against the danger arising from the further general use of already overcrowded burial-places. (*b*) The more frequent inspection and more thorough supervisions of all burial-grounds. (*c*) The prevention of overcrowding by more stringent regulations. (*d*) The provision where necessary of properly appointed mortuaries. (*e*) The more accurate certification of the cause of death. (*f*) The securing proper earth for a cemetery before it be so used. Resolutions in support of these propositions, and calling upon the Government to close all the cemeteries in the Metropolis and transfer them to the London County Council for maintenance as open spaces, were carried, after an animated discussion.

THE ENGLISH IRON TRADE.—There is little animation in the English iron market, both consumers and producers showing great reserve. The moderate business which is taking place refers only to immediate wants. At the same time, although prices are easier, ruling quotations are fairly well adhered to, taking the trade all round. The fact is that buyers are expecting still lower values to prevail shortly, for what reason we are unable to perceive, seeing that raw materials and fuel keep comparatively high, while sellers hope much from the coming Spring trade, and consequently are disinclined to bind themselves forward. The Glasgow warrant market has been steady, with but a small business doing. Cleveland pig is 6d. a ton lower for prompt contracts, but firm forward. Hematite pig is practically unchanged. Finished iron is still quiet, owing party to the backwardness of users in placing orders, but partly to the unwillingness of manufacturers to budge as to prices. Sheets, however, have receded another 2s. 6d. a ton in Staffordshire, which makes them 10s. lower than at the beginning of the year. The tone of the steel market is weak, and most steel products are quoted this week 2s. 6d. a ton below the rates ruling a week ago. But as the wants of consumers, notably shipbuilders, must be met shortly, the downward tendency of the market ought to be arrested. The shipbuilding trade is still fairly well employed, and may be brisk again before long, as fresh orders for ships are in view. Most branches of the engineering trade keep active.—*Iron.*

A HUGE STEEL STRUCTURE.—The new Masonic Temple at Chicago, for the supply of structural steel of which a contract has just been obtained by the Columbia Iron and Steel Company, Pittsburgh, will be a building twenty stories high, the chief feature of which is a skeleton of steel, round which the masonry will be built. The building will measure 113 ft. by 170 ft. in plan, and will rest on a foundation of steel rails. The steel work will weigh between 3,500 and 4,000 tons, and will be made at Pittsburgh ready to be put together without any alterations. Every piece will be exactly fitted, holes drilled, connexions dovetailed, and all details adjusted, so that the work of erecting the skeleton can be proceeded with with celerity. In fact, the entire work of erecting the steel structure may be completed before the masons and bricklayers begin their part of the work. The contract for the steel has been taken at 300,000 dols., and the whole building is estimated to cost 2,000,000 dols.

ENGLISH SCULPTURE IN AMERICA.—Mr. Bruce Joy, the sculptor, has been gaining a great deal of praise in New York for a collection of his works which has been exhibited there.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Decoration of Concert Room	Liverpool Philharmonic Society	50l. 25l. and 15l.	Mar. 7
*New Municipal Offices, and Art, Science, and Technical Schools	Rochester Corporation	15l. 15s. 10l. 10s. & 5l. 5s.	Mar. 21
*Covered Market, Arcades and Shops, Halifax	Markets and Fairs Committee	100l. 50l. and 30l.	May 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*New Hospital, North Heigham	Norwich Corporation	P. F. Marshall	Feb. 19
Water Mains, Fittings, &c. Dynas Powis	Cardiff U.R.S.A.	W. Fraser	do.
Cast-iron Sleepers, Wheels, Axles, &c.	India Office	*Official*	do.
*Silicated Stone Pipe Fewer	East Ham Local Board	W. H. Savage	do.
Bridge Work, Station Fittings, &c.	South Indian Ry. Co.	*Official*	do.
Roadmaking and Fencing, South Winton	South Coast Freehold Land Society	Hankinson & Lane	Feb. 11
*Additions, &c. to Eastern Fever Hospital	Met. Asylums Board	Keith D. Young	do.
Pair of Semi-detached Villas, Ripon	W. Wells	G. Mallinson	do
New Passenger Station, Hebden Bridge	Lanc. & Yorks. Ry. Co.	*Official*	do.
Sewer Ironwork, &c.	St. Luke's Vestry (Middlesex)	do.	do.
*Sewer and Drainage Works	St. Saviour's Bd. of Wks	do.	do.
*Swimming Bath	Hackney Union	do.	do.
Public Hall and Workmen's Institute, Ynysbir, Rhondda Valley	Ynysbir & Wattstown Public Hall Co. Lim.	Chas. Taylor	do
Aerated Water Factory, Treslaw	Rhondda Valley Aerated Water Co. Lim.		Feb. 12
School, Craigbill-road	Leith School Board	George Craig	Feb. 13
Work at Parish Church, Willington, co. Durham		J. Allison	Feb. 14
*Works, Materials, &c.	Hendon Local Board	S. S. Grimley	Feb. 16
*70 to 80 Small Houses, &c. Sneerness-on-Sea	Messrs. A. E. F. England and Others		do.
Rebuilding House, Gloucester	H. T. Theobald & Co.	J. Fletcher Trew	do.
*Cleansing, &c. and Keeping in Repair, Southwark Bridge	Committee for Letting Bridge House Estates	*Official*	do.
Repairing Bridge over Clyde at Dalmarnock	Bridge Committee	Crouch & Hogg	Feb. 17
Excavating, Leveling, Fencing, &c. Recreation Grounds, Tredegar, Mon.	Ed. Morgan		do.
Granite and Flint Road Metal	Rochester Highway Bd.	*Official*	do
*Paving Sets	Dover Town Council	do.	do.
Public Hall and Caretaker's Cottage, Crickhowell	Public Hall Co. Lim.	E. A. Johnson	do.
*New Municipal Buildings	Sheffield Corporation	E. W. Mountford	do.
*Roadmaking Works	Brentford Local Bd.	J. H. Strachan	do.
*Paving and Sewering Works	Chiswick Local Board	Mr. Ransden	Feb. 18
*Works and Materials	do.	do.	do.
*Road Materials, &c.	County Borough of St. Helen's	G. J. C Broom	do.
*Road Works	do.	do.	do.
*Roadmaking and Paving Works	Fulham Vestry	W. Sykes	do.
*Laying Asphalte	do	J. P. Norrington	do.
Stabling, Covered Yard, and House, Albert Mills, Halifax		John Drake	do.
*Masons' and Pavlors' Work	Westminster Vestry	G. R. W. Wheeler	do.
Water Supply Works, Bagnell	Stoke-on-Trent R.S.A.	J. Beardmore	do.
New Infirmary and other Works	Pershore Union	Geo. Hunt	Feb. 19

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Works and Materials	St. Marylebone Vestry	*Official*	Feb. 19
*Broken Stone, Footway, Yorkshire, &c.	do.	do.	do.
Paving	do.	do.	do.
Presby. Chapel, Mt. Pleasant, Ebbw Vale	Mr. Mortimer		Feb. 20
*Alterations and Additions to Infirmary	Salisbury Infirmary	J. Harding & Son	do.
Electrical Communication at Asylum	Stafford Asylum Com.	*Official*	do.
*Works, Materials, &c.	Burbston Impt. Com.	do.	Feb. 21
New Club House	Lyndhurst Workmen's Club, Lim.		do.
Alterations and Additions to Schools, Coedpenmaen	Eglwysilan Sch. Bd.	Thos. Rowland	do
*Works, Materials, &c.	Kensington Vestry	*Official*	Feb. 24
*Public Conveniences, &c. Clissold-park	London County Council	do.	do
*Waterworks, Teversal	Mansfield U.R.S.A.	G. Hodson	do
*Works and Materials	War Department	*Official*	Feb. 25
Gasholder Tank	Stockton-on-Tees Corp.	do.	do.
*Road Works	Witham Local Board	C. Pertwee	Feb. 26
*Foundation Works, Asylum	Dorset County Lunatic Asylum	G. F. Hine	do.
*Building Materials	War Department	*Official*	Mar. 1
*Gasfitters' Works	Com. of H.M. Wks. &c	do.	Mar. 2
46 Villas and Cottages, Two Shops, &c. Barry	Park (Barry Dock) Building Co. Lim.	W. H. Dashwood Caple	do.
New Church, Knockninny, co. Fermanagh	Rev. Jas. O'Reilly	W. H. Beardwood	Mar. 4
*Works and Repairs to Public Buildings in London	Com. of H.M. Wks, &c.	*Official*	Mar. 5
*Chimney at Northfleet		Mr. Bates	No date
Two Houses, Burley Hill, Leeds		J. Evers	do.
Two Houses, Manston, Crossgates		do.	do.
Eight Houses, Wortley, Leeds	Joseph Thornton	F. W. Rhodes	do.
New Premises, Skinner-street, Newport, Mon.		Habershon & Fawckner	do.
Alterations, &c. to Fent Stores, Carlisle		H. H. Hodgkinson	do.
Eight Houses, Wylam-on-Tyne	William Yeats		do.
*Sewer's Works, Trees, Making-up and Paving Footways, &c.	West Ham	Jno. Hudson	do.
*Various Works, Kidsgrove, Staffs.	Clough Hall Park, &c. Co. Lim.	Jas. Stevens	do.
*Alterations, &c. to Public Buildings, Redhill	Redhill Market Hall Co.	Clayton & Black	do.
*New Premises, Devizes	Wilts & Dorset Banking Co.	G. M. Silley	do.
Chimney Stack (150 ft. high), Deepcar, Yorks	J. Gregory & Co.		do.
Alterations to Railway Hotel, Lancing, Sussex	G. F. Eden	R. A. Came	do.
Concrete Cover to Reservoir	Scarborough Corp	Mr. Millhouse	do.
24 Houses, Woodside, Horsforth		Fairbank & Wall	do.
New Institute, Derby	Young Men's Christian Association	Habershon & Fawckner Naylor & Sale	do

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Second-class Assistant Surveyors	Civil Service Com.	Not stated	Feb. 6
*Clerk of Works	Daventry Town Coun.	2l. 10s.	Feb. 14
*Clerk of Works	Oldham School Board	Not stated	Feb. 16
*District Surveyor	Nantwich [High. Bd.	120l.	do.
*Surveyor	Stroud Local Board	180l.	Feb. 18
*Assistant in Surveyor's Office	St. Marylebone Vestry	120l.	do.
*Surveyor	Bilston Township Com.	150l.	Feb. 24

Those marked with an Asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xx. *and* xxi.

LECTURES AT CARPENTERS' HALL.—The Worshipful Company of Carpenters announce a course of free lectures on "Matters connected with building," to be delivered at their hall, London-wall, at eight o'clock, on Wednesday evenings from February 11 to March 18. We gave a list of the lectures in the *Builder* for January 24, p. 76.

A LECTURE ON STAINED-GLASS WINDOWS.—At the Art Club, Upper Parliament-street, Liverpool, on the 2nd inst., Mr. C. W. Whall, of London, read a paper on "Stained Glass." The lecturer described and illustrated the working of a stained-glass window from its primary conception, and also performed in the presence of the audience the operations of cutting, tracing, and painting the glass, and described those of leading, firing, &c. Adverting to the resources of stained glass as a decorative material, Mr. Whall strongly condemned the attempts to produce realistic pictures in it. He deplored the extent to which the cheapness of stained glass, and the dangerous facilities of its production caused it to be used, to the abandonment of sculpture, fresco, and other noble means of decoration. The lecturer gave several hints for the guidance of those who might at some future time have something to do with the erection of stained glass or of any form of decoration. Mr. Whall concluded his observations with a regret that he had not been able to draw an entirely flourishing picture of stained glass as it is, but pointed out, with some hope for the future, the manner in which the various arts of architecture, painting, and sculpture were drawing closer together at the present time.

MEETINGS.

SATURDAY, FEBRUARY 7.

Royal Institution.—Mr. W. Martin Conway, M.A., F.S.A., on "Pre-Greek Schools of Art." III. 3 p.m.

Association of Public Sanitary Inspectors.—Annual Dinner. Holborn Restaurant, 6 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." I. 4.15 p.m.

MONDAY, FEBRUARY 9.

Clerks of Works' Association.—Eighth Annual Dinner Holborn Restaurant, 6.30 p.m.

University College (Archæology).—Mr. W. St. Chad Boscawen on "Babylonian Archæology and Art." IV. 5 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor H. Robinson on "Drainage." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. A. J. Hipkins, F.S.A., on "The Construction and Capabilities of Musical Instruments." III. 8 p.m.

TUESDAY, FEBRUARY 10.

Institution of Civil Engineers.—Discussion on Messrs. Llewelyn B., and Claude W. Atkinson's paper on "Electric Mining Machinery." 8 p.m.

Society of Arts (Applied Art Section).—Mr. Heywood Sumner on "Sgraffito." 8 p.m.

Birmingham Architectural Association.—Mr. H. O. Cresswell on "Sketching and Measuring." 7.30 p.m.

WEDNESDAY, FEBRUARY 11.

South Kensington Museum (Lecture Theatre).—Mr. Maurice Hewlett on "The Rise of the Renaissance in England." VI. 3.45 p.m.

Free Lectures to Artisans and others on Matters Connected with Building. Professor H. Robinson on "Sanitary and Insanitary Dwellings," Carpenters' Hall, London Wall. 8 p.m.

Society of Arts.—Sir Roper Lethbridge, M.P., on "The Proposed Irish Channel Tunnel." 8 p.m.

Sanitary Institute.—Dr. Louis Parkes on "Model Dwellings in London, and Overcrowding on Space." 8 p.m.

THURSDAY, FEBRUARY 12.

Society for the Encouragement of the Fine Arts.—Mr. J. Tedhunter on "An Unknown Painter." 8 p.m.

Institution of Electrical Engineers.—Discussion on Major-General C. E. Webber's paper on "The Distribution of Electricity, with especial reference to the Chelsea System." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Edinburgh Architectural Association.—Mr. Æneas J. G. Mackay, on "The Architecture of Scotch Towns, as Illustrating Scotch History." 8 p.m.

Dundee Institute of Architecture.—Mr. W. Norwell, on "Decoration in its Relation to Architecture." 7 p.m.

FRIDAY, FEBRUARY 13.

Institution of Civil Engineers (Students' Meeting).—Mr. W. Herbert Wheeler, on "The Cleaning and Deepening of Rivers and Canals by means of the Transporting-power of Water." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Lecture on "Sanitary Building Construction." 8 p.m.

SATURDAY, FEBRUARY 14.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." I. 3 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." II. 4.15 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

985.—WHITE PIGMENT: *H. Grimshaw.*—According to this invention metallic zinc is dissolved in a solution of zinc chloride, and the pigment precipitated. This pigment is afterwards ground in oil.

2,473.—CHIMNEYS OR FLUES: *J. Bennison.*—According to this invention a clay tube is built in the brickwork, extending to the roof or the apex of the chimney. The bottom, immediately above the fire, is cup or "trumpet shaped" at front or sides. Near the top an enlargement is formed, which is called an "anti-syphon chamber." In a chimney thus fitted down-draught is effectually prevented.

2,541.—SEWER VENTILATING SHAFTS: *F. Bird.*—To the underside of the manhole cover flaps are fitted. These are allowed to hang down vertically, but may be drawn up by a rod to the horizontal position, and fixed there by a button.

2,542.—VENTILATING COLUMNS: *F. Bird.*—This invention relates principally to means for enabling the connexion of the sewer ventilating pipe to be cut off when access is required to the column. The lower part of the column is in the form of a chamber, to which the sewer ventilating pipe is connected, the communication being under the control of a valve, by which the connexion is cut off where desired. At a convenient point perforated trays with charcoal are fitted to deodorise or disinfect the air.

2,787.—SAND-PAPERING WOOD: *E. Seddon.*—The principal improvement in sand-papering machines referred to in this invention is made by giving to the rollers a horizontal circular motion at the same time that they are revolving rapidly, so that the motion of any portion of the sand-paper surface is a continuously advancing circular motion, so that all scratches or marks made by the sand-paper are entirely removed. Mechanical means for effecting this motion are described in the specification.

18,476.—PLANES: *J. Habitzel* (Basel).—The plane which is the subject of this patent consists of a wooden stock, in the recess of which is fixed the metal bed of the plane iron; the iron is held in the bed by a spring plate, which replaces the cap, while by an adjustment of a screw on the screw spindle of the plane iron bed, the position of the latter, and consequently its penetration into the wood, can be regulated.

18,553.—DOOR SPRINGS: *G. Meyer* (Zurich).—This spring consists of a hollow drum rotating on a fixed arbour, secured at the upper part of a door-frame, around which winds a band attached at one end to the hollow drum, and at the other to the upper part of the door, unwinding when the door opens, and thereby winding a spring coil within the hollow drum, and made to rewind when the door is let go by reason of the spring coil recoiling.

NEW APPLICATIONS FOR PATENTS.

January 19.—929, N. Hart and W. Bone, Paint brushes.—933, C. Coe, Apparatus to prevent the bursting of Water-pipes.—937, E. and E. Atkins, Attaching Electrical Wires to Ceiling Roses.

January 20.—966, E. Arthur, Glazing or Enamelling Tiles, Bricks, &c.—972, J. Gascoyne, Window-fasteners.—977, W. Small and J. Ewart, Roof-gutters, 1,039, C. Herzog, System of Water-piping as a Protection against Frost.

January 21.—1,064, H. Lewis, Joiners' Bench-cramp.—1,078, C. Charlton, Reversible Windows.—1,096, F. Jackson, Stoves, or Fireplaces.—1,113, A. Frampton, Wood-flooring, Parquetry, Ceilings, &c.—1,116, W. Taylor, Cement.

January 22.—1,147, G. Heaton, Cottage Dwellings.—1,155, A. Mitchell, Bolts and Latches for Casements, &c.

January 23.—1,213, R. Pope and W. May, Sash Cord Fastener.—1,238, E. Hoyland, Chimney Cowl.—1,242, E.

Ardagh, Wooden Paving Blocks.—1,247, J. Shanks, Lavatories or Wash-hand Basins.—1,259, P. Bracher, Chimney Tops or Ventilating Terminals.—1,280, A. Elmendorf and others, Water-closets.

January 24.—1,300, P. Rogers, Curing Smoky Chimneys.—1,310, J. Hart, Draught, Dust, and Rain Stoppers.—1,317, W. Dalling, Chimney Tops.—1,337, W. Means, Building Construction.—1,345, H. Burnet, Preventing Water Pipes from Bursting.—1,358, E. Smith, Parquet Flooring.—1,360, W. Thompson, Stoves.—1,367, R. Coslett, jun., Flushing Cisterns for Water-closets, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

17,986, J. Clark, Pneumatic Flushing Apparatus for W.C.s, &c.—19,763, D. Baker, Closets and Fittings.—19,892, J. Burdon, Ventilating and other Gratings, &c.—19,991, P. Ayton, Casement Stays.—20,232, W. Kears and others, Storage Cistern and Water Waste-preventers.—20,730, J. McGlashan and E. Braidwood, Painters' Brushes, &c.—20,943, G. & C. Wernaer, Artificial Granite and Marble.—20,992, J. Jones, Electric Bell.—118, F. Pover, Ovens for Firing Bricks, &c.—231, J. Lloyd, Glaziers' Diamonds.—312, F. Holloway and E. Bastin, Tie Bricks.—355, H. Dent, Brickmaking Machinery.—417, W. Williams, Hanging Window-sashes.—509, W. Munns, Windows.—524, T. Hayton, Paving Slabs, &c.—535, G. Wise, Condensation Applied to Glazed Sashes, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

3,343, T. Fletcher, R. Brown, and W. Ure, Brick and Pottery Kilns.—4,343, T. Moss Flower, Spirit Level.—4,712, H. Doulton, Sewer.—12,423, H. Kilsey, Casement-fastener.—16,887, G. Redfern, Fire-grates.—16,852, J. Mason and Others, Treads for Floors, Stairs, &c.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JANUARY 27.—By *Ramsey & Co.*: 1 and 2 Rose Cottages, Peckham, u.t. 50 yrs., g.r. 8*l.*, r. 52*l.*, 25*l.*—By *S. B. Clark & Son*: 74, Mortimer-st., Regent-st., u.t. 16 yrs., g.r. 52*l.*, 540*l.*; 59, Clarence-gardens, Regent's-pk., u.t. 32 yrs., g.r. 21*l.*, r. 48*l.*, 180*l.*; 76 and 78, Augustus-st., u.t. 27 yrs., g.r. 28*l.*, 255*l.*—By *Debenham, Tewson, & Co.*: 2, Edbrooke-rd., Paddington, u.t. 72 yrs., g.r. 8*l.*, r. 44*l.*, 425*l.*; 43, Great Prescott-st., Aldgate, f., 400*l.*—By *Fuller & Fuller*: f.g.r. of 45*l.*, u.t. 928 yrs., Holland-pk-ter., Notting-hill, 1,915*l.*; f.g.r. of 37*l.* 10*s.*, with reversion in 46 yrs., 1,540*l.*

JANUARY 28.—By *J. T. Bedford & Co.*: The lease and goodwill of 2, Vigo-st., Regent-st., u.t. 14 yrs., 750*l.*

JANUARY 29.—By *Herring, Son, & Daw*: No. 47, Lavender-hill, u.t. 80 yrs., g.r. 8*l.* 10*s.*, 1,090*l.*—By *E. Stimson*: 1, Church-row, Chislehurst, u.t. 50 yrs., g.r. 7*l.* 10*s.*, r. 90*l.*, 1,000*l.*; 53, Talfourd-rd., Peckham, f., 500*l.*; 12, Chivalry-rd., Clapham Junction, u.t. 77 yrs., g.r. 10*l.* 10*s.*, 360*l.*—By *Wilkinson, Son, & Welch* (at Brighton): 49, Goldstone-villas, Brighton, f., r. 35*l.*, 500*l.*; 3, College-rd, f., r. 70*l.*, 1,290*l.*

JANUARY 30.—By *Rushworth & Stevens*: 38, Arbery-rd., Bethnal Green, u.t. 79 yrs., g.r., 5*l.* 10*s.*, r. 37*l.* 14*s.*, 270*l.*; 87 and 89, Talgarth-rd., West Kensington, u.t. 86 yrs., g.r. 24*l.*, r. 115*l.*, 1,010*l.*—By *R. Reid*: 1 and 2, Lumsden-st., Blackwall, f., r. 31*l.* 4*s.*, 325*l.*; 14 and 16, Gaselee-st., f., r. 31*l.* 4*s.*, 220*l.*; 20 and 24, Gaselee-st., f., r. 33*l.* 16*s.*, 235*l.*; f.g.r. of 312*l.* 2*s.*, with reversion in 55½ yrs., Richmond-rd., Bayswater, 8,895*l.*; f.g.r. of 40*l.*, with reversion in 55½ yrs., Talbot-rd., 1,07*5l.*; f.g.r. of 10*l.* 15*s.*, with reveraion in 55½ yrs., 530*l.*; f.g.r. of 10*l.* 12*s.*, with reversion in 55½ yrs., Victoria-pl., 3,065*l.*; f.g.r. of 232*l.* 10*s.*, with reversion in 55½ yrs., Artesian-rd., 3,375*l.*; f.g.r. of 49*l.*, with reversion in 55½ yrs., Norfolk-rd., 1,350*l.*; f.g.r. of 5*l.*, with reversion in 55½ yrs., 350*l.*; f.g.r. of 243*l.* 9*s.*, with reversion in 55½ yrs., Ledbury-rd., 6,865*l.*; No. 97*A*, Talbot-rd., f., r. 35*l.*, 1,660*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.		
ton	6/15/0	7 5/0
Teak, E.I.... load	10/0/0	13/0/0
Sequoia, U.S.ft.cu.	2/3	3/0
Ash, Canada load	2/10/0	4/5/0
Birch, do.	2/0/0	4/5/0
Elm, do.	3/10/0	4,15/0
Fir, Dantzic, &c.	2/0/0	3/15/0
Oak, do.	2/10/0	4/10/0
Canada.....	4/17/6	6/10/0
Pine, Canada red	2/10/0	3,10/0
Do, yellow	2/0/0	5/10/0
Lath, D'antzic,fath	5/0/0	6/0/0
St. Petersburg	5/0/0	7/0/0
Deals, Finland,		
2nd & 1st std 100	7/10/0	10/0/0
Do, 4th & 3rd ..	7/0/0	7,5/0
Do. Riga	6/0/0	8/0/0
St. Petersburg,		
1st yellow ..	9/10/0	14/10/0
Do. 2nd yellow	7/10/0	9/0/0
Do. white	7/0/0	10/0/0
Swedish	7/0/0	15/10/0
White Sea	8/0/0	17/0/0
Canada, Finelst	14/0/0	24/0/0
Do. do. 2nd....	9/0/0	16/0/0
Do. do. 3rd, &c.	7 0/0	10/0/0
Do. Spruce. 1st	8/10/0	10/10/0
Do. do. 3rd & 2nd.....	6/10/0	8/0/0
New Brunswick	5/10/0	7/10/0
Battens, all kinds	4,10/0	15/10/0
Flooring Boards,		
sq., 1 in. prep.		
1st	0/10/0	0/14/0
Do. 2nd	0/8/0	0/10/6
Other qualities	0.5/6	0/7/9
Cedar, Cuba ..ft.	/4	/5
Honduras, &c.	/4½	/4½
Mahogany, Cuba.	/4½	/6½
St. Domingo,		
cargo av	/4½	/6½
Mexican do. do	/4½	/5½
Tobasco do. do	/5½	/6½
Honduras do..	/5½	/6½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio.....	12/0/0	14/0/0
Bahia	10/0/0	16/0/0

TIMBER (*continued*).

Satin, St. Domingo .....ft.	0/0/9	0/1/3
Porto Rico	0/0/10	0/1/6
Walnut, Italian..	0/0/4	0/0/7
METALS.		
IRON—Bar, Welsh, in London..ton	6.5/0	6/15/0
Do. do. at works in Wales	5/15/0	6.5/0
Do. Staffordshire, in London	6/5/0	7/0/0
COPPER—British, cake and ingot	55/0/0	57/0/0
Best selected ..	58/0/0	60/0/0
Sheets, strong..	68/0/0	0/0/0
Chili, bars	52/10 0	0/0/0
YELLOW METAL.lb.	0/0/6	0/0/6½
LEAD — Pig, Spanish ....ton	12/0/0	12/12/6
English, com. brands	12/12.6	12/15/0
Sheet, English, 3 lbs. per sq. ft. and upwards ..	15/0/0	15/5/0
Pipe	15/10/0	0/0/0
ZINC — English sheet ..... ton	25.5.0	26/10/0
Vieille Mon tagne	27/0/0	0/0/0
TIN—Straits 90 10/0		0/0/0
Australian 90.15/0		0/0/0
English Ingots	94/10/0	0/0/0
OILS.		
Linseed .....ton	22/0/0	22/5/0
Cocoanut, Cochin	32 15/0	34/0/0
Do. Ceylon	28.15/0	29/0/0
Palm, Lagos	22/10/0	26/0/0
Rapeseed, English pale	29/5/0	0/0/0
Do. brown	27.5/0	27/10/0
Cottonseed ref..	18/7/6	0/0/0
Oleine	22/0/0	24 0/0
Lubricating, U.S.	6/0/0	7/0/0
Do. refined.	7/10/0	12/0/0
TAR—Stockholm barrel	1/1/6	1/2/0
Archangel	0/14/6	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ASHBY-DE-LA-ZOUCH.—For the construction of pipe sewers with manholes, &c., Coalville, for the Rural Sanitary Authority. Mr. John W. Metcalf, Surveyor, 31, Tamworth-road, Ashby-de-la-Zouch :—

Geo. F. Todd, Derby (accepted)	£173 0 0

BANGOR.—For enlarging and altering "Menai Bridge Vaults," for Messrs. Worthington & Co., Limited, Burton-on-Trent. Mr. Richard Davies, architect, Bangor, North Wales :—

R. & J. Williams	£998	E. Williams, Garth, Bangor*	£972

* Accepted.

BIRMINGHAM.—For building house and stabling, Barnt Green, for Mr. S. Caswell. Messrs. J. F. Sharp & Co., architects :—

F. Briley	£1,940	Ruins & Sons	£1,875
E. Giles	1,900	J. Webb	1,777
G. Gill	1,897	Walton Bros.	1,775
J. Gethin	1,892	G. H. Marshall	1,720
B Whitehouse.	1,885		

BIRMINGHAM.—For house, lodge, and stabling, Barnt Green, for Mr. T. Hughes. Messrs. J. P. Sharp & Co., architects :—

G. Gill	£2,600	Ludrey & Evans	£2,373
J. Webb	2,495	F. Briley	2,350
Walton Bros.	2,484	B. Whitehouse	2,349
T. Johnson	2,435	E. Giles	2,320
F. Davis	2,426	G. H. Marshall (accepted)	2,297

BIRMINGHAM.—For the erection of a house, Westfield-road, Edgbaston, for the Rev. Robt. Aldridge. Messrs. J. P. Sharp & Co., architects :—

Gowing & Ingram (accepted)	£1,439 0 0

BIRMINGHAM.—For additions to printing works, Paternoster-row, for Messrs Comi Bros. Messrs. J. P. Sharp & Co., architects :—

G. Gill (accepted).....	£507 0 0

BRENTWOOD.—For providing and laying a 9-in. glazed pipe-drain to Shenfield, for the Billericay Union Rural Sanitary Authority :—

	s. d.	
George Burtwell	9 6	Per Yard.
Rogers & Robson	7 6	,,
R. Claydon.....	6 0	,,

[All of Brentwood.]

CARDIFF.—For re-building the "Queen's Hotel," Cardiff, for Mr. W. J. Jeenes. Quantities by the architect :—

D. Davies.....	£16,450 0 0	R. Price	£15,300 0 0
F. S. Lock	16,069 0 0	Burton & Co.	14,950 0 0
J. Hopkins	15,961 2 8	D. J. Davies	14,930 0 0
J. Haines	15,648 0 0	Shepherd & Son ...	14,340 0 0
Joues Bros.	15,600 0 0	J Allan (accepted)	14,329 0 0

[All of Cardiff.]

CORNWALL.—For re-building the Trekerrier Bridge, over the river Lynher, for the Cornwall County Council. Mr. S. W. Jenkin, County Surveyor, Lezkard :—

J. D. Hobbs	£275	Hicks & Hoar, Rills Mill, Linkinhorne, Cornwall*	£248

* Accepted.

FALMOUTH.—For building hedges and for masons' and smiths work at the Rural Ground, for the Rural Board of the Town and Parish of Falmouth. Mr. W. H. Treidder, Borough Surveyor, Falmouth :—

James Hodge	£179 14 0	Saml. Bray, Falmouth*	£316 0 0
W. Anstey	128 0 0		

* Accepted.

Granite Work for Entrance.

C. Barnicott, Falmouth (accepted)	£37 10 0

Iron Gates.

W. Jane, Falmouth (accepted)	£17 18 6

HAMMERSMITH.—For road and paving works, Willow-vale, for the Hammersmith Vestry. Mr. H. Mair, Surveyor, Vestry-hall, Broadway, Hammersmith :—

Killingback & Co.	£775	Tomes & Wimpey, Hammersmith*	£675
Nowell & Robson	689		
Rogers & Co.....	680		

* Accepted.

HANLEY.—For alterations to the "Wheat-Sheaf" Inn, Broom-street, for Messrs. W. Showell & Son. Mr. E. Penn, architect, Stoke :—

Geo. Harris, Stoke (accepted)	£240

KENT.—For ground-work, &c., at the Gore Farm Hospital, Kent, for the Metropolitan Asylum Board. Messrs. A. & C. Harston, architects, 15, Lendenhall-street, E.C. :—

F. White	£342 16 0		
C. Osborne, Westerham, Kent (accepted)	310 0 0		

LEAMINGTON.—For wrought-iron arched bridge over the Leam. Mr. W. de Normanville, Engineer, Town-hall, Leamington

Gimson	£2,067 16 0	W. Jenkins	£1,672 0 0
J. Dixon.....	1,863 19 7	A. Thorne, 143,	
J. Glover & Son	1,686 16 6	Cannon - street,	
Jesse Tildesley.....	1,659 0 0	London (accepted).	1,528 0 0

LEEDS.—Accepted for the erection of a Wesleyan Sunday school, infants' school, class-rooms, &c., Dewsbury-road. Mr. George F. Danby, architect, 46, Great George-street, Leeds :—

Paul Rhodes, *Bricklayer and Mason*, Leeds	£1,020	0	0
Thos. Harrod, *Carpenter and Joiner*, Leeds	630	0	0
J. Lindley, *Plumber and Glazier*, Leeds	192	0	0
W. Atkinson, *Slater*.....	80	0	0
W. Pennington, *Plasterer*.....	83	0	0
A. Bateman, *Painter*	36	0	0
Total.....	£2,043	0	0

LONDON.—For the erection of a school to provide accommodation for 800 children on the Ilderton-road Site, Rotherithe New-road, for the School Board for London. Mr. T. J Bailey, Architect :—

	If brickwork be built in cement.
J. T. Chappell	£18,917 ..... £19,307
D. Charteris	18,896 19,334
J. Mowlem & Co.....	18,816 18,740
S. & W. Pattinson	17,416 17,690
Peto Bros.	16,782 17,196
W. H. Lorden & Sons.....	16,502 16,869
W. Downs	16,387 16,667
Atherton & Latta.....	16,176 16,566
C. Cox	15,896 16,276
E. Lawrance & Son.....	15,852 16,250
J. Bull, Sons & Co., Limited	15,927* 16,070
J. W. Hobbs & Co., Limited	13,760 14,078

* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of two new iron buildings on the site in Bailey's-lane, Stamford-hill, for the School Board for London. Mr. T. J. Bailey, Architect :—

J. Dixon & Co.....	£1,408	W. Jones	£1,060
T. Cruwys	1,200	Crogzon & Co., Ltd.....	1,085*

* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of two new iron buildings on the site in Glyn-road, Homerton, for the School Board for London. Mr. T. J. Bailey, Architect :—

J. Dixon & Co.....	£1,486	Crogzon & Co., Limited....	£1,075
W. Jones	1,110	T. Cruwys*.....	1,060

* Recommended by the Works Committee for acceptance.

LONDON.—For rebuilding the "Three Stags" tavern, Lambeth-road, for Mr. John Germau. Mr. Alfred Wright, architect and surveyor, 61, Kennington-road, S.E. :—

John J. Ford.....	£4,798 0 0	Burman & Sons	£3,839 0 0
Gould & Brand....	4,079 0 0	E Toms	3,803 0 0
Canning & Mullens .	4 050 0 0	W. Johnson	3,810 0 0
J. Mills	4,030 0 0	J. Tyerman	3,750 0 0
W. Smith	4,030 0 0	T. Voller	3,746 0 0
Allen & Sons.....	3,967 0 0	J. Beale	3,600 0 0

LONDON.—For the erection of a pair of semi-detached houses in Hardy-road, Westcombe-park Estate, Blackheath. Mr. A. Broad, Architect, 27, Dingwall-road, Croydon :—

Kirk & Randall	£1,920	S. J. Jerrard	£1,700
J. Smith & Son	1,835	Baalam Bros.	1,700
G. Carter	1,800	Super (accepted)	1,570
E. P. Bulled.....	1,797		

LONDON.—For alterations to the "Cambridge Hotel," Westow hill, Norwood, for Mr. Minto. Mr. H. T. Bonner, architect, 29 and 30, King-street, E.C. :—

Bowyer	£2 130	Robson	£1,900
Walker	2,038	Hayward	1,884
Poole	1,989	Smith	1,877
Toms	1,927	Holloway	1,859
Spencer	1,934		

LONDON.—For pulling down and rebuilding the "Foresters' Arms tavern, Kanual New Town, W., for Mr. E. Tabernacle. Messrs. Wylson & Long, architects, 15, King William-street, Strand, W. C. :—

Riddie	£4,298	T. L. Green	£4,172
Fatman & Fotheringham..	4,078	J. T. Chappell	3,842
Adamson & Sons	3,976	C. F. Kearley (accepted) .	3,769

LONDON.—For the erection of mortuary buildings at the rear of police-station, Mare-street, Hackney, for the Hackney Board of Works. Mr. Jas. Lovegrove, Chief Surveyor, New Town Hall, Mare-street, Hackney. Quantities by Mr. Peterson, 12 and 13, Poultry, E.C. :—

G. Moore	£2,234 5 6	J. W. Mollett	1,861 0 0
C. Wilson	2,224 0 0	A. Martin	1,798 12 0
Allen & Son	2,196 0 0	Brass & Sons.....	1,798 0 0
Thomas Boyce	2,196 0 0	Shurmur, Upper Clapton (accepted)	1,764 0 0
Wm. Neill.....	2,175 0 0	Sabey & Son.....	1,728 0 0
Charles Cox	1,970 0 0	Thomerson & Son ..	1,727 10 0
Thomerson & Son ..	1,927 10 0	William Higgs.....	1,619 15 0

LONDON.—For alterations and additions to stables, for the Junior Army and Navy Stores (Limited). Mr. F. Dudley, architect :—

F. & H. Lawris (accepted)	£1,330 0 0

LONDON.—For the restoration of St. Benet's Church, Queen Victoria-street, after damage by the late fire, for the Earl of Powis and others. Mr. Herbert Knight, architect, 1.20, Cheapside :—

F. Prater, Walthamstow (accepted)	£627

LONDON.—For the erection of shops with flats above at Clapham road (corner of South Island-place), for Mr. G. J. Pearson. Mr. A. W. Tribe, 216, Kennington park-road, S.E., architect :—

W. & C. H. Young, Courland-grove, Clapham (accepted)..	£925 0 0

LONDON.—For the erection of workmen's dwellings in Brighton-street, and Argyle place, Cromer-street, Gray's Inn-road, W.C., for the East-End Dwellings Company, Limited. Messrs. Davis & Emanuel, architects, 2, Finsbury circus, E.C. :—

Holliday & Greenwood....	£11,333	Colls & Sons.....	£10,499
Mowlem & Co.....	10,738	P. & F. Wood.....	10,259
Rider & Sons.....	10,696	Woodward & Co	10,274
Ashby Bros.	10,610	Harris & Wardrop	10,270
Dove Bros.	10,570	Lawrence & Sons	10,269
		S. I. Jennard (accepted) ..	10,269

LONDON.—For sanitary work at Mary-place Workhouse, &c., for the Guardians of St. Mary Abbotts, Kensington. Messrs. A. & C. Harston, architects, 15, Lendenhall-street, E.C. :—

J. Mears	£475 0 0	W. B. Head & Son	299 0 0
A. W. Derby	395 0 0	W. Johnson	293 0 0
H. Haynes	343 0 0	Leslie & Co. (accepted)	293 10 0

[Architect's estimate, £280.]

LONDON.—For the erection of a mortuary, coroner's-court, offices, and rooms attached thereto, in George-yard, Whitechapel, for the Whitechapel District Board of Works. Mr. Wm. La Riviere, architect to the Board, Great Alie-street, E. Quantities by Mr. Herbert O. Ellis, 48, Fenchurch-street, E.C. :—

G. Lunnis Son	£2,335 14 0	J. Cattley	£2,030 0 0
W. Catmur	2,250 0 0	A. Eaton.....	2,049 0 0
J. R Munt	2,149 0 0	Outhwaite & Son....	2,044 0 0
Jno. Greenwood	2,134 0 0	Coulsell Bros.....	1,992 0 0
F. & F. J. Wood	2,096 0 0	Thos. Little	1,895 0 0
Perry & Co.	2,094 0 0	W. Gladding.....	1,888 0 0
J. Morter	2,094 0 0	Mark Gentry	1,885 0 0
Ashby & Horner	2,088 0 0		

LONDON.—For the erection of house, Kensal Green, for Mr. G. Fuller. Mr. Thos. S. Stephens, architect :—

F. T. Chinchen, Kensal Green (accepted)	£330 0 0

LONDON.—For sanitary alterations at 27, Hyde Park-gardens. Mr. Mr. George A. Hall, architect, 7, Victoria-street, S.W. :—

The North British Plumbing Co.....	£223 0 0
The Sanitation Co., Limited, 14, Victoria-street, S.W. (accepted)	212 0 0

MIDDLESBROUGH.—For the erection of the Victoria-road schools (exclusive of heating or furniture) for the School Board. Mr. J. Mitchell Bottomley, architect, 18, Albert-road, Middlesbrough :—

J. Howe	£11,180 0 0	Wm. Sturdy	£10,150 0 0
J. Johnson & Son...	10,845 7 0	Craggs & Benson ..	9,900 0 0
John Hall, Thorp, & Bell	10,469 0 0	Allison Bros	9,850 0 0
Robt. Kitching	10,428 0 0	R. Braithwaite	9,895 0 0
John Johnson	10,279 10 0	Wm. Bastman....	9,882 16 4
Jonas France	10,211 0 0	W. & R. Blackett..	9,750 0 0
Hudson Bros.....	10,154 0 0	Thos. Dickinson, Middlesbro'*	9,650 0 0

* Accepted.

NEW TREDEGAR.—For the erection of 34 cottages, for the New Tredegar Building Company, Limited. Mr. John Morgan, architect and surveyor, Blaenavon :—

Osborne & Co., East Grinstead	£4,012

NORTHAMPTON.—For the erection of new offices, Cattle Market, for the Corporation. Mr. W. J. Brown, Borough Surveyor, 11, St. Giles'-street, Northampton. Quantities by the Borough Surveyor. :—

J. Robinson	£265 0	G. J. Fisher	£235 0
R. Cosford	264 10	J. Warren	227 0
J. B. Clarke	252 0	R. Hickman	224 0
Green Bros.....	245 0	Woodford & Son	220 0
G. White.....	245 0	A. P. Hawtin, Northampton (accepted)	219 0
Clayson Bros.....	244 0		

RAMSGATE.—For alterations and additions, No. 17, Harbour-street, for Mr. Geo. Bates. Messrs. Langham & Cole, architects, Ramsgate and Broadstairs:—

	Main Building.	Fittings.
W. W. Martin	£1,200 0 0	£223 0 0*
Newby Bros	1,107 0 0	227 0 0
Chas. Home	1,100 0 0†	200 0 0
C. J. Luff	—	255 14 0

* Accepted subject to modification. † Accepted.

SOUTH BRENT (Devon).—For additions to Lutton House. Mr. R. C. Reade, M.A., architect, Torquay

W. A. Goss	£218 0 0	Yabsley & Hodge	£153 0 4
R. Veale	166 0 0	R. Codd, South Brent*	135 10 0

* Accepted.

SOUTH SHOEBURY.—For additions to Board Schools, South Shoebury, Essex. Mr. Walter J. Wood, architect, 1, Finsbury circus, E.C. Quantities by Mr. Henry Bushell:—

Baker & Wiseman	£770 0 0	Woodhams	£671 0 0
Darke & Son	695 0 0	Alp & Vintris, Shoe-bury (accepted)	668 16 7
Dupont	694 0 0		

SOWERBY BRIDGE.—For the supply of fireclay retorts, fire-bricks, clay, &c., at gas-works, for the Local Board. Mr. John Marsland, Engineer, Gas works, Sowerby Bridge, Yorks:—

Josh Morton, Halifax, 3s. 6d. per ft. retorts (accepted).
The Elland-cum-Greetland Brick and Tile Company, Halifax, £2. 17s. 6d. per 1,000 bricks (accepted)
John Morton, Halifax, £2. 17s. 6d. per 1,000 bricks
Geo. & W. Hallwell, Halifax, £2. 17s. 6d. per 1,000 bricks.
Glenboig Clay Co., Glasgow, { £4. 15s. 0d. bricks. 4s. 9d. per ft. retorts
Peter Hartt, Glasgow { £4. 0s. 0d. bricks. 5s. 0d. per ft. retorts.

STOKE-UPON-TRENT.—For alterations to the "Holly Bush" Inn, Fenton, for Messrs. W. Showell & Sons. Mr. E. Penn, architect, Stoke:—

Chatfield	£263	Harris, Stoke (accepted)	£215
Yoxall	220		

STOKE UPON TRENT.—For house in James street, for Mr. Geo. Bartle. Mr. E. Penn, architect:—

J. R. Yoxall, Stoke (accepted) £305

STOKE-UPON-TRENT.—For alterations to the "Cock" Inn, John-street, for Messrs. Charrington & Co. Mr. E. Penn, architect:—

G. H. Hancock (accepted) £134 0 0

Painting and Papering.

Cartlidge (accepted) £47 0 0

STOKE UPON-TRENT.—For alterations to the "Jolly Potters" Inn, Hartshill, for Mr. Chatfield. Mr. E. Penn, architect

Gallimore	£270	Harris	£180
Bradbury	200	Yoxall (accepted)	150

STOKE UPON TRENT.—For erecting two cottages in West street, Penkhull, for Mr. Alderman Lomax. Mr. E. Penn, architect:—

Bradbury	£517	Harris	£493
Hancock	490	Yoxall (accepted)	455

STRATFORD, E.—For additions to the Theatre Royal. Mr. J. G. Buckle, architect, 19, York buildings, Adelphi:—

D. G. Laing & Son (accepted) £1,574 0 0

TEWKESBURY.—For alterations and additions to the Town-hall, for the Corporation. Messrs. Medland & Son, architects, Gloucester. Quantities by Mr. F. E. Godwin, Gloucester.

Reed, Blight, & Co.	£2,299 0 0	Freeman & Jones	£1,423 0 0
H. Wilcox	1,540 0 0	W. Bowers & Co.	1,302 0 0
J. Greenslade	1,530 0 0	Malvern & Sons	1,283 0 0
W. & Cousins	1,497 0 0	E. Young	1,089 7 6
Wm. Jones	1,480 0 0	J. W. Howell Tewkesbury (accepted)	979 15 0
Henry Smith	1,442 0 0		

TONBRIDGE.—For detached residence, Hilden Manor Estate, Tonbridge. Mr. W. B. Hughes, architect:—

Rudeforth	£1,397 10 0	Mason & Elwig	£1 138 0 0
Langridge	1 196 0 0	Jarvis	1 105 0 0
Avard	1,139 0 0	Jones	1,118 4 5

Weights and Measures Offices, Newington. In the list of tenders for this job, published last week (p. 97) for "F. T. Churcher" read "F. T. *Chinchen*"

TO CORRESPONDENTS.

N. S. (we wrote from personal knowledge of the place).—W. H. (the top stone of the southern spire of Cologne was laid on the occasion of the "completion" fête in 1880 but a good deal of work has been done since then in the way of sculpture, and repairs to the roofs and floor. The second pair of new doors has only just been fixed).—J. H. (a hoisting scaffold of that kind for interior work is nothing new).—A. D. K. & Co. (paper referred to not to hand up to going to press. Shall have attention when received).—G. L. S. A. C. (shall have attention).—F. T. (next week).—S. W. (list cannot be inserted, as our conditions are not complied with. Amounts should be stated).—B. C. & Co. (amount should be sent).—S. & Sons (too small).—C. W. (should send amount).—O. & Co. (too late for this week.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

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The Builder.

VOL. LX. No. 2206. SATURDAY, FEB. 14 1891.

ILLUSTRATIONS.

Proposed Concert Hall, Langham-place: Exterior View.—Mr. T. E. Knightley, Architect ..... *Double-Page Photo-Litho.*
Interior View of Proposed Concert-Hall, Langham-place.—Mr. T. E. Knightley, Architect ..... *Double-Page Photo-Litho.*
Byzantine Architecture: Illustrations to Professor Aitchison's Royal Academy Lectures:—
St Mark's, Venice: Longitudinal Section ..... *Double-Page Ink-Photo.*
Paris Bridges: Pont Marie, Pont-Viaduc du Point du Jour, and Pont St. Michel ..... *Single-Page Ink-Photo.*
Staircase to Chapter-House, Beverley Minster.—Drawn by Mr. K. Sakurai ..... *Single-Page Ink-Photo.*

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The Seine Bridges at Paris.

ATTENTION has been made several times of the large railway station which it is proposed to establish on the Esplanade des Invalides, at Paris, to serve as a terminus to the Moulineaux Railway. This scheme will involve the construction, opposite to the Ministry of Foreign Affairs, of a bridge intended to connect the new railway station directly with the Quai de la Conference and the Champs Elysées.

This will raise to the number of twenty-nine the bridges crossing the Seine within the area of Paris. As most of these bridges have some historic associations connected with them and have each their own characteristic physiognomy, and as they form an important feature in the general picturesque and architectural effect of Paris, it may be of interest to give some brief account of these structures, containing in part information which is not obtainable from the ordinary sources of guide-books.

Following the course of the Seine down stream, we come first on the "Pont National," a bridge which till 1870 bore the name of "Pont Napoléon," and which forms the crossing for the chemin-de-fer de ceinture at the eastern extremity of Paris. Like most of the constructions built under the Empire, the bridge was re-christened under the Third Republic. It was built in 1853, and is composed of five semicircular arches built in stone. A wrought-iron railing which divides the bridge from end to end separates the railway from the road reserved for ordinary vehicles and foot-passengers. The initial of Napoléon III. crowned with an oak garland forms the only decoration of the bridge.

We come next on the "Pont de Tolbiac," an iron bridge constructed in 1879-1884, as a prolongation of the road after which it is called. It connects the warehouses of Bercy with the Quai de la Gare. The next bridge, the "Pont de Bercy," was built in 1864. Neither of these present any point for special mention.

The "Pont d'Austerlitz," originally constructed of iron, has been entirely rebuilt of stone some years ago. It is a large bridge with a heavy traffic, which connects the Quai de la Rapée with the Place Walhubert, adjoining which are the railings of the Jardin des Plantes. At this point the Seine divides into two parts which embrace successively the Île St. Louis and the Île de la Cité. At the eastern extremity of the first of these islands, opposite the Hôtel Lambert, is a bridge divided into two parts, the "Pont Sully," completed in 1876. This double bridge connects the Boulevard St. Germain, the largest thoroughfare on the left bank, with the Boulevard Henri IV. Three iron arches with stone abutments compose the part which extends between the Boulevard St. Germain and the Ile St. Louis. Previously this portion of the river was crossed by a suspension bridge, called the Pont de Constantine. It gave way and fell into the Seine some years before the war. The second part of the Pont Sully connects the Île St. Louis with the right bank; there is connected with it a light foot-bridge on piles, accessible only to foot passengers, and which connects the Île St. Louis with the Quai Henri IV. This passage-way, which can hardly claim to be a bridge, is known however by the name of the "Pont de l'Estacade." The Pont de Sully itself, the part connected with the right bank, consists of an iron arch abutted on each side against a stone arch.

Proceeding along the right bank, we come to a bridge commenced in 1604 and terminated in 1635, called the "Pont Marie" (see lithograph). It was originally covered with houses which were partly carried away by a rising of the Seine in 1698, and were entirely pulled down and removed in 1789. The name of Marie is that of the engineer under whom it was built; it is composed of five semicircular arches in stone, of which the piers are decorated with niches empty of their statues.

The "Pont Louis Philippe," which follows next, was built in 1833, which title was changed in 1848 to that of "Pont de la Réforme," the old name being subsequently restored. At first a suspension bridge, it was rebuilt in masonry in 1862, and consists now of three elliptical arches separated by two piers.

Between this bridge and the following one, on the bank of the river, is the fruit market known under the name of the "Mail." It is here that in autumn the heavy barges laden with apples from Normandy and raisins from Bourgogne and Fontainebleau are unloaded. The "Pont d'Arcole," which is the next in order, is of comparatively recent date, but the origin of its name, oddly enough, is already obscure, and it is disputed whether it received its name as a souvenir of Napoléon's victory at Pont d'Arcole, or whether it is to perpetuate the name of a young insurgent who was killed at this point, in 1830, with arms in his hand, as he was leading the people to the Hôtel de Ville. The incendiaries of the Commune in 1871 having destroyed the municipal archives, it is now impossible to ascertain the facts, but we should doubt very much whether the Government of Louis Philippe would thus have consecrated the recollection of a barricade combat which would have formed a memento of its own revolutionary origin. The bridge, which is situated between the place de l'Hôtel de Ville and the street which conducts to the enclosure of Notre Dame, has gone through a good many vicissitudes. It was at first a mere suspension bridge for passengers, which, in 1856, was replaced by the existing bridge, an iron one of a single elliptical arch. This new bridge, which nearly failed two years ago, has had to be almost entirely reconstructed.

On the site of the Pont Notre Dame, which is the next in order, there was at the end of the fourteenth century a wooden bridge called "Le Planche Mibray," replaced towards 1413 by another wooden bridge which carried sixty houses constructed on one plan and occupied by various trading corporations, with the exception of the money-changers and goldsmiths, whom we shall come upon just now on another bridge specially set apart for their residence. On October 24, 1499, the Pont Notre Dame gave way with all its houses, and after this catastrophe the Cordelier monk Jean Joconde was commissioned to build, in its place, a stone bridge carrying seventy houses. This became the ordinary place of celebration of the fêtes and solemnities given by the municipality of Paris. In 1590 the legate of the Pope there passed in review the army of the League. Lastly in 1660, the houses were adorned with statues

and medallions. Houses, statues, and all disappeared under the Revolutionary tempest, which suppressed even the original name of the bridge, which then became the "Pont de la Raison." After numberless reparations, it was rebuilt completely in 1853. Of the original work there remains only the lower portion of the piers and the voussoirs of the arches. We may just refer to the fountain which was a few years ago affixed to the centre arch. It was adorned by a bas-relief by Jean Goujon and a portrait of Louis XIV. accompanied by a Latin inscription written by the poet Santeuil.

The "Pont au Change," the name of which explains itself, and which was at first a timber bridge, connects the Place du Châtelet with the Boulevard du Palais. It is there that the goldsmiths and money-changers resided in the low and damp houses built along the two parapets. Many times carried away by floods, and rebuilt sometimes in wood sometimes in stone, it was never rebuilt in a really solid manner until 1639, from which time it lasted till 1859, the date of its last transformation. The houses which had encumbered it had a long time before disappeared, at the time when it was proposed to reconstruct it as it is at the present time, of three elliptical stone arches, and with parapets and square balusters. There existed for a long time, at the end of this bridge, a small monument in black marble raised in honour of Louis XIV., whose figure was represented on a pedestal, with Louis XIII. and Anne of Austria by his side.

We now arrive at the Pont Neuf, one of the most interesting of all the bridges both for its antiquity and the recollections which attach to it. The first stone was laid on May 31, 1578, in the presence of King Henri III. Androuet Ducerceau directed the works, which the civil wars, however, soon interrupted. It was not till 1602, under Henri IV., that the work was taken up again under the direction of Guillaume Marchant, architect to the king. The bridge is carried on twelve circular arches, above which is a console cornice which Germain Pilon decorated with some very original grotesque masks of remarkable execution and of great variety of expression. When, in 1848, a general repair of the bridge was made, its primitive style was carefully preserved, even while suppressing the semicircular stone balconies which had developed themselves above each pier. The bridge was lowered, but the masks of Germain Pilon were reproduced from the original models in the Cluny Museum. It was in 1835, under the Ministry of Richelieu, that the platform of the Pont Neuf was adorned with the statue of Henri IV. The Revolution, which respected nothing, assumed naturally the right to destroy this fine monument, the work of John of Bologna. The existing statue, executed under Louis XVIII., is the work of Baron Lemot. With the Pont Neuf is connected the recollection of a fountain ornamented with a carillon clock, on which was a group in lead, gilt, representing Jesus and the Woman of Samaria, which gave its name to the fountain, once celebrated, but which has now disappeared.

This old stone bridge, which was regarded as so solid a structure as to have given rise to a proverb, "Solide comme le Pont Neuf," was built to replace a wooden bridge of the Mediæval period, several times destroyed and reconstructed, and which was called at successive periods "Pont aux Colombes," "Pont aux Meuniers," and "Pont Marchand."

If we retrace our steps to take the narrow arm of the river, we come successively on the "Pont de la Tournelle," the "Pont de l'Archevêché," the "Pont St. Louis," the "Pont au Double," the "Petit Pont," and the "Pont St. Michel." The first-named of these, formerly a timber bridge, was carried away by a flood in 1637 and again in 1651. Rebuilt in stone in 1654, it was finally rebuilt again in 1847, as it now exists, with six circular arches of unequal width. It unites the Quai de la Tournelle with the Quais de Bethune and d'Orléans. The Pont de l'Archevêché is situated between the quai of that name and the Quai de Montebello. It dates from 1828, and has two abutments and two piers and circular arches. The Pont St. Louis is an iron bridge of one elliptical arch, and connects the Quai aux Fleurs with the Quai Bourbon. The Pont au Double owes its name to the obligation imposed by Louis XIII. on horsemen crossing the bridge to pay a toll of a "double tournois" (an old French coinage). The demolition of the old Hôtel Dieu necessitated the reconstruction of the Pont au Double, which is now an iron bridge, opened in 1882. The Petit Pont was formerly surmounted by houses. It was rebuilt in 1851, and is now a bridge of a single stone arch, uniting the Rue de la Cité with the Quai St. Michel. The Pont St. Michel, built as a prolongation of the Pont au Change, is of the same design (see lithograph); it was built in 1857, replacing a former bridge, which was ornamented with a statue of Louis XIII.

Next to the Pont Neuf, which terminates the Île de la Cité, is the Pont des Arts, with stone abutments and piers carrying nine iron arches. It forms the communication between the Quai du Louvre and the Place de l'Institut, and its name is derived from the Louvre itself, which was formerly called the "Palais des Arts." It is a foot passenger bridge only, and was built in 1802-1804.

The Pont du Carrousel, or des Saintes Pères, was opened to traffic in 1834, and consists of three iron arches formed of tubes of elliptical section. Four statues executed in 1847 by Petitot stand at the ends of the bridge, and symbolise Abundance, Industry, the City of Paris and the Seine. This bridge, which unites the Quai du Louvre with the Quai Voltaire, is one of those with the largest traffic, but it has the serious fault that it is not on the axis of the road on either bank. Accordingly it is destined to be either removed altogether, or to be rebuilt opposite to the arcade of the Louvre called the "Guichets Lefuel."

The "Pont Royal," so named because Louis XIV. bore the expense of its construction, was built in 1685, from the designs of Romain and Mansard. The bridge is composed of five stone arches, and succeeded to a former bridge called the Pont Rouge, which had itself succeeded to a ferry-boat which formerly was the means of communication between the Tuileries and celebrated promenade of the Pré aux Clercs. It was called the "Pont National" in 1792, the "Pont des Tuileries" in 1804, but in spite of political vicissitudes it has finally returned to and preserved its original name.

The "Pont Solferino" dates, of course, from the Italian war, and owes its name to the French victory gained at Solferino. It is a three-arched iron bridge with piers and abutments of masonry, built on the axis of the Rue Solferino.

The "Pont de la Concorde," which connects the Place de la Concorde with the Chamber of Deputies, was the work of the celebrated engineer Peronnet, to whom we also owe the Pont de Neuilly. It was completed in 1793. It consists of five large circular arches in masonry, and has parapets and balusters interrupted by massive pedestals intended for a series of statues. These statues are now in the Cour d'Honneur at Versailles, and there has at various times been talk of replacing them by some other design for completing the decoration of the bridge. With this purpose, for instance, M. Duc was commissioned, fifteen years ago, to make a study for a new design of steles terminating in lamp-brackets and grouped with decorative figures of children. The death of the eminent architect cut short this project, which would probably otherwise have been approved and carried out.

The next bridge, the "Pont des Invalides," has been many times rebuilt. It was demolished first in 1826, and replaced by a suspension bridge which in 1854 was judged to be insufficient for its position, and was succeeded by a stone bridge with four arches. The bridge was considerably injured in 1874 by a flood of the Seine, and extensive repairs to it had then to be carried out. It is one of the few bridges in Paris which possesses sculptural decoration of considerable interest. The piers are decorated with trophies and with two figures carved in stone executed by Dieboldt and Villain, symbolising the victories of the French armies by land and sea.

The next bridge, the "Pont d'Alma," which faces the avenue of the same name, also possesses sculptural decoration in the shape of four figures on the piers, representing a Zouave, a grenadier of the Imperial Guard, an artilleryman, and a chasseur à pied. The two first-named are from the chisel of Dieboldt, the two others are the work of Arnaud. The bridge, finished in 1856, has three elliptical arches. We need not remind the reader how important a part this bridge has played in the Paris International Exhibitions: it is the principal artery connecting the right bank with the Champ de Mars. The next bridge, the Pont d'Jena, was of the same importance in connexion with the exhibition, as it forms the direct communication between the central axis of the Champ de Mars and the Trocadéro, and thus made part of the exhibition territory itself. It was constructed in 1813 and was nearly being destroyed by Blücher in 1815. Louis XVIII. made however great and successful exertions to save it. The four equestrian groups which adorn the parapets date from 1848; they are as follows, a Greek horseman, by Devault; an Arab horseman, by Feuchères; a French horseman, by Préault; and a Roman horseman, by Daumas. Above each pier is an eagle with palms, carved in the stone.

The special situation of the last-named bridge, which became during exhibition time closed except to the visitors to the exhibition, necessitated the construction, in 1878, of a small foot-passenger bridge over the two arms of the Seine separated by the Île des Cygnes. This light iron bridge, called the Pont de Passy, connects the Quai de Grenelle with the Quai de Passy.

The "Pont de Grenelle," which follows next, forms the access to a number of mills in the quartier de Grenelle, from which the bridge takes its name. It was finished in 1827, and consists of two parts separated by the Île des Cygnes, the western extremity of which is now decorated by the replica, on a smaller scale, of Bartholdi's Statue of Liberty. The bridge itself has no kind of artistic character.

With the "Pont-viaduc du Point du Jour" we arrive at the extreme limit of Paris, contiguous, on each bank, to the ditch of the fortifications. The form of the bridge (see lithograph) seems to have been partly suggested by that of many of the ancient Roman aqueducts, such as the Pont du Garde. The bridge serves at once for the passage of the chemin-de-fer centrale and for the military road which runs parallel with the fortifications, and for ordinary vehicles and foot-passengers. The bridge proper is composed of five elliptical stone arches. Above it is the viaduct carrying the railway on a long arcade also of stone, which extends far on to the banks on each side.

This bridge, which has a fine effect as a whole, and makes a dignified architectural termination to the view down the river towards Bas Meudon and Billancourt, has no decoration except some sculptured laurel crowns forming frames to the initials of Napoleon III., under whom it was built in 1866, by two engineers of the municipal service, MM. Villiers and Bassompierre. This bridge, which in its double character may be compared to the high-level bridge at Newcastle-on-Tyne, terminates, not ineffectively, our excursion among the Paris bridges.

Institution of Mechanical Engineers.—The forty-fourth annual report of the Council, presented to the members at the annual general meeting on the 29th ult., shows good progress during the past year. At the end of last year the number of names of all classes on the roll of the Institution was 1,945, as compared with 1,858 at the end of the previous year, showing a net gain of 87. During 1890, there were added to the register 160 names, against which the loss by deceases was 31, and by resignation or removal 42.

RECENT ARCHÆOLOGICAL WORK AT ATHENS.

THE various archæological schools at Athens are now in full session, and lectures and meetings are taking place regularly. Six students have been this year admitted as members of the British school, and, for the first time, one of them is a lady. This number is already greater than that of any of the other three foreign schools, and it probably may be increased before the close of the term. The Director, Mr. Ernest Gardner, returned to Cambridge after Christmas to give a course of lectures in connexion with his college, but he goes back to Athens at Easter. Meanwhile, Mr. Penrose is supplying his place, and his venerable figure is to be seen again on the Acropolis busily continuing the investigations of his earlier years and seeking fresh points by which he can decisively floor, in friendly combat, the brilliant theories of his able antagonist, Dr. Dörpfeld.*

The excavations at Megalopolis were continued during November and December on the site of the Agora, on the opposite side of the river from the theatre which was unearthed last year; but the exceptionally rainy autumn very considerably impeded the progress of the work. Mr. G. F. Richards, Fellow of Hertford College, Oxford, and Craven Student of his University for 1890-91, has been taking the main charge of this portion of the work, and we hope, very shortly, to publish a note from him giving his views on the various points opened up. The complete clearance of the theatre site required by the Greek Government's Inspector-General of Antiquities will not be proceeded with till the spring.

The opening meeting of the school was held on Friday, December 26, when the Director (Mr. Gardner) introduced the subject of the theatre at Megalopolis for the first time to an Athenian audience of the present day, and Mr. Richards discussed the bearing of a Naples relief upon an archaic slab discovered on the Acropolis, probably representing Hermes and the Charites, with a smaller attendant figure. The special interest attached to a paper on the theatre brought together a representative audience of archæologists, numbering about fifty, and including Dr. Dörpfeld. In three lectures delivered by him at the Theatre of Dionysos on December 20, 27, and January 10, Dr. Dörpfeld still maintained, with his usual emphasis and lucidity, his view that the Greek theatre had no stage, and he alluded to the continuous flight of several steps leading down to the orchestra, which has been discovered at the theatre of Megalopolis, and which he had seen last year in a preliminary stage of partial excavation, as less likely to be steps than merely the foundations of a columned front.

Christmas was saddened in archæological circles by the melancholy death of Dr. Henry Schliemann at Naples. No one's loss could have been more keenly felt in Athens, where his kindly and ungrudging hospitality made his house a meeting-place and rallying point for all interested in the history of the past, and where his well-known figure will be largely missed for some time to come. Two days before the news of his death reached Athens, at a meeting of the German School Dr. Dörpfeld was discoursing on Troy and the results of their joint work during last summer, and the prospects of another season's further excavation, little thinking that in a few day's time his would be the mournful duty of accompanying his dead colleague's remains back to the Athens he was never to see again, and that their joint work was finished for ever.

The funeral took place on January 4, and an immense crowd assembled to testify their respect for his memory. A short and impressive funeral service, attended by the King of the Greeks and the Crown Prince, was held in the well-known house in University-street, the King's chaplain officiating. At the grave, M. Kavvadias, Inspector-General of Antiquities, and Dr. Waldstein, spoke of his life and work, and the veteran M. Rangabé, the Nestor of Greek archæologists, and a poet of no mean order, read a Greek ode which he had composed in his honour.

It is believed that Madame Schliemann intends to carry out to completion, as far as she can, what she knows would have been her late husband's wishes with regard to the excavations in progress at Hissarlik.

Dr. Waldstein and Mr. Gardner, at the subsequent meetings of the American and British schools, paid further tributes to Schliemann's memory, the latter alluding with special fitness to the meeting in London, the result of which was to finally establish the early date of his discoveries and their great value to science.

At the second meeting of the British School Mr. Gardner read a paper on "Cypriote Art," and Mr. Loring discoursed on a new and valuable fragment of the Edict of Diocletian, discovered at Megalopolis.

A third meeting was held more recently (January 30), when Mr. Penrose was welcomed back to Athens, and when, amongst other things, he described the way in which the ancients set out the curve of the volute.

At the opening meeting of the American School, Dr. Waldstein lectured on the temple statues from Lycosoura, in Arcadia. The large remains of these, which were discovered recently in the Temple of Despoina at that place, have now been removed to the National Museum at Athens, and Dr. Waldstein was able to illustrate his remarks with casts of the three heads and of the elaborately-carved piece of drapery from one of the figures. He confirmed the view which has been generally received by archæologists, that these statues were the work of Damophon of Messene, and he pointed out how they carried on in marble the tradition of the earlier treatment on the chryselephantine temple statues. Professor Richardson, of Dartmouth College, the annual Director of the American School, also read a paper on one of the inscriptions found in the course of the excavations of the school last year at Platæa. This year the school have obtained permission to excavate at Eretria, in Eubœa, and also on the supposed site of the Eleusinion, between the ancient cities of Psophis and Thelpusa, in Arcadia.

Mr. Gardner before his departure gave several dissertations on early vase-paintings, and Dr. Waldstein is regularly speaking on sculpture in the museums. Dr. Dörpfeld has been recently lecturing at the Stoa of Eumenes, the Odeion of Herodes, and the Asklepieion, and he has also paid a flying visit to Asia Minor, where Dr. Kern and Dr. Von Hiller are conducting interesting excavations on behalf of the Institute at Magnesia on the Maeander, chiefly at the temple of Artemis Leukophryene. M. Foucart has now left Athens, and his successor at the French School, M. Homolle, the excavator of Delos, is expected to enter on his duties as Director this month. It is now thought likely that this school will soon receive definite authority to commence the systematic excavation of Delphi, so there seems a prospect of this important work being at last begun before long.

The clearance of the stoa, west of the Tower of the Winds, in Athens, of which Mr. Aitchison some time ago sent us a sketch plan,* still continues, and many interesting fragments of late sculpture have been found, but there is no particularly new development to report. It seems to have been one of the most important buildings of the Roman Agora, and it is to be hoped that its relation to the structure north of the Horologium and to the stoa of Hadrian will be elucidated by further digging, for which purpose one of the old mosques, now used as the army bakehouse, is to be pulled down.

It is probable that interesting facts relating to the Greek Agora will be brought to light during the works now proceeding in connexion with the extension of the Piræus-Athens railway to the Place de la Concorde. The line is to be continued in a cutting from the present terminus to the foot of Athena-street, and from thence by a tunnel under that street till it reaches the square. It must therefore cut the line of the old street leading from the Dipylon to the Agora, and probably also part of one of the porticoes described by Pausanias.

The coming year seems to promise a continuance of interesting discoveries; at any rate, with so much archæological work projected, it can hardly be unfruitful in results.

* As is well known, Mr. Penrose quite disagrees with Dr. Dorpfeld's restoration of the old Athena temple on the Acropolis,

* See *Builder*, November 22, 1890.

NOTES.

CONTESTS between federated employers and federated employés promise to be frequent and severe. The latter have voluntarily placed themselves under an iron hand, and the freedom for which their political friends are so clamorous, they seem to be bent on thrusting from them,—this, too, in that which is of the most vital importance to them,—their labour. In the strike which commenced last week at Cardiff we have the spectacle of the much-abused capitalist holding out for freedom, and the working-man fighting hard against it. Only a short time ago, the streets of London were daily paraded by bands of unemployed workmen carrying banners inscribed, "We demand the right to labour," — while the Cardiff dockers are claiming a right to prevent any man from working who has not signed away his freedom in the same way as they themselves have done. They are acting in obedience to the mandate of their self-imposed dictators, and hundreds of workers in no way connected with their organisation are in danger of being thrown out of employment through the cessation of work at the docks. The few coal-tippers who were the first to strike had absolutely no grievance whatever, ceasing work in accordance with orders received from their headquarters, simply because a ship they were about to load was not manned by a unionist crew; and resistance on the part of the officials to this unreasonable proceeding was the signal for a general outbreak. It is a significant fact that some of the older trade-unionists are actively engaged in endeavouring to arrest the progress of the strike,—evidently recognising the indefensible nature of the tyrannical principle underlying it. The dockers, both at Cardiff and at other ports, are being told by their leaders that the tyranny is on the other side, the way being thus prepared for enlarging the area of the strike.

JUDGMENT was delivered last week by the Railway Commissioners in a case of considerable importance, involving a decision upon the question of group rates. This, as the term implies, is a system under which the railway charges to or from a group of places situated in the same district are rendered uniform; and, so long as an undue preference is not created, the practice is legalised by the Act of 1888. In the case under notice, however,—the North Lonsdale Iron and Steel Co. *v.* Furness Railway and others,—the complainants argued that they were placed at a disadvantage through the operation of certain group rates, some of their competitors situated at a much greater distance from the markets than the North Lonsdale Works being charged just the same rates as themselves for the conveyance of material. The complaint had reference to both inward and outward traffic, and they obtained a favourable judgment in respect of pig iron forwarded, but the Commissioners were of opinion that no interference was called for in the other cases (coke and iron ore). The group rates for the pig iron traffic were condemned in consequence of places twenty miles from the North Lonsdale Works (from which similar traffic was carried) being included in the same group; it being held that this was unreasonable, and that the more distant works were given an undue preference. It is noticeable, however, that the Commissioners

did not intimate at what distance the line should be drawn, and it therefore follows that the whole question will have to be fought over again when any one considers himself prejudiced in a similar manner, and the favoured competitor is not so far distant as in this instance. Intending litigants who may look to this case for a precedent, should not fail to notice how the court dealt with the important question of costs, as the decision was rather peculiar, the complainants having to pay all their own expenses and half the costs on the other side as well. This was in consequence of their failure to establish their case on two of the three points brought forward, and the decision has been the subject of some adverse criticism. It will certainly discourage traders from coming before the Court unless they have a very strong case, as it is generally no light matter to be called upon to pay even a part of a railway company's costs in an action of this nature. The explanation of the Commissioners' ruling may probably be found in the fact that of the total estimated yearly overcharge (10,602*l.*) just about a fourth (2,500*l.*) was placed to the account of the traffic upon which the complainants succeeded, and the railway company were consequently condemned in a fourth part of the costs only.

THE case of Butler *v.* Birnbaum, heard this week before Mr. Justice Stephen, though it is not concerned with the building trades, is of importance to all employés, as it shows that damages cannot be recovered from the employers for injuries sustained in carrying on the ordinary work of the firm, merely on the plea that some superior kind of plant or machinery would have rendered such injury less probable. In other words, a firm is not under any legal obligation to have the best plant possible. In this rather peculiar case the plaintiff had unquestionably suffered severely in health from the fumes of chemicals employed in a process in waterproof manufacturing, and evidence was brought to show that another firm employed a machine for the same purpose, in which there was a special cover for the trough in which the chemicals were placed, to shut in the fumes except during the time of use; also that the machine used by the defendants, owing to mechanical defects, obliged the men to come into closer contact with the chemicals in endeavouring to counteract these defects while the machine was working. The case, as the learned Judge said, was a very hard one for the plaintiff, and he wished the law could give him compensation; but as there was no legal obligation on any manufacturer to use the best machinery in existence, the plaintiff must be non-suited.

THE remaining drawings submitted in the competition for the Municipal Lodging-house have been exhibited during this week at the offices of the County Council. Want of space prevents full reference to all the designs, but the quality of the work, with one or two exceptions, shows a keen desire to successfully grapple with the difficulties of a problem which has not previously received much attention, at any rate in this metropolis. Messrs. Florence & Satchell's drawings show an entrance in the centre of the Parker-street frontage, and a day-room on the right; the rest of the ground-floor and the upper floors are devoted to dormitories, for which ample lavatory accommodation is provided on each floor. The line of building is confined to a parallelogram, and does not encroach upon the recesses, and two areas are provided in the centre of the block. The elevations are kept studiously free from ornament, but are pleasantly treated. Messrs. Crickmay & Son submit some very creditable designs, which contrast favourably with many of their neighbours. It is to be feared that the question of cost has been prejudicial to their occupation of a better place in the competition. The plan is H-shaped, and is simple in arrangement; the entrance is placed in the centre, and on either side are office and shop. Parallel blocks at right-angles to the front contain on the ground-floor dining and day rooms. A staircase occupies a central position, and on each landing extensive lavatory accommodation is provided for the dormitories occupying the upper floors. The elevations are certainly some of the most pleasing to be seen in the exhibition, but the respectability of the exterior would have, we fear, a deterrent rather than an inviting effect upon the class for whom this accommodation is intended. Messrs. Quilter & Wheelhouse and Mr. Boyes, amongst others, have submitted carefully-thought-out designs. Various opinions appear to exist amongst the competitors as to the requirements of the future inmates, and some of the elaborate laundry and lavatory arrangements seem to us to be much in excess of the requirements or inclinations of the people for whom this accommodation is intended. The ironing-rooms and other conveniences, provided by some competitors, suggest a desire on the inmates' part for clean linen, whereas we fear that in many cases there will be an absence of linen. We heartily wish this scheme success, and should the multiplication of these houses tend to obliterate the lodging-houses which are little better than plague-spots dotted over the Metropolis, a great sanitary gain would be recorded. The class for which this accommodation is intended, however, is essentially shiftless and thriftless, and we much fear that the superior accommodation and cleanliness of these new houses,—connected, as it must be, with a certain amount of official supervision,—will fail to attract the right class from the smaller houses supervised by a "deputy" who is seldom much superior to themselves.

MR. HINGLEY, M.P., has introduced a Bill to prevent gambling in pig-iron, which has of late become so notorious and so harmful to those who have to purchase the article for manufacturing purposes. The Bill declares that all contracts are void unless the contract shall specify a document to identify the actual material sold. It is probable that the ingenuity of those who gamble in this material will find some way out of the net which the Legislature will probably spread round them. But if the Bill passes into law and is at all successful, we do not see any sound reason why its scope should not be extended, so as to cover gambling in other materials. It is unquestionable that such gambling exists, and is not only harmful to those who engage in it, but, indirectly, also to those who have occasion to make use of the material which is the subject-matter of wagering contracts.

A SHORT but very pointed paper was read by Dr. Louis Parkes on Wednesday evening at the Parkes Museum, on "Model Lodging Houses and Overcrowding on Space," the main object of which was to urge, what every one is beginning to see only too clearly now, that overcrowding vertically is as dangerous to health as overcrowding laterally. He concluded with a somewhat longwinded resolution, the purport of which was that the London County Council be memorialised to include, in the Bill they propose to promote for the consolidation of existing sanitary Acts, a clause giving power to make by-laws for enforcing the provision of adequate open area around buildings; a resolution which was carried unanimously. Dr. Poore, in an admirable speech, after observing that the possibility of carrying houses to an immense height depended entirely on water-supply under pressure, strongly supported the objects of the paper, with which we are quite in accord in the main, though some of the statements and arguments heard during the evening will bear a note of interrogation. When Dr. Poore, for instance, condemns wholesale all rooms beneath the level of the street, we may ask him whether, in such a street as Harley-street, for instance, he would think it a sanitary improvement to raise the kitchens entirely above the ground, and raise the whole height of the houses from the street level one story? We also very much question Dr. Parkes's rather sensational diagram showing the section of houses and courts as he avers they may be built under the Metropolitan Building Act. It is quite true that the clause providing a minimum area at the side or back of every inhabited house makes no account of the height of the house, and that the provision is very insufficient in the case of a building of four or five stories; but it is not in accordance with the Act that three five-storied blocks of houses can be built with a 10 ft. wide court between them. The Building Act is in many cases badly worded, and does not say clearly what it means to say, but the provision for open space in the rear of a building obviously refers to houses facing a street; otherwise why were the words "in the rear" used? It is loosely worded, no doubt, but that is the intention, and therefore Dr. Parkes's diagram was rather a misleading one. The suggestion that we must come to cheap railways and outlying villages around London was much applauded, but it is not so easy of realisation as some enthusiasts seem to think. If we go to the very root of the matter, we shall perhaps come to see that the thoughtless pressing into London from all parts of the country is the evil that will have to be stopped. London is itself one great phenomenon of overcrowding, and either a natural reaction, or legislation, will have to put a check on it sooner or later.

SO many examples of public buildings have, within the last few years, sprung up in London, in which the use of marbles forms a considerable feature in the interior decoration, that it is not surprising to find the same materials lavishly used in the latest addition to the long list of London theatres. The vestibule, staircase, and foyer on the royal-tier stall level have been treated generally in much cooler tones than the auditorium itself. The walls of the staircase are of Derbyshire alabaster and the columns of a delicate green marble, while the lines of balustrade are more strongly marked in handrail and plinth by the use of "grand antique." The ceilings throughout this staircase are, like the panels of part of the auditorium, delicately painted with arabesques and figure-subjects on a pale green ground. As a contrast to the colder tones of the entrance and stairs, the columns leading to the foyer of the tier-stalls are of beautiful pink "Algerian" marble, the dado being of still richer rouge jasper. The ceilings are rich in plaster decoration relieved by gold, and the walls here, as in the vestibule below, are of the Pavonazza marble of Italy. The richness of the theatre proper is mainly confined to the proscenium arch, which is ornamented with gold and colour, strong lines of blue being introduced in the upper part, and on the spandrels of the double row of circular panels. The space immediately above the proscenium opening is occupied by a large figure subject gilded, while the opening itself is lined with grand antique, cippolino, and Italian Pavonazza, some panels of Mexican onyx being introduced at the side. The roof of the auditorium, which for acoustic reasons has been made to rake upwards from the proscenium, has a rich treatment of figures and arabesques, the cooler tones being somewhat sharply contrasted with the deep blue ground of some of the panels and the dark red radiating and outer lines of the octagon, in which form this central feature has been designed. The walls of the auditorium itself are treated in a pale green gradually strengthening in tone towards the bottom, the balcony fronts in every case being of a similar tint, but picked out with gold, with cupids at intervals holding the electric lights. There is also some very delicate hand-painted work on the columns of the boxes, which are upholstered in yellow. The best general view of the interior is undoubtedly from the middle of the dress circle, besides being, as in fact it generally is, the most advantageous portion of the house for seeing and hearing the performance.

ON the 4th inst. Mr. Horatio Daniell read a paper before the Civil and Mechanical Engineers' Society, at Westminster, on the Jerome steamship shaft, which is composed of steel wires of small diameter, bound together in such a manner as to give them sufficient strength to resist both bending and torsional stresses. A shaft of this description is claimed to possess many advantages over the ordinary solid shaft now in use, it being not only less expensive, but, for the same weight of material, considerably stronger. In building up such a shaft, say 15 in. diameter, it would be constructed in lengths of 20 ft., the ends of each section having couplings attached for connecting them together. Collars for bearings would be fixed between the couplings where required. Each length would consist of some 5,000 wires, and could be formed of "seven bunches of wires of ⅝ in. diameter, one 5 in. bunch in the centre as a core, and surrounded by six similar bunches, the whole making the larger 15-in. section." It is proposed to weld the wires together which form one of these bunches, and at the end of each section the seven bunches would be welded into a solid end. The tensional strength of each wire used would be 1,500 lb., and Mr. Daniell points out that, as it is possible to actually test each wire separately, much greater reliance can be placed in a shaft thus tested than on an ordinary solid one, in which it is often very difficult to discover if a flaw exists. Very considerable bending stresses are liable to occur in a steamship shaft, due to the straining of the hull, causing the bearings of the shaft to be no longer in a truly straight line, as well as from the unequal resistance the propeller meets with in rough weather, due to the pitching of the ship, and a shaft, having only a portion of the improvements claimed for the one under consideration, would be most valuable. There are, however, in our opinion, many practical difficulties to be overcome in the construction of wire shafts for steamships, and it is impossible to say, without making experiments on a large scale, whether they are destined to supersede those now in use.

THE continued excavations which are being made for the construction of new buildings in the centre of Florence have brought to light many important ruins of edifices of the Roman epoch, which belong to the monuments which adorned the ancient Forum and the Capitolium. Just recently, under the Mediæval palace Della Luna, walls of about 1 mètres in thickness have been discovered, supposed to have belonged to the Temple of Jupiter, which, in imitation of Rome, was built also in the Capitolium of Florence, and the memory of which has been preserved until the present day in the denomination of the church of S. Maria "in Campidoglio." Besides the above-mentioned walls, fragments of mosaic, and sculptures in marble and stone, were found. On the site of the church, now demolished, of S. Donato dei Vecchietti, have been recognised traces of remains of ancient baths. In Via Calimara, at the depth of 3·80 mètres below the modern level, has been found a base of Luni marble, with cornices on three sides, ·37 mètres high, ·32m. wide, and of ·22m., which bears in front, in characters of the first or second Christian century, a mutilated inscription, in which can be read the words, "Genio Coloniae Florentiae." On the upper part are to be seen the holes for the cramps to hold the statue. Already, by other inscriptions, it was known that Florence had been a Roman colony, but the confirmation now given by the new discovery is worthy of remark. The works of the new locality, which will soon become the Museum of the Opera del Duomo, are almost terminated. In the large gallery has been already placed all the architectural and decorative work and bas-reliefs of Lucca della Robbia and Donatello, which ornamented the ancient pulpits of the Florentine Cathedral, which sculptures were formerly in the National Museum. In the new Museum various other objects belonging to the Opera del Duomo will be carefully exposed, terra-cotta, arms, capitals, and other architectural fragments, and a great many Mediæval ecclesiastical objects of artistic value, among them, above all, the celebrated altar, of massive silver, of St. John the Baptist, and which in past times, for only eight days in the year, was exposed in the Florentine baptistery. The director of the works of the new Museum is the Prof. Arch. Sig. Luigi del Moro.

WE have received from Mr. F. Massie, the Engineer, Surveyor, and Waterworks Manager to the Wakefield Union Rural Sanitary Authority, a copy of his annual report, which tends to show that, unlike some Rural Sanitary Authorities which we have occasion now and then to refer to, the Wakefield Union is in earnest in endeavouring to improve the drainage and water-supply of the district within its area. The report records a scheme for water-supply to the townships of Crofton and Walton, for which borrowing powers have already been granted, and one for another district for which similar powers have been asked for; seven or eight new drainage schemes for different districts are under consideration, or already in progress; and the surveyor urges that, as he had found on entering on his duties that there was considerable laxity as to complying with the by-laws in the submittal of plans, &c., the existing by-laws should be made uniform throughout the district, printed forms of the requirements prepared, and compliance with them enforced. Altogether, as far as the report affords evidence, we may congratulate the Wakefield Union Authority on their activity in the right path and on the efficiency and zeal of their surveyor.

THE exhibition of Miss Kate Greenaway's drawings at the Society of Fine Arts leads to the conclusion that a good deal of their charm arises from their delicate colour harmony, combined with the old-fashioned naivete of style and costume which distinguishes them. Seeing a number of them together one cannot but recognise that there is a sameness about them, as well as a certain stiffness of drawing in many cases. In fact some of them, such as "Puss in the Corner" (121) represent types of children as conventional and as unlike real children as some of those in Blake's "Songs of Innocence." Others, such as "Girl with Baby" (126, from "A Day in a Child's Life") have more every-day and human interest and expression. In a decorative sense the whole series is charming. One or two larger water-colour drawings, such as "Far-away Thoughts" (158), show that the artist has higher powers than are expended in the production of her children's picture-book series, when she chooses to exercise them. Mr. Hugh Thompson's series of pen and ink illustrations to the Vicar of Wakefield, in the same room, exhibit a remarkable degree of humour and perception of character, though we think that, in this and other works of the same class, the artist, in his desire to revive a realistic representation of the middle and lower classes of a century back has exaggerated the vulgarity and coarseness of his types of farmers and squires and farmers' men, &c. His conception of the vicar is excellent, however.

THE HARLEIAN SOCIETY.—The annual meeting of the members of this Society was held at 140, Wardour-street, W., on the 4th inst., Mr. G. E. Cokayne, Norroy King of Arms, in the chair. The accounts of the Society showed a marked increase in the interest taken in genealogical pursuits, to which the Society's publications are devoted, and its prosperity was considered in every way satisfactory. The publications issued during the past year were the "Marriage Licences issued by the Vicar-General of the Archbishop of Canterbury, 1679—1694," in two volumes; and the "Registers of St. George's Chapel, Mayfair, 1740—1754." "The Visitations of Norfolk," and "The Register of the Parish Church of Kensington," are now in the press, and other volumes are in preparation.

BYZANTINE ARCHITECTURE.*

BY PROFESSOR AITCHISON.

Neo-Byzantine.

THE buildings of Justinian's days must be looked on as the culminating point of the Byzantine style, and the most magnificent memorials of his reign; for I do not know of what value his code, pandects, and institutes are in the present day, but law students have to be examined in them.

Many circumstances contributed to this. We suppose he had the advantage of the architects brought up in the schools founded by Constantine, and of the skill which had accrued to architects by the number of public buildings erected at Constantinople; for when Byzantine became the capital of the empire there was not only Constantine's palace to build, but the public offices, places of amusement, and palaces of the Senators, and, in consequence of the empire having become Christian, innumerable churches and monasteries. It is possible that much of the splendid materials stripped from every province of the empire by Constantine had not been used up; Justinian inherited thirteen millions from his predecessor; the arms of his generals had been successful, so he had the revenues of a good part of the old Roman Empire at his disposal,—every temple had been plundered and its revenues sequestered, and every act of extortion was used to fill his treasury. Had it not been for his cowardice and foolishness in constantly paying heavy subsidies to the barbarians, which drained his coffers, and served only to invite fresh inroads, the expenditure on his buildings would have scarcely been felt, for they were a perennial source of income, as they still are, to the Turkish Empire.

After his time, every sort of disaster fell upon the Empire, the West was permanently wrested from it, and the constantly-increasing conquests of the Moslem were diminishing its extent, both in the East and in the West. Whatever merits subsequent buildings may have, nothing equal to Sta. Sophia is to be found. The Church of the Sti. Apostoli at Constantinople was built by Constantine, rebuilt by Justinian, and ultimately destroyed by Mohamed the Second for his own mosque. In Procopius, there are passages which may lead us to believe that neither the drum nor the Latin Cross were after inventions, and, if this be true, we can hardly take either feature as a proof of Neo-Byzantine.

Procopius says (Procopius, Lib. 1, cap. 4):—"In ancient times there was one church at Byzantium dedicated to all the Apostles, but through length of time it had become ruinous, and seemed not likely to stand much longer. Justinian took this entirely down, and was careful not only to rebuild it, but to render it more admirable, both in size and beauty; he carried out his intention in the following manner. Two lines were drawn in the form of a cross, joining one another in the middle, the upright one pointing to the rising and setting sun, and the other cross line towards the north and the south wind. These were surrounded by a circuit of walls, and within by columns placed both above and below; at the crossing of the two straight lines, that is, about the middle point of them, there is a place set apart, which may not be entered except by the priests, and which is, consequently, termed the sanctuary. The transepts which lie on each side of this, about the cross line, are of equal length; but that part of the upright line towards the setting sun is built so much longer than the other part as to form the figure of the cross. That part of the roof which is above the sanctuary is constructed like the middle part of the Church of Sophia, except that it yields to it in size; for the four arches are suspended, and connected with one another in the same fashion, *the circular building standing above them is pierced with windows*, and the spherical dome which overarches it seems to be suspended in the air, and not to stand upon a firm base, although it is perfectly secure.

In this manner the middle part of the roof is built: now, the roof over the four limbs of the church is constructed of the same size as that which I have described over the middle, with this one exception, that the wall underneath the spherical part is not pierced with windows. When he had completed the building of this

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sanctuary, the Apostles made it evident to all that they were pleased and thoroughly delighted with the honour paid them by the Emperor." ("Procopius," Lib I., cap. 4.) In this church Constantine and many of his successors were buried. Ducange says, "All the Christian Emperors."

I wish I could give you characteristic specimens of churches from the days of Justinian to the end of the Byzantine Empire, arranged according to date, so that I could point out the tendencies that culminated in Neo-Byzantine, and follow them consecutively to the end, but there are no accurately-published data to go upon. We have the school at Athens pursuing this subject, and several of our English antiquaries are devoting themselves to it. I may mention Professor Hayter Lewis, the Rev. Canon Curtis, and Dr. Freshfield, and it is probable that many other English antiquaries are doing the same, as well as those of France, Germany, Russia, and Greece. Whenever a sufficient number of examples are accurately drawn, and all the requisite information has been got from books and MSS., we shall be able to classify the churches and other buildings according to their centuries, just as we now can Gothic buildings. The dates of many Roman buildings have been ascertained from the stamps on the bricks, which shew us at least that the buildings were not erected before the Emperor's accession in which the bricks were made.

In every style that was once alive, and that was not ossified by religious conservatism, there must have been in almost every building some peculiarity of plan, construction, or adornment at each successive period that, if sufficiently studied, would reveal to us its approximate date; but these indications must be studied with due regard to local peculiarities, and to the architectural schools that have produced them.

At present we must, to a great extent, be content with guesswork, and an important and interesting chapter of architectural history must have most of its pages left blank. Tracing the differences in plan, construction, and æsthetic treatment, of a long chronological succession of buildings of the same style, is attractive enough, and marking the various internal and external causes of variation is profoundly interesting, but without proper data it can only lead to false theories. In this case the influence of Byzantine architecture on Saracenic, Romanesque, Russian, and Gothic architecture has been very great—in fact, we may say that up to a certain period Saracenic is Byzantine; so there is all the more reason to encourage architects and antiquaries in their efforts to complete the subject and to solve the problems. The reasons for this neglect are not far to seek: the style itself was till lately looked upon with contempt. Huge gaps have been made in the sequence of buildings by their destruction. The rise of Saracenic architecture did, in some cases, alter the forms of existing buildings, and before and since that epoch successive alterations and rebuildings have left us uncertain as to what is original, what was produced as a colourable copy of the old, and what was entirely new; while the loss of records, the changes of name, and their re-dedication by the Mussulmans have rendered it difficult or impossible to identify them. Almost insuperable difficulties existed, and to some extent still exist, in obtaining the requisite knowledge of the subject; many examples are in parts not easy to get at, and when got at the country certainly *was* in so lawless a condition, that nothing could be done; violent Moslem fanaticism not only prevented the delineation of buildings, but even prevented their interiors from being seen, and some fanaticism in that direction does even now exist. Ware, in his book on vaults, published in 1822, tells us, in a humorous way, that if you want to get the particulars of Sta. Sophia you must turn Mussulman. It requires a good Greek scholar to get some of the facts required from ancient writings, for I believe many of the Byzantine authors and MSS. are not translated; to follow it up locally you want to be a master of modern Greek and Turkish at least; besides, to many persons Byzantine history is not attractive, for, with some notable exceptions, it is the record of turbulent, cowardly, and venal slaves, and of astute or worthless despots or their creatures, as destitute of courage as of humanity, playing savages against one another, while the most desperate maxims of Machiavelli were daily put into practice. Shakespeare's play of "Titus Andronicus" will give you some idea of the Byzantine Court. It is one of the episodes of history in which hypocrisy, ingratitude, treachery, cowardice, corruption, and bestial vice is pourtrayed in blood, and accompanied by the groans of an oppressed people and the shrieks of the tortured.

Comparatively little has been published on Byzantine architecture, considering the vast areas over which it extended, and the length of time it endured; we have, however, the magnificent work of Salzenberg on Sta. Sophia, on five other churches at Constantinople, and on three in Asia, but, unfortunately, the text is in German; if some German scholar would publish the text in English, it would be a great boon to the profession.

Couchard published a book on some of the Byzantine churches in Greece, and Labarte on the Imperial Palace at Constantinople, Paspati on Constantinople, Texier and Pullan on Byzantine architecture, mainly on the churches at Salonica and Trebizond; Texier on Persia and Armenia, Verneilh on Byzantine architecture in France; there is also a magnificent work on St. Mark's, published by Onigania; the Marquis de Vogüe on Central Syria, Mr. A. J. Butler on the ancient Coptic churches of Egypt, and M. Choisy's great work on the art of building amongst the Byzantines, and within the last few years a new edition of an interesting little book by M. C. Bayet has been published on Byzantine art; but there are many examples contained in works on other subjects; in Hubsch, for example, on "Christian Architecture from Constantine to Charlemagne," in Isabelle's "Round Buildings and Domes," and in Mr. T. G. Jackson's "Dalmatia," but I know of no comprehensive work on the Byzantine churches of Greece, Asia Minor, Armenia, Mesopotamia, and North Africa.

I personally feel towards the writers on Byzantine Architecture as Constantine did towards the bishops, he was ready to throw his cloak over their frailties; so I will only say that you must not be too sure that what is published is correct.

I do not know whether I made it clear that the buildings erected in Constantine's days were purely Roman, saving some little peculiarities that may have been introduced by the foreign architects and workmen, that the shape of the churches with the exception of a few circular and polygonal ones was that of the Roman Basilica. During the time that elapsed between Constantine and Justinian, the Christian church had been trying to settle the most convenient form for its ritual, and this form appears to have been pretty well agreed on by Justinian's time; the Basilica seems mostly to have been given up, and the Eastern church had more or less settled on a square for its nave, and on a dome for its covering, but the churches were often lengthened not only by the Bema, but by other spaces to the East and West, so that in these cases they did not differ very materially in their proportions from a Basilica. When Byzantine architects had fitted a dome to a square by means of spherical pendentives, this dome and these pendentives had to be abutted, and this was done by means of other domes, half domes, or wide barrel vaults. The Church of St. Irene, built in Constantine's days, as an appendix to Sta. Sophia, was doubtless a basilica of the common form like Eski Djouma and St. Demetrius at Salonica, or St. John's studios at Constantinople. Ducange says it was a triple church, dedicated to the Virgin, to St. Theodora, not the Empress, I presume, and to St. Irene; after the fire in Justinian's days it was rebuilt, and afterwards Ducange says it was shaken by an earthquake in the days of Leo III., the Isaurian (717-741); it is now a Turkish armoury, and, although I used what influence I had, I was unable to get into it. The present building was probably of Leo the Isaurian's time (717-741), for we see that a new system has been adopted to keep the old basilica form, and to dome it; three pairs of piers were used after the manner of those at St. Demetrius at Salonica, but bigger and arched over to other piers in the external wall. The columns had been replaced by the piers of an arcade, and over the centre of the nave was a dome about 46 ft. in diameter, abutted westwards by an oval dome, eastward by a barrel vault, and the half dome of the apse, north and south by barrel vaults. The central dome has a tall drum, pierced with twenty windows, below the dome, thus forming a lantern. From the days of Constantine to those of Justinian, the dome windows, in the churches that are left, were mostly in the dome itself; and the drum is one, perhaps the chief, sign of the Neo-Byzantine, always supposing that the Sti. Apostoli had no drum. If S. Irene was still dedicated to the three saints, it had no apses to the aisles, probably following the form of the original basilica. The nave, from the face of the narthex to the end of the apse, is three times the diameter of the central dome, whilst Sta. Sophia at Constantinople, is only two and a half times. I may as well take Sta. Sophia of Salonica, or Salonicco as it is now written, as my next example. This is the church that suffered in the late fire, and is of course now a mosque. It was empty, and mosques have been traditional places of security and of refuge. The unfortunate people who were burnt out in a section of the town adjoining it, carried all their spare clothes, carpets, deeds, valuables, and small articles of furniture, into the mosque, which was separated by its garden and by a street from the fire; the wind was high and the mosque windowless; the sparks and embers flying in set fire to the combustible things stowed there. The flames ignited the wooden roofs of the portico, and of the upper galleries, which were all destroyed, and the deeds of the Mosque as well. Some of the Verd antique columns of the nave were shattered (a piece that scaled off one of the nave columns is exhibited) and the leaves of some of the white marble capitals on the opposite side were calcined; some of these capitals have their leaves represented as bent by the wind, an idea that excited Mr. Ruskin's enthusiasm when he saw those at St. Mark's, though this form of enrichment seems to have been a stock pattern; still the sculptor who originally observed this effect of the wind on leaves, and was able to represent it in so architectural a way, deserves all the praise that can be bestowed on him; later civilised ages can always refine if they cannot invent. The brickwork appears to have suffered no damage, though in many places the plaster was brought off, so this Mosque may give us a lesson of the advantages of using burnt brick for public monuments.

Texier and Pullan supposed that this cathedral was of the time of Justinian, and was built by Anthemius; but I believe it was of later date, for it has three apses at the east end, a short drum to the dome, and the north and south arcades are set back, so as to get a wide barrel vault to abut the dome. If it were designed by Anthemius, we may reasonably suppose it was so designed before Sta. Sophia at Constantinople, for the following reasons. We can hardly believe that Justinian, who was so anxious to get Sta. Sophia done, that he had a room built to see the progress of the work, would have spared Anthemius, and Anthemius is said to have died in the second year after the great Sta. Sophia was begun, viz., in 534, yet it could not have been built before, for the extra abutment to the dome was to correct the weakness discovered at Sta. Sophia.

The drum is a square one, pierced with three windows on each side below the springing of the dome

When Sta. Sophia at Constantinople had once been built, it was naturally taken as a model for other large churches or cathedrals. All the principal mosques at Constantinople built by the Turks are from the model of Sta. Sophia,—with modifications, of course. Sta. Sophia at Salonica is a striking cathedral inside. It looks vast as compared with most of the other churches there, with the exception of St. George, and this scarcely has the look of a Christian church, but when I saw it I had not seen the original, nor the great Turkish mosques. The idea is a fine one, if not carried out on too small a scale. This church is now merely whitewashed, so there is nothing but the conception to captivate you,—there is nothing to be set down to the impression produced by gorgeous decoration; so you may bear in mind that a grand idea properly carried out produces a grand effect. Externally it has a Turkish porch extending across its front, and inside a narthex, rather over 18 ft. wide and 104 ft. long. The aisles are about 18 ft. wide and 86 ft. long, and must, I suppose, have been separated from the narthex by curtains. The length of the nave from the narthex to the end of the apse is 105 ft., and its width is only 33 ft., but it has two square recesses at the sides of the dome, making it there 56 ft., while the nave at Sta. Sophia at Constantinople is 265 ft. long by 110 ft. wide. You see, by comparing the plans, that it is without the two

grand hemicycles, that the bema is much deeper, that the screen walls are carried back instead of being in line with the face of the dome piers, and you also see the two chapels or vestries on either side of the bema have an apse to each. Above, the gallery goes over the narthex as well as the aisles, as at the great Sta. Sophia. At one time this cathedral was sumptuous with marble linings and mosaic, but the marble linings have disappeared, and the mosaic is now obscured by whitewash and by the smoke from the fire. The fire has also revealed an undercoat of plastering in the narthex and aisles on which the remnants of frescoed figures and ornament are to be seen. The cathedral externally has a more architectural appearance than the great Sta. Sophia. The Turkish portico, consisting of an arcade of nine columns, has doubtless been a great improvement to its appearance; above this is a narrow strip of wall, the front of the gallery over the narthex, with twelve small round-headed windows in it, two of which are blanks. These small windows give a scale to the building, and make it look larger than it is; above them is a still narrower strip of wall, with one window in the middle. The drum of the dome is square, and is pierced by three large round-headed windows, which give light to the windows of the internal circular drum. Above this is a strip of the circular dome, covered with lead, and from this to the square wall below are flying buttresses; above, there is the segmental cap of the dome, covered with lead. The Turks have improved the appearance of the dome by the addition of a little dome-shaped piece, from the centre of which springs a finial.

In small churches there was an inclination to make the central dome stand on four monolithic marble columns, as may be seen at St. Bardias, at Salonica. It is called so in Texier and Pullan, but was dedicated to the Virgin in the year 1028 by Christopher Bardias and his wife and family. It has the three apses, and an octagonal drum to the central dome, with windows in it of two tiers; but in this case the dome is not seen externally, the drum or central tower has a hipped roof, it has two later domes over the gallery above the narthex. St. Elias, at Salonica, has a peculiar plan; it is trefoil with a straight end,—the three foils form the bema and the two transepts; it is without aisles, but has two tiny chapels with apses in the huge piers of the bema, and a large narthex and gallery over. The narthex is vaulted on four columns. It is about 25 ft. by 31 ft. inside. From the appearance of the church I should judge it to be late.

I will just mention the Church of the Monastery in the Country at Constantinople (*Μονὴ τῆς Χώρας*), because Ducange says the original church was built by Justinian. The Rev. Canon Curtis says it was built before Constantine's time, *i.e.*, over the bodies of St. Babylus and two other martyrs, who suffered under Decius in 250; and Fergusson believes that its front gave the idea of the front of St. Mark's at Venice; though, for the matter of that, many Byzantine churches have similar features,—one side of St. Bardias, for example.

The present church was either rebuilt or restored in the reign of Andronicus Palæologus the elder (1283–1295). It now consists of the central church with another adjoining it on the north side, and a two-storied building on the south, and is celebrated for the beauty of its decoration. The narthex and exonarthex have the remains of some of the most beautiful mosaics that remain to us. The north church has been adorned with figure-painting in fresco; the central church has its walls encrusted with lovely marbles, pietra dura, and geometrical mosaic in gold and colours. It is adorned with some of the most beautiful acanthus work carved in white marble I have ever seen; in it was kept the portrait of the Virgin, attributed to St. Luke. I believe the marble doors, a drawing of which is exhibited, once covered this portrait. A robe of the Virgin, which was carried in procession round the walls of the city when it was threatened, was alternately kept in this church and the Hodegetria. A sketch-plan of the church, to a small scale, partly from memory, is exhibited, as the mollah objected to my taking a plan.

From Justinian's day there seems to have been a strongly-marked inclination to arrange churches on the following plan:—A square was set out as big as you could afford to build your central dome, with columns or piers at the angles; from the centre of this square half circles were turned, and the extremities of these formed the external lines of the aisles and of the east and west arms of the cross; to the east there was a deep space beyond, with the apse at the end forming the bema; the four squares formed by the aisles, and the two similar passages crossing east and west, round the square of the central dome, were ceiled with small domes level with the other vaulting. The aisles were carried as far as the square part of the bema, and then had an apse to each, generally projecting externally. A narthex was added at the west end, or a narthex and exonarthex. As time went on, these subsidiary little domes were carried up on drums to group with the central dome, and the narthex also sprouted into domes. This plan seemed to take the fancy of the Westerns as well, for I found that St. Mary-in-the-Fields, at Piacenza, built in Renaissance days, was a complete example of this method, only the central dome was veiled externally by square erections; the four little domes had drums, and showed externally.

When more room was wanted in the church than the spaces I have described, another bay was added at the west, or two additional aisles, or four chapels were put outside the first aisles. The arrangement before mentioned, occasionally with slight modifications, may be seen at St. Theodore, the Pantocrator, the Theotocos at Constantinople, and at St. Bardias, at Thessalonica; Sta. Sophia, at Trebizond, is an imperfect specimen; at the old Cathedral, St. Theodore, and the Kapnikarea, at Athens.

In the case of St. Nicodemus at Athens, at the church of the Monastery at Daphne, near the Bay of Eleusis, and at St. Nicholas at Mistra in the Morea, the central domes come up to the bema, the arms of the cross are made much narrower than the diameter of the dome, and there are additional aisles or chapels on both sides; the two first of these churches have squinches or conchs instead of pendentives. St. Mark's at Venice is somewhat after the fashion of Procopius' description of the Sti. Apostoli at Constantinople, only St. Mark's is said to have been built in 1043, in the reign of Constantine the Tenth (Monomachus, Finlay calls him, the Ninth), and covered in 1071, in the reign of Romanus, Michael the Seventh, or Nicephorus. The domes at St. Mark's are pierced with windows in the dome itself, as at Sta. Sophia.*

The plan of St. Front at Perigueux is very like that of St. Mark's,—so like, that if one were not a copy of the other, they were taken from a common model,—possibly the Sti. Apostoli at Constantinople. However, the construction of the two is absolutely different: that of St. Mark's is pure Byzantine, brick veneered with marble, or covered with mosaic; St. Front is of worked stone,—walls, pendentives, cupolas, and all. It is extremely unlikely that if Byzantines built St. Mark's, that they were also masters of stone-cutting, and they must have been to execute St. Front, unless we suppose they merely gave the plans and sections, and left the French architect or mason to construct it in his own fashion, for the stonework does not look like Byzantine work. There have been bitter controversies on the question of who designed and who carried out St. Front, and as I have no fresh materials to bring that might settle the controversy, I will leave it as it is; I may, however, say that there are a few small windows in the domes of St. Front. De Verneilh has published a book and a pamphlet on this subject.

The old cathedral at Athens† is curious for many reasons; it is a very small church, only 24 ft. 2 in. wide over all, and 37 ft. 6 in. long, exclusive of the central apse, which projects about 3 ft. more; it has a narthex about 6 ft. 8in. wide, whose length is the whole width of the church. The church has three apses, and a central dome on a drum, and the internal cross is made by the four barrel vaults surrounding the dome. The nave is only 8 ft. 2 in. wide, and the bema and parabemata are cut off from the nave by the iconostasis. Outside, the cross is brought forward over the narthex, and over the bema to the front and back walls. The drawings exhibited, made by Messrs. Schultz and Barnsley, have been lent me by the school.

The cathedral shows on its face some attempts at elegance; it was evidently built during or after some occupation of Athens by barbarians, for it has barbaric carvings on it, and it has also a family resemblance to the churches in Armenia. It now stands in an open square, with its main front towards the street. It is built of large stones, with a brick course between each one of stone; its front has a dentil cornice with a carved frieze, which looks like a bas-relief, on which crosses have been worked or let into, and with a necking; at each end of the cornice is a Classic pilaster cap. In the centre and immediately under the frieze is a moulded marble arch forming a discharging arch over the lintel of the door; a moulding runs up vertically from the bottom of the ends of the archivolt, forming plain marble spandrels, and the arch itself is filled in with a carved slab with a cross in the centre; the top of the lintel is moulded, and this moulding runs across the front of the church; the lintel below is carved with pateræ, and two lions facing a cross in the middle; the door below has two plain marble jambs, which go down to the step, and there are no windows in the front below the cornice; between the necking of the frieze and the moulding on the lintel are three carved slabs on each side of the door-head, roughly symmetrical; in the centre above the cornice is the gable end of the upper roof, forming one arm of the internal cross; this gable has a two-light window in the centre, and the rest is filled up with carved panels; the north flank has a doorway in the middle, slightly projecting, and a window between it and the west end. The cornice runs through, and is stopped by the doorway, and over the doorway is another arm of the cross that gables, and this end of the cross above the roof has also a double window in the middle. A sort of half pediment is made between the west end and the gable end of the external cross by the flank wall of the lean-to roof, and carved panels are let into this side wall. The back or east end is finished with a pediment, from the middle of which rises a vertical and central straight piece, also gabled; against this the roof of the semi-octagon of the bema abuts; below, in the end of the semi-octagon, is a two-light window, and there are two other small arched windows, being those of the other two apses, which in this case do not project. The upper part of the east end is covered with carved slabs. The south flank has a line of carved slabs and one window, a doorway with an arch over, and the lower part was once painted in fresco; at the west end of this side there is the half-pediment, like the one on the north side, and the fourth arm of the cross with a two-light window in it. From the middle of the church an octagon drum rises from a square base with long circular-headed windows, whose semi-circular archivolts cut into the dome: the dome is tiled, and has a cross for a finial. The carved marble slabs inserted in the external walls are of all ages, and the carving ranges from pure Classic to pure Barbaric, and they are placed according to their form, but quite irrespective of the ornament on them. Some are upside down, and some horizontal bas-reliefs are put vertical. One panel of barbaric carving represents a hare in the claws of an eagle. Another a wild beast, possibly a cheetah or a lion, seizing a fawn. It is an episode likely to strike a pastoral or hunting people. It is repeatedly used as a simile in the "Arabian Nights," though the lamb often takes the place of the fawn, and this or a cognate subject is of remote antiquity. In the Odyssey we read that:—"Goodly Odysseus wore a thick purple mantle, two-fold, which had a brooch fashioned in gold, with a double covering for the pins, and on the face of it was a curious device: a hound in his fore-paws held a dappled fawn, and gazed on it as it writhed." (Lib. 19, Butcher and Lang.) This device is still used in the East; you may often see it carved on the blades of Indian swords or daggers, just below the hilt.

Whenever we see the hideous octagonal drums with their window archivolts cutting into the external dome, I think we shall be right in attributing them to a late date.

It is not easy to see how the external walls of churches are built at Constantinople, as they have been so repeatedly whitewashed, but I believe the plan was the same as that pursued at Athens; each course of the stonework had one or more courses of brickwork between it and the next, and the Byzantines mostly used thick mortar joints, as thick or thicker than the brick, but in addition to the horizontal courses the bricks were used in the same manner in the vertical joints, and in some

* See lithograph in the present number, showing the section of St. Mark's.

† For an illustration of this building, see the *Builder* for November 30, 1889.

cases the stones appear to have been kept short, and the spaces between these ends are filled with mortar, and with the bricks in the vertical joints cut in imitation of Cufic characters: at St. Nicodemus at Athens there is a plastered string, ornamented with this work, each bit of Cufic writing being separated by a star in brick; ordinary strings when not of marble are made by setting the bricks diagonally between two courses, flush with the wall, the points of the dog-tooth come out flush with the horizontal courses. For eaves the diagonal bricks project. At the Sti. Apostoli, at Salonica, there are patterns formed on the walls with bricks laid zigzag, horizontally, and by vertical interlacing zigzags. Windows have single, double, and triple lights. In each case, the arch generally consists of two rings, the mortar joints being thicker than the bricks. These arches are capped by circular or segmental archivolts, with zigzag bricks in them, and two-light windows often have a brick star in the spandrel between the two arches. The mullion is usually a marble slab, about 3 in. to 4 in. thick, with both ends forming a quirked bead in section, or a half octagon or hexagon. The top is finished with a cap, sometimes with a rosette under it, and sometimes with a rosette only. These little attached columns sometimes have splayed bases, and sometimes none. The arch, which is usually stilted, is carried on a cube of marble supported on the mullion; this cap is slightly splayed on the two sides, and deeply splayed at the ends. The end splays are sometimes plain, but more often carved. Sometimes the ends only project a trifle before the arch, and sometimes to the whole extent of the end splay, suggesting that a regular length was kept in stock. At the Church of the Monastery in the Country at Constantinople the mullions are of slate or dark grey marble, and only look about 2 in. thick, have square ends, and are ornamented with sunk lines at top and bottom, and with the usual cap on the top. Roofs are mostly covered with tiles, the water tiles being segmental in section, and the covers half-round. At the eaves two dabs of mortar are put in the spaces between the segmental tiles and the roof, and another dab into the hollow of the half-round one, forming a line of rude antifixæ. These devices might be adopted for cheap brick cottages or churches in the country; it is a sort of bricklayers' art. At Athens the churches are mostly minute in size; at some of them I could almost touch the sides of the nave with my outstretched arms. But at present we only see churches that are on a small scale, the great Byzantine churches of Athens were Sta Sophia, afterwards the Church of the Virgin, St. Nicholas, and St. George. I may here say that Gibbon appears to have been mistaken in confounding our patron saint with the fraudulent pork butcher of Cappadocia; these churches are better known as the Parthenon, the Erectheum, and the Theseum. On the marble walls of the Parthenon the remains of pictures of Byzantine saints and ornament still remain, and in the Theseum the Byzantine vaults of St. Nicholas still exist. The little Greek churches are curious from an archæological point of view, and are as superior in practical science to ancient Greek construction, as they are inferior to it in every æsthetic quality. Besides the stately ruins of the Acropolis, where exquisite architectural simplicity has been carried to the highest point man has yet attained, where no touch of the chisel has been given except to an artistic end, and not one in vain, where the greatest sculptors have adorned the building with the most perfect specimens of the human form, and with masterpieces of composition, we scarcely bestow a glance upon one of the little Byzantine churches beside them. Still they have their use in illustrating the history of architecture and of humanity. What we should look for, and what we shall certainly find in them, is the science with which domes are poised and the ingenuity displayed in new arrangements of plan without diverging in the main from the established type. Almost all Byzantine churches are domed; for internal effect you want the dome to rise immediately from its pendentives or squinches, so that it may form part of the general effect, when it is on a high drum you see nothing but a light space until you get under it, and then your attention is confined to the drum and dome. It is like an episode in writing, it may have what merits you please, but it interferes with the continuity of the main subject. The use of drums may, however, be looked on as a benevolent invention, when the drums and domes are not too ugly, for many more see the outside than the inside of a building.

I think that anything in architecture which merely causes surprise, reduces the architecture that employs it to a secondary level, still in that level it may be considered praiseworthy. The small internal domes, on pierced drums, have a startling effect; you look down a long aisle or narthex without windows, and see patches of bright light, and when you arrive at one of these patches and look up, you seem as if you were looking up from the bottom of a fluted well, for most of them are fluted and pierced with sufficient windows to make them seem all light in a sunny clime.

Thanks to Mr. Falkener, we have the drawings of St. Clement's at Ancyra, in Galatia, given in Fergusson's "History of Architecture;" in one respect it resembles St. Theodore, at Constantinople; the apses of the aisles are continued round so as to make circular halls; it has also a short drum to the central dome, with four windows, but the bottom of the dome itself is pierced with many windows, as at the great Sta Sophia. Were it not that St. Mark's at Venice, built in the eleventh century, has the same features, we should assign St. Clement's to an early date. We want illustrations of many more churches from Asia Minor, and more dates, before we can venture to assign the period of construction from peculiar features. I will just mention the churches in Armenia, because they have a strong resemblance to those in Athens, though rather superior to them in style, with domes of Persian shape.

The church at Dighour, in the the neighbourhood of Ani, has a plan of the regular orthodox type, a central dome on four large square piers, forming a Greek cross by means of four barrel vaults on the four sides of the dome, with an apsidal bema to the east, very narrow aisles, and no narthex; at the east end of the aisles are two oblong chambers, and from there being two small apses north and south at the east end beyond the walls, and in the open air, it has the appearance of having had a lean-to roof, or a small colonnade outside: at Usurlar these outer colonnades or arcades still exist, but the east ends of the aisles and outer arcades are square, though the bema is apsidal. Externally, the church has a strong resemblance to some of the buildings in Central Syria, the lateral sides of the cross are shown by projections above the roof gabling as at Athens, and though the east and west arms are merely indicated by a slight vertical break in the main gable, this upper part is gabled too. One of the most curious features in the church at Dighour, is the occurrence of six buttresses with off-sets and water-tables at the west end.

In a course of lectures it is impossible to give examples from every country where Byzantine Architecture prevailed, but I may say that the ancient Coptic churches of Egypt are very curious: they all appear to have a central apse, a few only have the three, and half the dome is over the bema, *i.e.*, the walls of the apse form the spring for it: these Coptic churches are curiously divided by screens, and what looks like a narthex has a tank in the middle.

Mr. W. Boutcher, who was engaged on the Assyrian discoveries, has been amiable enough to entrust me with his sketches of the church of Mar-Yakoob (Bishop James), at Nisibis, made in the year 1855. I believe no plan or description of this church has ever been published. The town of Nisibis is situated on the plain at the foot of one of the spurs of the Mount Masius, and was the key to the Valley of Mygdonia, from which Mesopotamia was mostly entered by the Persians; it had successfully resisted two attacks of Sapor II., the Persian King, and on the third attack Bishop James urged on his townsmen the necessity of resistance. Sapor had to raise the seige on account of an incursion of the Massagetæ. Nisibis was ultimately conceded to Sapor by Emperor Jovian, in the disastrous treaty made immediately after the death of Julian in his Per-ian campaign.

The church was in 1855 a double one, but there was a tradition that it once was triple, the domed one with the narthex being the middle one; each of the two remaining churches has an apse at the east end, the shorter one has a flat apse at the west end as well, with a semi-circular niche in it. In the larger church there remained one aisle going up close to the apse, and suggesting that there had been another aisle; but there was also a tradition that this was a subsequent addition to support the vault; this church was vaulted with a pointed vault. The recesses at the ends of the aisles, in a line with the springing of the apse, are square. An empty sarcophagus with a cross on it was found in a vault 14 ft. by 8 ft. under the church, and was supposed to be that of the Bishop. By some the centre church is believed to have been a mausoleum to the Bishop.

Mr. A. Graham has been kind enough to lend me one of his drawings of the Basilica at Theveste (Tebessa), the last Roman town in North Africa, being about 100 miles west of Thapsus, and at the same distance from the north shore. The old Roman Basilica, tinted in red, lay north and south; the Byzantine additions are in black. The Basilica was surrounded by cells for monks. A bema was got to the east by a descent of thirteen steps from the outer wall of the Roman Basilica, and has apses north, south, and east, much like St. Elias at Salonica. To the north and south of the east apse are two quadrangular chambers communicating with it.

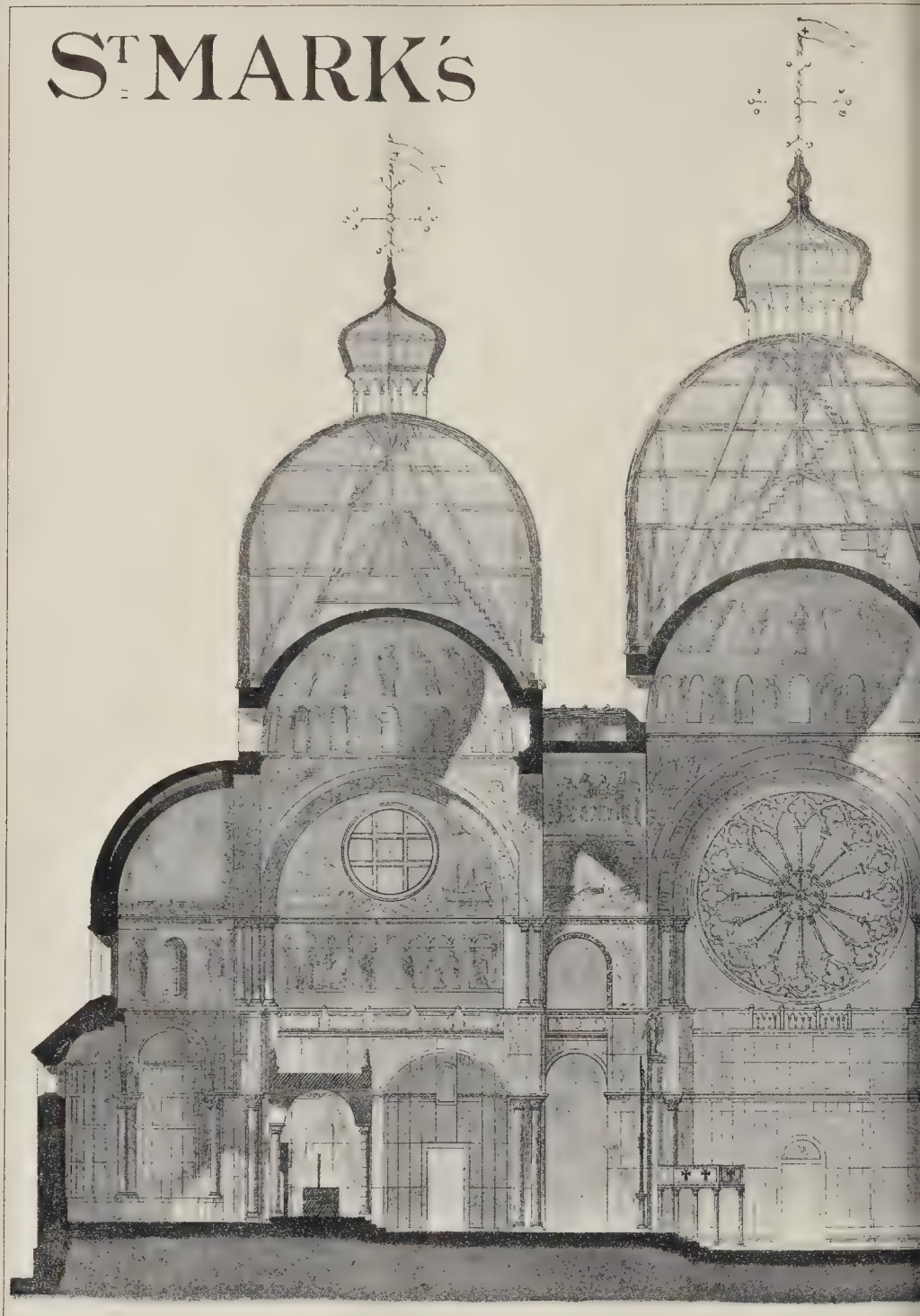
THE ROYAL ENGLISH OPERA-HOUSE.

Mr. D'Oyly Carte's new theatre, to the opening of which we have already briefly referred (see pp. 93 and 114, *ante*), and of which we gave an external view in our number for January 7 last, is situate at the junction of Shaftesbury-avenue with Charing Cross-road, and has its principal or eastern frontage facing Cambridge-circus. The building is bounded on the south by Shaftesbury-avenue, on the west by Greek-street, and on the north by Church-street, so that it forms a detached block by itself, with streets all round it. Thus, besides being, as we have already remarked, the only picturesque bit of theatre architecture in London, it is also unique, we believe, among London theatres, in being absolutely clear of contact with other buildings, and is thus exceptionally well situate for convenience of entrance and exit, and for lighting and ventilation. From this circumstance, apart from the nature of its construction, the danger from fire is reduced to a minimum, and the theatre, we understand, is deemed to be so safe in this respect that it is not to be insured. With the exception of the timber in connexion with the stage,—which is reduced to the lowest possible quantity, everything being of iron or steel instead of wood where possible,—there is very little wood in the place, and what there is has, we are told, been treated with a non-inflammable preparation. Besides this precaution, all the passages where the scenery is worked are fitted up with "sprinklers," which are in communication with large cisterns in the roof, and which can be brought into play by touching a spring-button. There are also fire-hydrants, &c., in all parts of the house. The whole of the floors, ceilings, and partitions, and also the roofs, are constructed with iron, steel, and fireproof concrete,—*i.e.*, concrete of which the "aggregates" are not of flint-stones, but of burnt ballast, and therefore not liable to fly. The internal surfaces, where not of marble or alabaster, are of Portland or Parian cement. The whole of the staircase walls, with the exception of those of the grand staircase, are lined with white glazed bricks, thus dispensing with whitewash or paper. The internal surfaces of the external walls enclosing the stage are also lined with white glazed bricks, thus ensuring not only cleanliness, but light-reflecting surfaces.

The building has been in progress since the latter part of 1888, when the foundations were laid. The site is an irregular parallelogram in shape, with its narrower end (concave on plan) towards Cambridge-circus. In consequence of the shape of the site, and of the necessity of having the stage at the wider or west end of the site, the auditorium diminishes in width as it recedes from the stage, but not in any marked degree, there being only a decrease of 14 ft. in width at the extreme end. It has been stated that this diminution in width has been deliberately planned for acoustic reasons. This is not so; it is simply due to the limitations of the site. Happily, however, it is reported on all hands that the acoustic properties of the building are very good.

A notable feature in the planning and construction of the auditorium is the absence of supporting columns to the various tiers or circles. Thus there is a good view of the stage to be obtained from every part of the house. Mr. J. G. Buckle, A.R.I.B.A., was consulted as

ST MARK'S

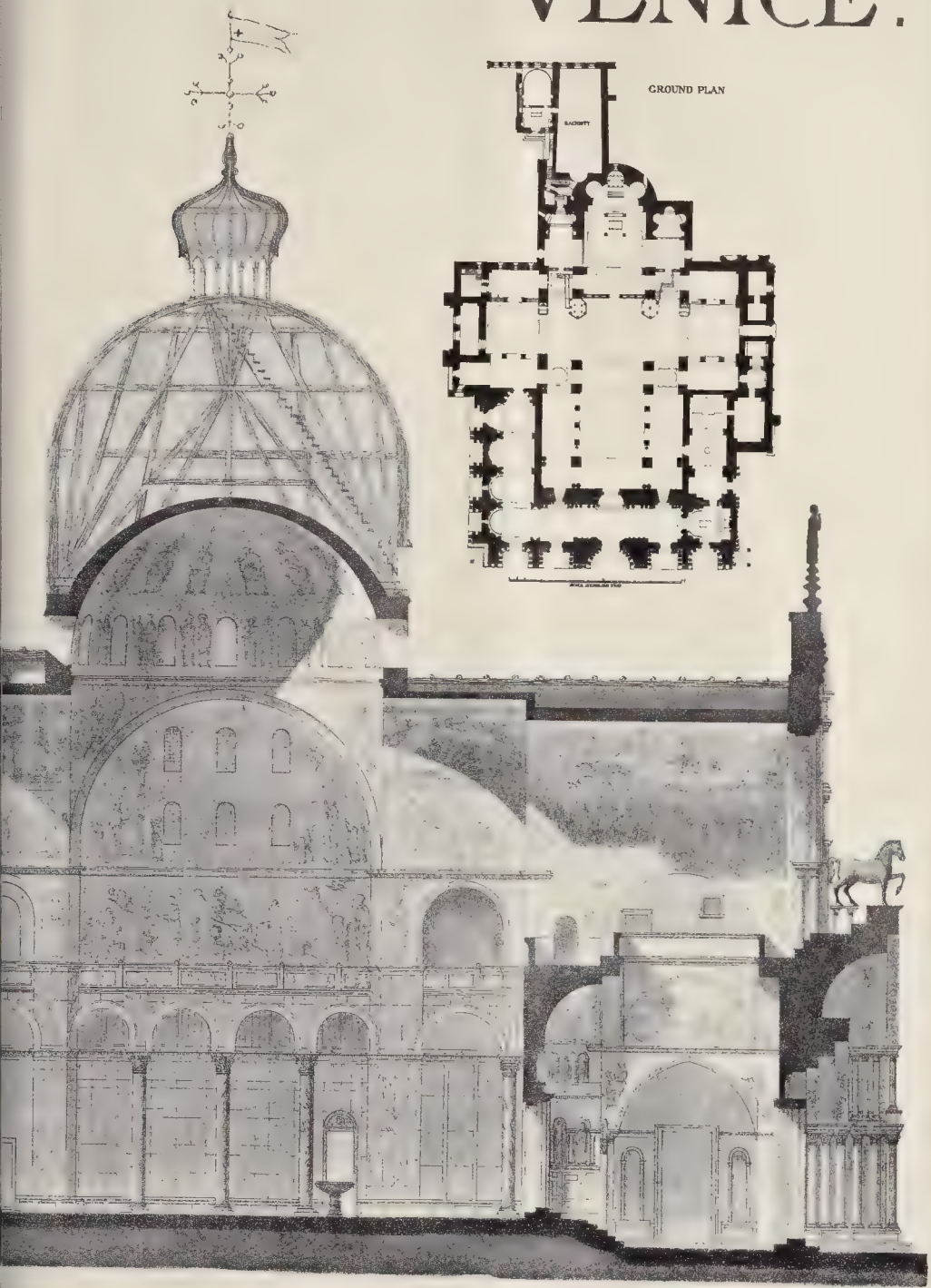


—LONGITUDINAL— SE

BYZANTINE

ILLUSTRATIONS TO PROFESSOR AITCHI

VENICE.



100ft (ENGLISH)

ECTURE:

ACADEMY LECTURES. LECTURE III.

the "sighting," or the general disposition of the "lines" of the auditorium so as to obtain an unimpeded view of the stage from every seat. There are three tiers, named respectively the Royal Tier Stalls, the First Circle, and the Amphitheatre. These tiers are constructed on the cantilever principle, and, it is claimed, in such a manner as to give a greater projection to the Circles than has previously been ventured upon. The whole of these cantilevers, with the braces, connecting girders, &c., are all formed of steel, and the tiers are calculated to sustain far greater loads of people than it would be possible to put upon them. Their rigidity, we are informed, has been tested under load and found to be most satisfactory. The steel work has been found to have a breaking-strength equal to 30 tons per square inch in section, and the construction is designed to sustain a load of 1 cwt. per square foot over the whole of the seating and corridor spaces in all the circles. It is further stated that the maximum load which it is possible to put on the tiers, together with the actual fixed load, produces a stress in no case exceeding 4 tons per square inch, or one-fifth only of the ultimate breaking-strength. The steppings and floors of these circles are of a light fire-resisting brick and concrete construction. The fronts of the circles recede from each other as they go upwards, the second tier receding from the first, and the third from the second.

The constructional iron and steel work in the building approximates to 450 tons in weight, and has been executed by the Horsley Iron Co., of Tipton, from the designs of Messrs. Neade & Tiley, civil engineers. The whole of the window-frames and casements are formed of steel, and many of the doors are of iron or steel in combination with asbestos mill-board. A spacious entrance and an extra exit have been provided to each part of the house.

The sanitary arrangements of lavatories and conveniences are very complete, and have been carried out by Messrs. Dent & Hellyer.

A complete system of mechanical ventilation has been provided. Fresh air is forced into the house by a fan, and warmed or cooled on its way, as may be found necessary in winter or summer. The fresh air enters by "Tobin" tubes in various positions round the auditorium, and the inflow can be regulated by valves. The vitiated air is intended to find its way out through apertures formed in the soffits of the circles and connected with main flues which terminate in the roof, where exhaust-fans are fixed.

While it has been Mr. D'Oyly Carte's aim to promote the comfort of his audiences, the comfort and convenience of the artistes and staff have not been forgotten. The numerous dressing-rooms (those for the ladies on the upper floors and those for gentlemen on the lower floors) of the Shaftesbury-avenue front are all fitted with steam coils for warmth, and with lavatories provided with hot and cold water; they are, in addition, electric-lighted and comfortably furnished. Moreover, a lift is provided from the stage level to the different floors; this lift is surrounded by a staircase.

The electric light installation is one of the largest and completest to be found in any single establishment in London. One-half of the working plant is equal to providing the full requirements of the house, calculated to be between 2,000 and 3,000 lights. The whole of this installation, and the general wiring and fitting up throughout the theatre, was entrusted to Messrs. B. Verity & Sons, of King-street, Covent-garden. There is no gas-lighting whatever in the building, and the heating of the corridors and saloons is effected by means of steam coils.

Although the space allotted to the orchestra is large and roomy, affording seats and music-stands for 63 musicians, the seating capacity of the house is large, there being, we are informed, 1,776 seats for the public.

The principal entrances, in the Cambridge-circus frontage, lead into a large vestibule lined with coloured marbles. In this vestibule are situate the Box Office and money-takers' *guichets*. To the left is the grand staircase, constructed almost entirely of marble, and giving access to the Royal Tier Stalls and Circle levels, and continuing on to the Amphitheatre level. The refreshment saloons on the Royal-tier stalls and Circle levels are luxuriously fitted and richly decorated with marble work, &c. There are open loggias to the first two tiers, looking out on to Cambridge-circus, and affording accommodation for smokers. The floors in the saloons, &c., are of Algerian and Italian marbles, and the ceilings and friezes are decorated with painted panels containing emblematical figures, &c, as are the ceilings of landings and the soffits of the grand staircase. The fronts of the circles and boxes are finished in green and relieved with gold. The ceiling, which is of fibrous-plaster and carton-pierre, by Messrs. Jackson & Sons, instead of being level, is made to "rake" or incline upwards from the stage-front to the gallery. The line of inclination is almost parallel to that of the floor of the stalls and pit, which is on an incline of about 1 in 8.

Under the principal entrance in Cambridge-circus there is a "winter garden," including an American bar and smoking saloon, with an entrance from the Stalls corridor. The broad jambs and soffit of the proscenium arch are lined with marble and Mexican onyx, and the stage, which is one of the largest in England, is 66 ft. between walls, the height from stage to "gridiron" being 70 ft., thus enabling the scenery to be taken up its full height without what is technically known as a "bite." The depth below the stage floor is 30 ft. To go to this depth, so far below the street level, and to keep out the water, was a difficult and anxious work, and seemed for a time to baffle all efforts to render it watertight; the task was, however, accomplished, after successive linings of concrete and asphalte.

The whole of the plans, sections, and general details of the construction and arrangements have been prepared and carried out under the personal direction and supervision of Mr. G. H. Holloway, who has also acted practically as the builder, Mr. D'Oyly Carte electing to be "his own builder" and not to place the works in the hands of a contractor. Mr. Holloway will be remembered by many of our readers as the builder of the Hôtel Métropole, the Savoy Hotel, and other large buildings erected on the same principle.

When the building had nearly reached the street level, Mr. T. E. Collcutt, F.R.I.B.A., was commissioned to design the elevations, which have been executed in red brick and buff terra-cotta. The brickwork is exceedingly good, both in material and workmanship, the bricks being supplied by Messrs. Ellis, of the Ellistown Collieries, Leicestershire. The terra-cotta work is equally good, and has been executed by Messrs. Doulton & Co., of Lambeth. Mr. Collcutt is also, we are informed, responsible for the whole of the interior decorations. The painted decorations were executed by Messrs. Collinson & Lock, under the personal direction of Mr. Frank Collinson, jun. The drop-curtain is by Messrs. Heilbronner, and the upholstery by Messrs. Maple & Co. Mr. William Morris has supplied the carpets for the corridors, grand staircase, stalls, and floors of the principal boxes. The mechanical and lighting effects of the stage are very ingenious and complete, and save much labour and danger. They have been devised by Mr. Dando. By a very complete system of electric bells and speaking-tubes under the control of the prompter, messages or signals can be sent to all parts of the house behind the scenes, and the "call-boy" is superseded. Iron or steel is used behind the stage instead of wood wherever possible,—for instance, for the framing of the bridges, runners, "fly"-galleries, "grid-iron," &c.,—and instead of hemp ropes, ropes of a kind of steel wire which is said to be kink-proof are used. In addition to the names already mentioned, we are informed that the modelling for the terra-cotta work was done by Mr. Walter Smith. The marble work of the proscenium arch and of the saloons was executed by Mr. Houghton, of Great Portland-street, and that of the grand staircase and the floors by Messrs. Burke & Co.

In one of our "Notes" this week we refer to the general effect of the internal decorations.

LECTURES ON ARCHÆOLOGY AT UNIVERSITY COLLEGE.

ON Monday, the 2nd inst., Mr. W. St. Chad Boscawen gave his third lecture* on Babylonian Archæology, the special subject being Babylonian Arts and Crafts. In commencing, he said that during the last few years important information had been gained as to the life of the earliest Babylonian population. For a long time Babylonian records were exceedingly scarce, and although we knew the archæology and culture of ancient Assyria, we knew very little of Babylonia. The discoveries of M. de Sarzec at Tel-loh, and of Mr. Rassam at Aboo-hubba, had, however, supplied us with a most valuable series of monuments, and the remains of many of the oldest and largest buildings of the country. Among these are the temple and palace built by Gudea, about B.C. 2500. The characteristic feature of Babylonian, as of Egyptian, architecture, was solidity, and this great palace, with its massive walls over 18 ft. thick, remained to give us a most perfect idea of the oldest of Oriental royal residences. Its general plan was quadrangular, the various portions of the building all being arranged around a great central court. On the right of the entrance were the State apartments of the king, with large reception-rooms or *salamlik*. Going through these by a narrow passage, connecting two guard-rooms, we enter the innermost part, or *harem*. Closely adjoining this, and overlooking it, was the temple, with its great seven-staged tower. On the opposite side of the great quadrangle were large storehouses and the servants' quarters, and in the centre a large cooling tank of water. Mr. Boscawen remarked on the close resemblance which existed between the buildings of Sargon at Khorsabad and Sennacherib and Assurbanipal at Nineveh, and said that it was one of those unchangeable characteristics of Eastern life, and from the earliest times the palace had followed this arrangement. He then proceeded to describe some extremely interesting ruins which had been found to exist beneath this edifice, one of the most curious features of which was a "step" brick pyramid which bore a great resemblance to the brick pyramid at Meydoom, which was supposed by many archæologists to be of Asiatic origin. That there was a connexion between the builder of this palace and Egypt had already been shown in a former lecture, and this was now an additional link in that connexion. Dealing with Babylonian sculpture, Mr. Boscawen said that its most distinctive feature was its truth to nature and very decided traces of portraiture. He then described the seated figures, which seemed to have formed the predominant style of royal or divine statues throughout Western Asia and Asia Minor. Speaking of the metal work, he mentioned that its principal characteristics were the early use of casting, of inlaying with gold, and the almost total absence of iron. Numerous references to the smelting of metals were to be found in the hymns and other fragments. The lecture closed with a description of the arts of pleasure, principally music, and a species of corybantic dancing. Mr. Boscawen's subject next week is Religion and Art in Babylonia.

On Thursday, the 5th inst., Professor Stanley Poole gave the second lecture* of his course on Archæology, his special subject being Greek Art. He said that in the study of this theme a great educational power would be found if we only selected properly from the great mass of material at hand, and did not follow the bad taste of former times. The period of high Greek art dates from 460-330 B.C. Everything before the former date is immaterial to us: everything after the latter date is deprived by circumstances of any interest. The revival of Greek art was due to the older races, and not to the Dorians. The Lacedemonians never produced works of high character. Prof. Poole then exhibited a drawing of the head of Pallas on a coin of the sixth century B.C., which was simply barbarous in execution, but this was, strangely enough, only a hundred years before the production of the marvels of the Parthenon; and a head of the same goddess on a coin dating just before the Persians (480, only twenty years before the Parthenon) was observed to show little improvement, the same silly "smirk" characterising the features. Athenian supremacy from 478-404 B.C. was most fruitful in art. Athenian art is indeed the union of the arts—architecture, sculpture, and painting; it is like a fine piece of music well executed, no one voice being heard above the others. Sculpture gives us the man, painting the moment; sculpture gives us character, painting gives us pathos or feeling. Painting, having to do with light and colour, gives us the momentary; sculpture, having to do with the man, gives us the form. Sculpture during the first period of Greek art was predominant. The value of coins to us is very great, as we have in them thousands of detailed examples which only require to be enlarged to give us the sculpture itself. There is no question as to their date, or as to their being true

* For brief reports of the first and second lectures of this series see pp. 70 and 90, *ante*.

* For brief report of first lecture see p. 70, *ante*.

or false. How many pieces of sculpture, for example, have their *noses?* The fatal flaw of modern art is copying,—copying. Phidias may be looked on as the central figure in Greek art, although there can be no doubt that he did not execute all the figures of the Parthenon. There we have three kinds of sculpture: high relief, the frieze along the upper part, and the great statues of the goddess Athene, by Phidias himself. The medals, containing representations of combats, the centaurs, all show his master-hand in their harmony; while the statues on the two pediments are so carefully executed all round that it might be supposed that they were to be looked at from behind as well as before. There is only *one* bad figure amongst them all, and this must have been executed by some young man of high connexions and powerfully recommended to the great artist! Professor Poole went on to speak of Mycenæ and Syracuse, showing that the sculpture of the latter was twenty years later than that of the former, and illustrated his remarks by drawings, which showed the wonderful skill of the sculptor when representing eagles, &c. He pointed out that in Greek sculpture the *curves* never returned upon themselves, but, if extended, would go out infinitely, while in Italian art in the fourteenth century A.D. it was not so, and although the specimens were fine they were too pictorial. He drew special attention to the Quadriga (of Syracuse) and showed the rhythmic power of Greek art, all the sixteen legs of the horses being represented at rhythmic intervals, while the archaic attempts of this kind showed the legs all behind each other in military order. Professor Poole concluded by adducing additional proofs of his opinion that Greek painting is not to be placed alongside of Greek sculpture. His next subject will be the different local schools of Greek art.

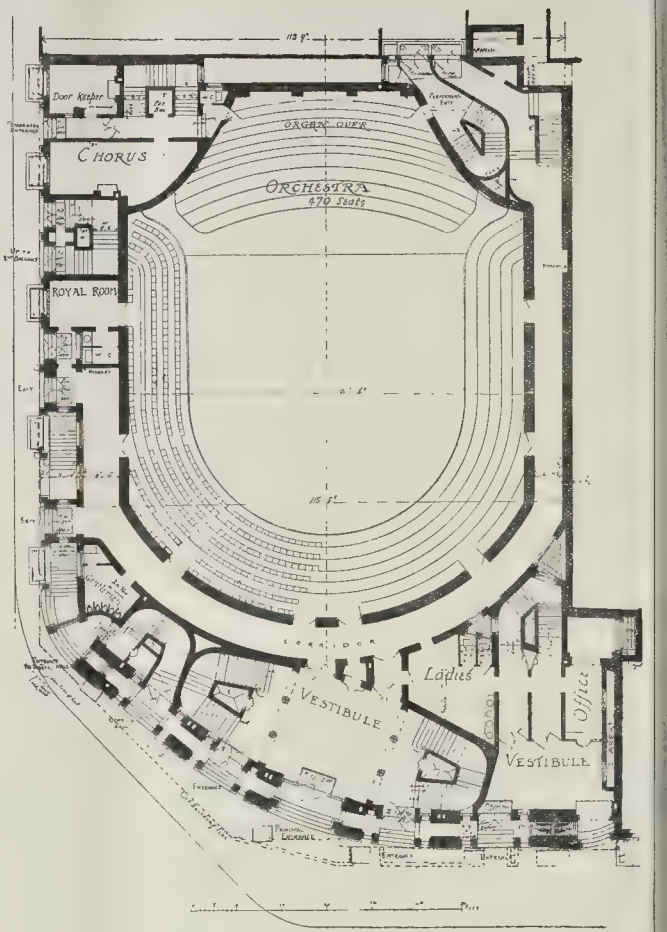
SOCIETY OF ENGINEERS.

The first ordinary meeting of the Society of Engineers for the present year was held on Monday evening, the 2nd inst., at the Town Hall, Westminster. Mr. Henry Adams, the President for 1890, first occupied the Chair, and presented the premiums of books awarded for papers read during his year of office, viz.:—The "President's Premium" to Mr. W. H. Brothers for his paper on "Weighing Machinery and Automatic Apparatus in connection therewith." The "Bessemer Premium" to Mr. R. H. Tweddell for his paper on "Application of water pressure to machine tools and appliances." A "Society's Premium" to Mr. P. Griffith for his paper on "Treatment and utilisation of Exhaust Steam," and to Mr. W. Santo Crimp for his paper on "Sewer Ventilation." Mr. Adams then introduced the President for the present year, Mr. William Newby Colam, to the meeting, and retired from the Chair, receiving a hearty and unanimous vote of thanks for his services during the past year. Mr. Colam took the Chair and proceeded to deliver his inaugural address. After thanking the members for having elected him as President, he alluded to the very satisfactory position of the society, the muster-roll now showing a total of 448 members of all classes, and reviewed its work during the past year, which consisted in the reading and discussion of papers during the session, and of visits to works of professional interest during the vacation. He then indicated the advances which have recently been made in the practical application of electricity, both as a motive power and as an illuminant, and which advances were but moderate. He referred to the opening of the City and South London Electric Railway, and described some projected lines which it was proposed to work on the same principle, observing that the working and financial result of the system on the South London Line was being closely watched in connexion with the further proposed applications. He then described the special points of an electric tramway system proposed by Mr. Mansfield, of New York, and which is on the "spot" principle. Referring to primary batteries, the President observed that it was some time since they were previously heard of, but that three had made their appearances during the past year, namely, the Renard, the Wegmersh, and an Italian battery.

The President said that he had only this week returned from an exhaustive professional tour through America, where he had been much impressed with the efforts that were being made to meet the modern demands for rapid transit in streets. He referred to many wonderful mechanical contrivances, some of which had been tried and condemned, others were being experimented with or were about to be tested as street motors. He thought that the cable system has given by far the best results mechanically and financially. He referred to what had been done abroad and in this country, and explained that the satisfactory results of the lines working in Great Britain had induced an important London Tramway Company to entrust him with the work of converting one of their horse routes to the cable system. He concluded by referring to the opening of the Forth Bridge, the satisfactory progress of the Manchester Ship Canal, the progress of the Nicaragua Canal, and the efforts now being made to resuscitate the Panama Canal. At the close of the address, which was attentively listened to throughout, a hearty vote of thanks was accorded to the President.

Death of Mr. Charles Carr.—We regret to have to hear of the death of Mr. Charles Carr, senior partner in the Woodlands Bell and Brass Foundry, Grove-lane, Smethwick, who died on the 16th ult. We are asked to mention that the business of the firm of Charles Carr will be carried on as usual by the family members of the firm.

Engineering and Building Exhibition.—We have received the prospectus of "The Third Annual International Exhibition of Machinery, Manufactures, Appliances, and Inventions incidental to Engineers, Electricians, Builders, and Ironmongers," to be held in the Royal Agricultural Hall, Islington, from April 23 to May 2, 1891. The exhibition will be under the management of Mr. Harry Etherington.



Proposed Concert Hall, Langham-place.—Plan on Street Level.

Illustrations.

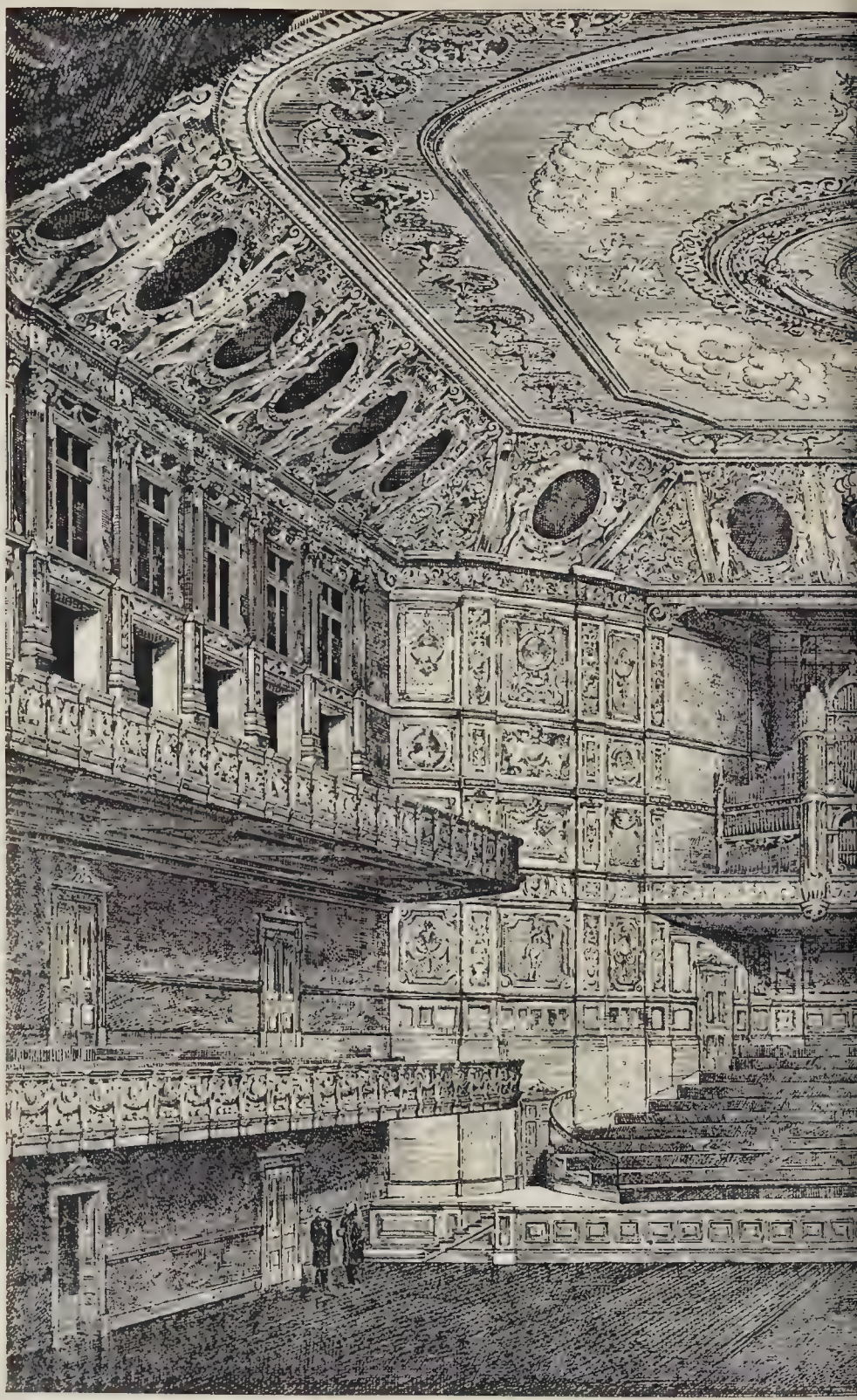
PROPOSED NEW CONCERT HALL, LANGHAM-PLACE.

We give a view of the exterior and interior of this building, which is, we believe, to be commenced almost immediately. The following description of the work is furnished by Mr. T. E. Knightley, the architect:—

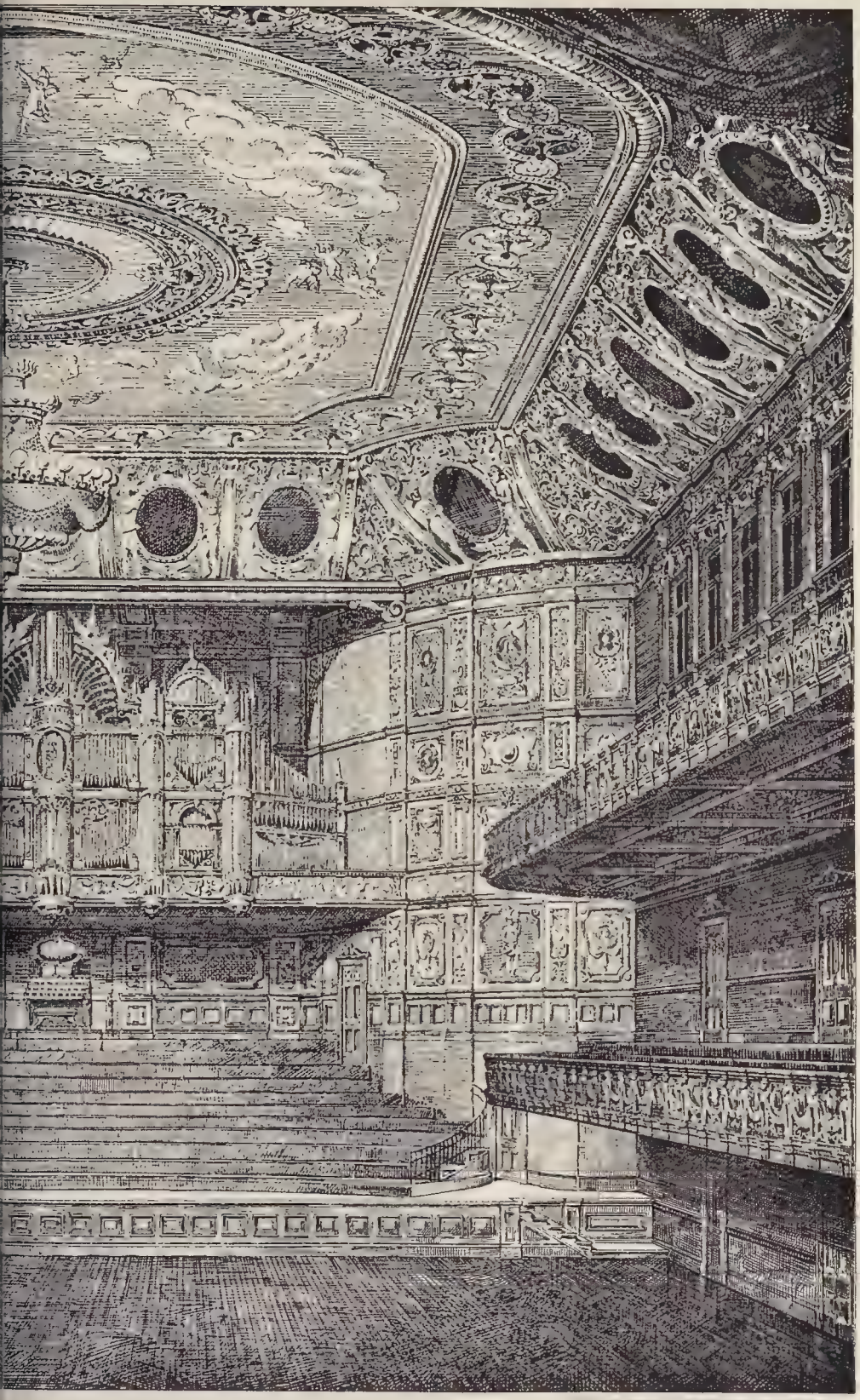
"For many years Langham-place has been disfigured by ugly and dilapidated buildings, extending from St. George's Hall to Riding House-street. These are now in course of demolition, and in their place will rise, and, I hope, be completed in twelve months, a large concert hall designed to accommodate three thousand persons. Questions of light and air obstructed progress, and necessitated placing the area and platform below the level of the street, but the facts that the site is a fine bed of gravel, and the sewer very deep, are favourable points in reference to this arrangement.

The first balcony (of which there are two) is on the street level; the entrance, therefore, will be central vertically to the façade. At the level of each floor, on flank and front, in addition to the surrounding corridor there will be loggie with doors opening on to them and several staircases, so that in the event of fire or panic escape may be easy and immediate. The loggie will serve also for lounge and promenade. Ample provision has also been made in the rear for the retreat and escape of artistes and staff.

On the lowest floor will be ornamental vesti-



PROPOSED CONCERT HALL, LANGHA



Mr. T. E. Knightley, F.R.I.B.A., Architect.

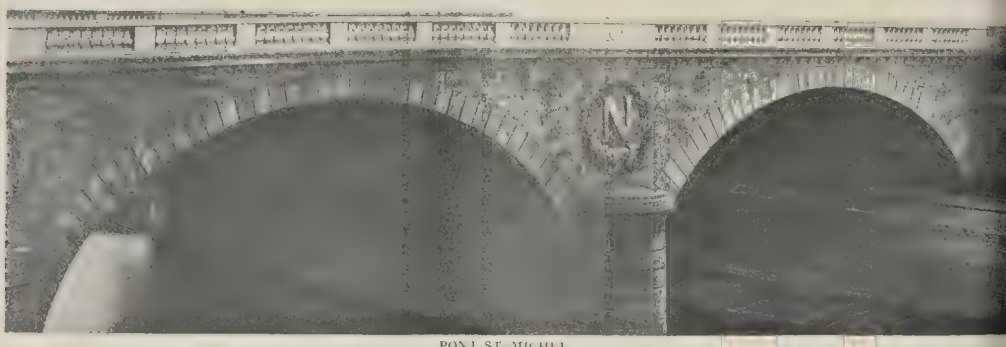
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PONT MARIE.

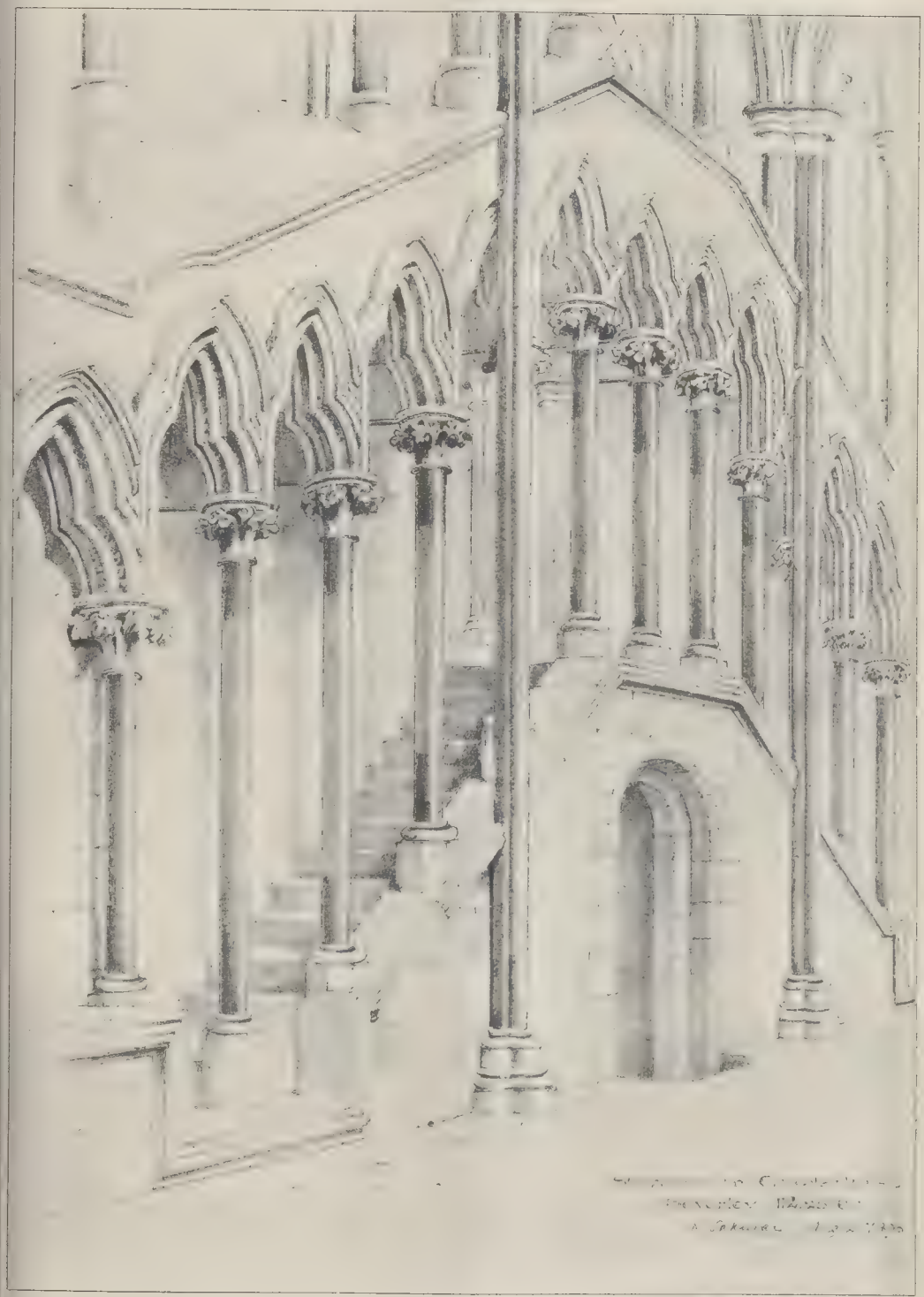


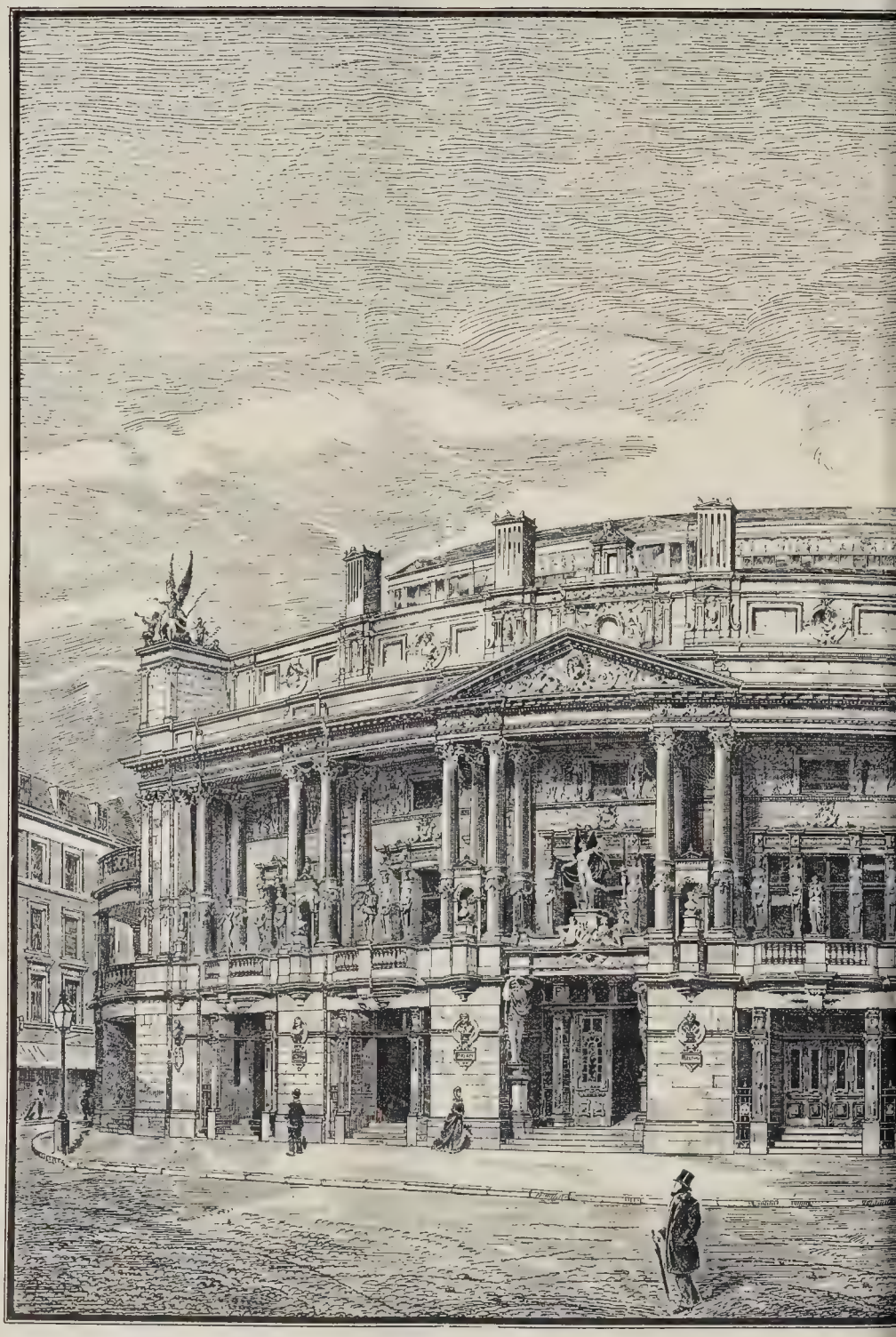
PONT-VIADUC DU POINT DU JOUR.



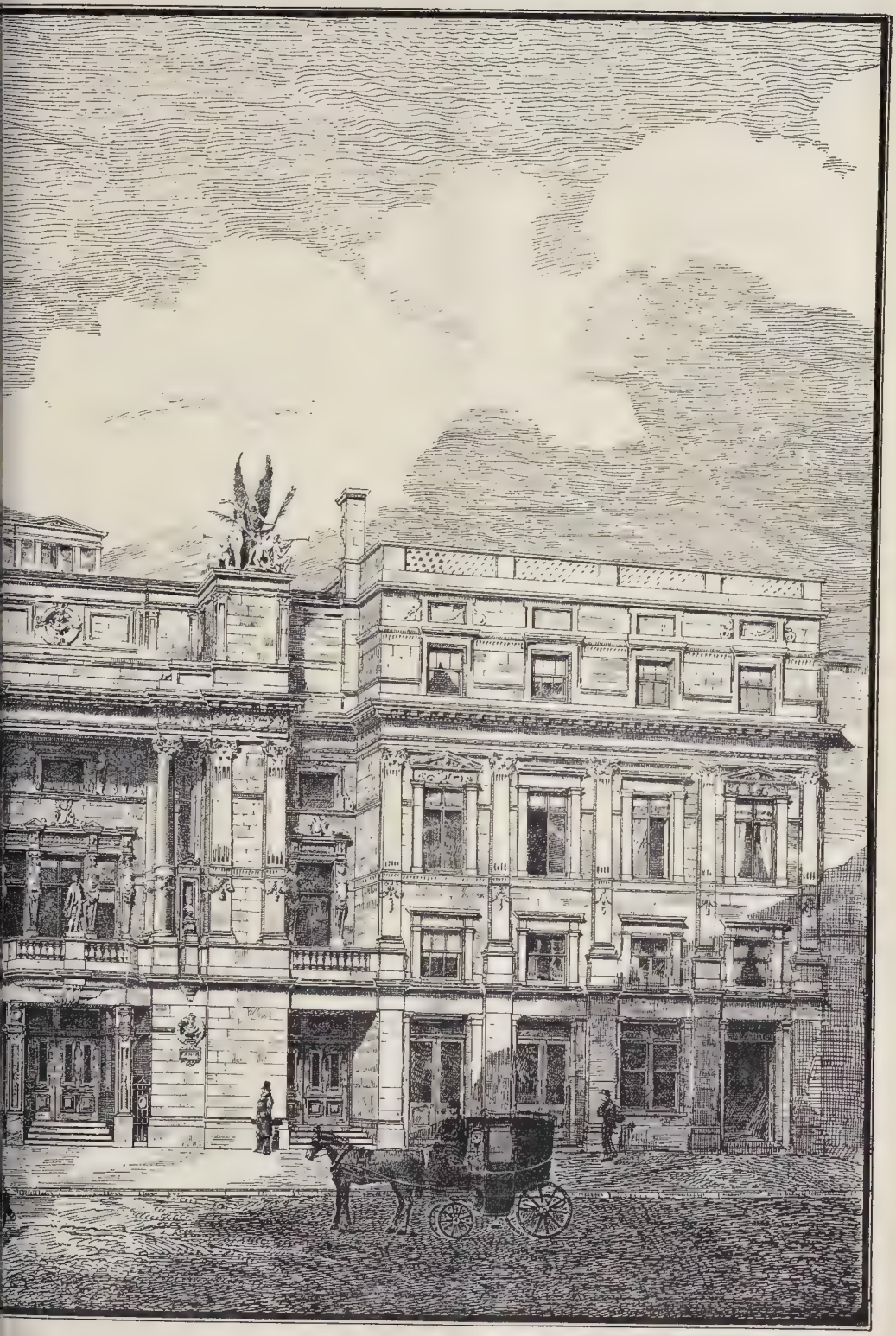
PONT ST. MICHEL.

SEINE BRIDGES, PARIS.





PROPOSED CONCERT HALL, LANGHA



. T. E. Knightley, F.R.I.B.A., Architect.

bule, saloon, grill-room, &c.; at the street level, offices and two vestibules; on the first floor, foyer and saloon, and on each floor rooms for ladies and gentlemen; and above these a small concert-room.

The chief fronts will be built with Portland stone. The design contemplates columns coupled at their bases, with niches for busts; these are to rest on massive piers relieved with circular panels, each framing a bust of some eminent composer. The principal entrance will be marked by figures, standing on pedestals and supporting the entablature, which will be crowned by seated figures bearing musical instruments. The entrances right and left of the centre will have carved pilasters, side-lights, and ornamental ironwork; above each will be a curved corbelled balcony, with ornamental balustrading extending throughout the front. The venetian windows—five in number—will have each four mullions, caryatide-like in form, and the frieze charged with figures in low relief, emblematic of the uses of the building.

The front was designed of more imposing height, and above each pair of columns groups of figures were intended; but this had to be given up, the church and schools saying "No." The sharp angle formed by the junction of Riding House-street and Langham-place will be rounded off and the space thrown into the public way. The Riding House-street elevation is more simple, consisting mainly of a colonnade of two stories. The principals of the roof will be of steel, and to cope with the light and air difficulty the body of the roof is to retreat, the principals showing outside appearing as flying buttresses.

The feature of the internal design, which it is hoped may be most distinctive, is on the reversal of the lines usual in such cases,—frequently a horseshoe; in this one a parallelogram with a curved end, wind instruments being the inspiration. For example, the end of the horn is internally convex, and that form has been adopted for the orchestra. The junction between ceiling and wall is usually a hollow curve; in this case it will be the reverse. Some few months back when at Brighton I chanced to test the acoustics of the room which Mrs. Siddons always selected for her readings. It has a raised daïs at each end, and is designed to support a dome; the ceiling above each daïs towards the body of the room has a convex form, as in this case. The experiment was reassuring.

The walls of the auditorium will be lined with wood, fixed clear of the walls on thick battens; coarse canvas will be strained over the wooden lining, on which will be spread a film of composition, and on this will be raised ornament. The canvas is to check the vibrations of the woody fibres, and as vertical forms of support internally have been dispensed with, that the sound waves may not be broken, the hollow lining, it is calculated, may be as the body of the violin,—resonant.

The contractor is Mr. C. Wall, of Chelsea; and the raised ornament will be executed by M. Noel Quillett, of Paris. The view of the interior was exhibited in the Paris *Salon*, 1889, No. 64—5,201. T. E. KNIGHTLEY."

We may add that there is no doubt that a new and first-class concert-room for London, better planned and more comfortably arranged than St. James's Hall, is much wanted; but it is important to bear in mind that any hall which is to supply that desideratum must above all things have an ample and well-planned orchestra. Acoustically St. James's Hall is a very good room; its great fault, besides its inconvenient and ill-planned approaches, is in the cramped proportions of the orchestra; sufficient for a band, but not large enough for a chorus of adequate proportions in addition; and even the chorus that can be got in is wofully cramped and packed.

ST. MARK'S, VENICE.

THE section of this celebrated building is reproduced from a drawing which forms one of the illustrations to Professor Aitchison's third Royal Academy lecture on Byzantine Architecture, which is printed *in extenso* in the present number.

SEINE BRIDGES AT PARIS.

THE views of three of the Paris bridges here given are in illustration of the article on the subject on another page, to which the reader is referred.

BEVERLEY MINSTER.

THE collegiate church of St. John is the larger of the two fine churches at Beverley. The eastern arm of the church, like Salisbury and Worcester Cathedral, has an eastern Early English transept, and the interior is remarkable for some very gorgeous monuments, including the well-known Percy Shrine. The staircase, a drawing of which, by Mr. Sakurai, we give to-day, led to the Chapter-house, and is in the north aisle of the choir, being Early English in style, like the portion of the building in which it is situated.

THE ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of this Association was held in the meeting-room of the Royal Institute of British Architects, Conduit-street, on the 6th inst., Mr. Leonard Stokes, President, in the chair.

The minutes having been read and confirmed, Mr. J. Oscar R. Perry was elected a member of the Association.

Mr. E. S. Gale (hon. sec.) announced that the first sessional visit would be to Messrs. Hobbs' new buildings, Salisbury-street, Strand, at three o'clock on Saturday afternoon, February 14.

Mr. J. M. Brydon then read a paper entitled "The English Renaissance of the Eighteenth Century." At the outset he said that the present paper was a sequel to a paper read by him before the Association two years ago* on "The English Classic Revival of the Seventeenth and Eighteenth Centuries." In his former paper, however, so much space was occupied with the rise and progress of the style during its great age,—the seventeenth century,—that he was then able only very briefly and very imperfectly to notice the works of the later Renaissance of the eighteenth century. He now proposed to take up the thread of the story where he was then obliged to let it drop, and to notice a few of the great works of the eighteenth century, from the time of Wren to that of Sir William Chambers. He should limit his remarks almost entirely to civil architecture,—firstly, because he had already spoken of the principal churches in his former paper; and secondly, because what ever else the eighteenth century was, it was certainly not a great church-building period. On the contrary, it was a great house-building age. Something like two hundred mansions, many of them of vast size, were erected in England during that time, which was an age of great palaces, beginning with Blenheim and Castle Howard, by Vanbrugh, and ending with Somerset House, by Sir William Chambers. The period was a most eventful one for this country, politically and socially, and was teeming with poets and painters, statesmen and warriors, wits, beaux, and Court beauties. If any sentiment more than another was uppermost in that brilliant society, it was the cultivation of letters, along with the worship of the hero or lion of the day, and the general glorification of men and women as such, which naturally found its expression in the building of costly habitations wherein to house their persons and their partisans. In that Augustan age of England, there was no lack of brilliant men in architecture.

Who so fitted to open the ball as Vanbrugh, knight and poet, architect and Clarencieux King of Arms? Born in 1666, he spent his early years in France, and became a soldier while still very young. But the army did not seem to have been very much to his taste, as he soon resigned, and in 1695 we find him Secretary to the Commission for the Completion of Greenwich Hospital, where he was afterwards (in 1716) appointed Surveyor of Works. The first works that seemed to have brought him into notice were his plays, "The Relapse" being produced in 1697 and "The Provoked Wife" in 1698. During all this time, however, he must have been devoting himself to the study of architecture, and to such good purpose that in 1702 he produced his design for Castle Howard. He was at this time also Comptroller of the King's Board of Works, and in the thirty-sixth year of his age. Two years after this, in 1704, he designed Blenheim. So suddenly did this young man burst on the architectural world, that before he was forty he had two such mighty palaces in hand as those just named, and Swift wrote of him,—

"Van's genius, without thought or lecture,
Is hugely turn'd to architecture."

* See *Builder* for February 23 and March 2, 1889.

At that time, of the great seventeenth-century men, Wren was still busy building St. Paul's, the top stone of the lantern of which was laid in 1710. Wren was forty-two when he designed St. Paul's, and Vanbrugh was thirty-eight when he designed Blenheim, Wren being then seventy-two. Thus, for a short time, the two men were contemporaries; but nothing could be in greater contrast than the methods and the styles of these two architects. While Jones and Wren raised order upon order, Vanbrugh worked with only one, and thus introduced the chief characteristic of the eighteenth century, and paved the way to that everlasting feature, the portico,—so much so, that scarcely a house of any size was erected during that period without a portico, oftentimes with two,—and, in one house, at least, actually with four, one on each front. Then, again, to Vanbrugh belonged the founding of the English type of plan,—developed later with so much success, the principal features of which were a central block with detached wings, often connected to the centre with curved colonnades, and enclosing a great entrance court in front: a truly palatial scheme, grandiose in the extreme, and to which the only proper manner of approaching the entrance was in a chariot with four horses and outriders. Magnificence and state were the orders of the day, and here was the *mise-en-scène* for their display. More than that, however, Vanbrugh in a very skilful manner combined the requirements of the state rooms of a palace with the apartments of a private mansion, resulting in a very stately arrangement of halls and corridors, showing a thorough mastery of the complicated problem.

At Blenheim, the Great Hall is a magnificent apartment, so was the Long Gallery or Library,—the latter a survival of a prominent feature in Elizabethan manor-houses, but here turned to other purposes. The weak point in the planning of Blenheim was the great staircase, or rather staircases, for there are two. They are long and narrow, badly arranged and badly lighted, and cut across the openings between them and the hall in the most awkward fashion. They seem to have been sacrificed to some false idea of symmetry. Had the architect but omitted one of the chambers looking into the courts at the side of the hall, and given us one magnificent staircase, lighted from the court, instead of the present two, the result would probably have been in every way satisfactory, and the plan would have gained one notable feature the more.

As to the architecture of Blenheim, probably no building had ever been assailed with more contradictory criticism from Pope and Horace Walpole,—who, content to live in a barbarous den at Strawberry-hill, could yet say of Vanbrugh: "He seems to have hollowed quarries rather than to have built houses,"—to our own Fergusson. If the combination of palace and mansion was difficult in plan, it was still more so in elevation. The work spoke for itself, and as a recent writer had said:—

"It is a monument which, with all its errors of taste, its debased ornament and ponderosity of detail, bespeaks a fine sense of largeness of form, great power in the treatment of masses, a fertile fancy, and a bold, if not audacious, originality in the man who conceived it. It looks above everything what it was intended to be, but which, emphatically, it was not,—a nation's offering."

Mr. Brydon also quoted from Sir Joshua Reynolds, who said that,—

"To speak of Vanbrugh in the language of a painter, he had originality of invention, he understood light and shadow, and had great skill in composition. To support his principal object, he produced his second and third groups and masses; he understood perfectly, in *Ars* art, what is the most difficult in ours,—the conduct of his background. . . . What the background is in painting in architecture is the real ground, on which the building is erected; and no architect took greater care than he that his work should not appear crude and hard—that is, it did not abruptly start out of the ground without expectation or preparation."

And Sir Joshua went on to say,—

"This is a tribute which a painter owes to an architect who composed like a painter, and was defrauded of the due reward of his merit by the wits of his time, who did not understand the principles of composition in poetry better than he, and who knew little or nothing of what he understood perfectly, the general ruling principles of architecture and painting."

And no one who drove through the magnificent park, and over the bridge between the lakes into the great court-yard, but must acknowledge that Sir Joshua was right. Vanbrugh built many other notable works, besides Castle Howard and the Woodstock palace, but the author had singled these out as examples of

his work, because they were not only the best-known, but were the foundation both in plan and style of much that followed afterwards during the century. A new motive, as well as a new impetus, had been given to the building of English country houses, and as we turned over the pages of the "Vitruvius Britannicus," we began to realise the immense influence they had on all subsequent work. Probably on no one was that influence stronger than on Hawksmoor, Vanbrugh's assistant at Blenheim. He followed in his master's footsteps with several country houses of more or less note, and was the architect of the well-known churches of St. Mary Woolnoth, Lombard-street, and St. George's, Bloomsbury,—the former begun in 1716 and the latter several years later. These churches were in a manner,—particularly the former one,—an ecclesiastical version of the architecture of Blenheim, with the same grouping of masses, the same heaviness of detail, the same characteristic rustication. The interior of St. Mary's was really very striking; though a small church, only some 56 ft. long and 54 ft. broad, a great effect has been attained by very simple means. Twelve Corinthian columns, in groups of three at each angle, carry a square clearstory, pierced on each side by a large semi-circular window. The lighting is thus chiefly from the clear-story. This church has often been compared with Wren's St. Stephen's, Walbrook, though the plans of the general treatment are very different,—in fact, they present a striking contrast. Moreover, Hawksmoor shirked the problem of a galleried church. His galleries were mere excrescences, and had little to do with the structure of the design. When Mr. Butterfield re-arranged the interior in 1875, he removed the galleries, and the church gained vastly in effect from the alteration. The author wished he could say as much for the decorations Mr. Butterfield introduced. As to St. George's, Bloomsbury, it was long the fashion to decry, in no measured terms, its fanciful steeple with a statue of the wretched George I. on the top of it; "stuck like a wen to the rest of the building" as a critic of the time declared. For all that, the portico is not without dignity, and by sticking his steeple to one side, instead of on the roof of his portico, as Gibbs did at St. Martin's, and James at St. George's, Hanover-square, Hawksmoor showed himself a greater artist than either of them; and no one who saw the steeple before it was again blocked up with the present common-place flats but must have acknowledged how admirably it grouped with the church, with telling effect, from almost every point of view. But for the sake of a little more gain in ground-rents, it is built up once more.

A contemporary of Hawksmoor, and a pupil, like him, of Wren, was James Gibbs, the architect of St. Martin's-in-the-Fields. Having spoken of Gibbs's work at some length in his former paper, Mr. Brydon did not enlarge upon it in the present paper, but pointed out that the before-mentioned trenchant critic of St. George's steeple was found pleading for St. Martin's what has just been denied to St. George's. Writing just on its completion, the critic exclaimed:—

"I could wish, too, that a view was opened to St. Martin's Church. I don't know any one of the modern buildings about town which more deserves such an advantage. The portico is at once elegant and august, and the steeple above it ought to be considered the most tolerable in town."

Doubtless it would be, were it not astride of the sharp angle of the portico roof. Could critic Ralph have seen St. George's as we see St. Martin's he might have been more "tolerable" himself. Another critic, Walpole, who was nothing if not abusive, says of Gibbs that

"Like Vanbrugh, he had no aversion to ponderosity; but, not being endued with much invention, was only regularly heavy. His praise was fidelity to rules; his failing, want of grace."

But of Walpole himself another critic had said: "He would have sacrificed all the artists he ever commemorated for the sake of antithesis, or a pretty turn in a period."

While Vanbrugh, Hawksmoor, and Gibbs had been busily employed, the nation itself had been equally busy in history-making.

To the succeeding period, or just immediately before it, belonged Burlington House; then came the church of St. Mary-le-Strand, the Radcliffe Library at Oxford, and St. Bartholomew's Hospital, by Gibbs; the Horse Guards, by Kent; and the Mansion House, by George Dance. Most of these buildings were noticed in Mr. Brydon's former paper, but he wished to again call attention to the beautiful woodwork in the interior of the Mansion House, particularly in a room upstairs known as the Ball-room, which had all the character which he claimed as peculiarly English. The walls were panelled and divided into compartments by pilasters of the English Ionic order, excellently carved, and round the room ran a charming gallery. The whole apartment was a model of proportion, good taste, and elegant detail, well worthy the careful attention of the student.

Country-house building proceeded apace during the time of George II., and great Classic mansions became multiplied all over England. They were too numerous to mention, but generally speaking the portico craze was rampant in them all. An ultra-wild example of that mania was "Mereworth Castle," in Kent, by Campbell, which had four porticoes,—one on each front,—with a circular hall and dome in the centre. The force of absurdity could no further go Specially notable among the houses of this period was Kent's masterpiece, Holkham, which he built for the Earl of Leicester. In the planning and the proportion of its rooms it was almost unrivalled. Its exterior was dignified and refined in detail, while its interior decorations, particularly the ceilings, were beyond all praise. Chambers, who was very chary of compliments, says of it,—

"It is exceedingly well-contrived, both for state and convenience; and with regard to the whole interior decoration, it may certainly vie, in point either of magnificence or taste, with anything now subsistent in England."

But while all this palace and mansion building was going on, there was gradually growing up the humbler vernacular of the Georgian domestic work which we, by some strange vagary, called "Queen Anne;" examples of which abounded in London and in most country towns throughout the kingdom. Under Walpole's vigorous sway, commerce had largely increased, money had become more plentiful, and as a consequence houses for the middle classes were in demand, and new quarters of the town were laid out and built over. The chief characteristics of these dwellings were good honest building in brick and woodwork. Though little was spent on their exteriors, still they had a quiet homeliness which was not without a certain dignity. And this was arrived at by very simple means, such as sash-windows brought out almost to the wall-surface, and surrounded by an architrave moulding; a panelled door of good proportions, surmounted by the familiar shell-hood, or adorned with a couple of columns and a pediment; some carefully-cut brick cornices with occasionally a few pilasters or quoins at the angles; and a wooden block cornice of excellent detail at the eaves. Internally, the rooms were of good proportion, sometimes panelled in wood with carefully-detailed cornices, skirtings, and chair-rails. Great attention was paid to such features as chimney-pieces and staircases, and to that period may be ascribed some of the best examples of the latter, with their broad, easy steps, turned and twisted balusters, and richly-moulded handrails. A type of one class may be found in the staircase of the Arts Club, Hanover-square; of another at the house, No. 9, Clifford-street, and a third in the staircases of the Mansion House. All this picturesque effect was obtained in the simplest and most natural manner. It was also thoroughly English, for one would never find it anywhere else,—a true and fit expression of the people for whom it was designed, a priceless legacy bequeathed to us by those humble artist-builders of the past, for which we could never be sufficiently thankful. Was it too much to plead for a return to their quiet thoughtful ways, for the abandonment of the senseless frippery and vagaries of modern "Queen Anne," where everything was so loud and vulgar and meaningless, so un-English and so unworthy of the cultivation of this highly cultured age? Whither was the work of the present day tending? He wished his hearers to consider whether to be busy and *outré* and what was called "original" was after all the highest aim, or likely to result in the truest art? He asked them also to study the ground deeply ere they launched out with some brand-new house, it might be in some old-time street or square,—to pause and think whether they had any right to intrude their so-called "Queen Anne" into the quiet harmony of the bygone life,—to throw the whole melody so generously played for us out of tune? Let them rather, with the reverence that befitted all true students of art and nature, seek diligently for the treasures enclosed in those old-world vessels, for haply they might find them and profit much thereby.

During the latter part of the eighteenth century the building of great mansions went on with little abatement. London was growing westwards at a great rate, and streets and squares grew into existence over the green fields and the daisies. We had a strong school of English painting, sculpture, and the drama. Shortly after the beginning of the reign of George III., in 1768, the Royal Academy was instituted, with Sir Joshua Reynolds as President and Sir William Chambers as Treasurer. To the latter's influence with the King the Academy owed its establishment thus early.

Sir William Chambers was by birth a Swede, having been born at Stockholm in the year 1726. In early life he went to sea, and visited the East Indies and China. He seems to have had a natural taste for drawing, as he sketched away during these voyages, and on his arrival in England in 1757, he published his sketches of the buildings and costume of the Chinese. After that he gave up his commercial life, and travelled into Italy and studied the great works of the architecture of the fifteenth and sixteenth centuries. He returned through France, and in Paris examined the works of the French Renaissance, sketching and making notes wherever he went. Shortly after his return to England, he became Instructor of Architecture to the Prince of Wales, afterwards George III., who became so fond of him, that when he came to the throne he appointed him his architect, and promoted him whenever he could. Thus was Chambers fairly launched on the high-road to fame and fortune. He laid out Kew Gardens, and designed a number of buildings and temples for their embellishment. He published views of these in 1763, and on presenting some drawings of the Gardens to the King of Sweden in 1771, his Majesty conferred on him the Order of the Polar Star. Ornamental gardening was a favourite subject with Chambers. He published a treatise on it in 1772, which was followed by a lampoon, said to be by Mason, the author of "The English Garden," and beginning with the following lines:—

"Knight of the Polar Star! by fortune plac'd
To shine the cynosure of British taste;
Whose orb collects in one refulgent view
The scatter'd glories of Chinese virtu,
And spreads their lustre in so broad a blaze,
That Kings themselves are dazzl'd while they gaze!"

Chambers had his early disappointments, like other architects. His design for Blackfriars Bridge was rejected in favour of Mr. Mylne's because it was too expensive,—a reason not unknown in latter-day competitions. His design for Lord Clive's villa at Claremont shared the same fate,—a design by "an intruder," as Chambers called him (the celebrated landscape gardener, "Capability" Brown), being preferred by his lordship. He seems to have made several designs for the new church then in contemplation for the parish of St. Marylebone; one, circular in plan, with a Doric portico, and surmounted by a dome,—a design said to have been very beautiful, but ill-adapted to the Church of England services. Ultimately the church was built by a pupil of Chambers's, Thomas Hardwick. It has the inevitable portico, facing that cheerful aspect, the north! Result: gloom and grime, instead of sweetness and light. Chambers's great opportunity, however, arrived in 1775. He was selected by the Government to make designs for the public offices to be built on the site of old Somerset House, and the first stone of the new building was laid in 1776. The general disposition of the building is so well known as hardly to require description; still, as we do not often get the chance of hearing a building described by its own architect, let Sir William Chambers speak for himself. In the report laid before the House of Commons on May 1, 1780, when the works had been in progress about four years, he tells us that:—

"The building which faces the Strand is now almost completely finished: it extends in front 135 ft., is 61 ft. deep, and has two wings, each 40 ft. wide and 42 ft. in depth, the whole being seven stories high.* It is faced with Portland stone. . . . All the fronts of this structure are decorated with a rustic arcade basement, a Corinthian order of columns and pilasters, enriched windows, balustrades, statues, masks, medallions, and various other ornamental works, necessary to distinguish this principal and most conspicuous part of the design, and likewise some profusion of ornaments to mark its superiority. Decorations, too, have been more frequently employed in the vestibule of entrance, and in all the public apartments of this build-

* *I.e.*, counting from the basement.

ng, than will be necessary in the remainder of the work, because the vestibule opens to the most frequented street in London, is a general passage to every part of the design, and the apartments are intended for the reception of useful learning and the polite arts,* where, it is humbly presumed, specimens of elegance should at least be attempted. The work just described forms the upper part† of a large quadrangular court, being in width 240 ft., and in depth 296 ft., surrounded with buildings 54 ft. deep and six stories high,‡ containing the Navy and other offices."

Then he told us how these buildings were progressing, and that the great river front, when finished, was, according to the general design, to be 800 ft. in length. Then came a description of the river terrace and of the heavy foundations necessary, followed by a reference to the architect's great bugbear, the cost. He wrote:—

"The building now erecting on the site of Somerset House is of a very uncommon kind,—unusually extensive, intricately complicated, and attended with many and great difficulties in the execution; whence it was at first, and is even yet, impossible to form an exact estimate of the expense. As far, however, as the architect's judgment and experience in business can guide him, he thinks it will certainly not exceed the sum of £250,000*l.*"

Poor man! How one can sympathise with him, and from one's "experience in business" feel little surprise that he was wofully wide of the mark, for it appeared from another report, in March, 1790, that 334,703*l.* had then been expended on Somerset House, and that 33,500*l.* was still required to complete the structure. Even that, as might be supposed, was not enough, and fully half-a-million was spent ere all was done, exclusive, of course, of the new wing facing Wellington-street, added by Pennethorne thirty-five years ago, and which has done so much to improve the general effect of the building as a whole.

The most striking features of Somerset House are the entrance loggia, the great courtyard, and the river front. The loggia has been compared and contrasted with the entrance to the Farnese Palace at Rome, but it is altogether different, both in plan and design. Without doubt the court is the most magnificent "quad" in London, just as the river front is unrivalled by anything yet erected on the Thames. Fault had been found with it as being too flat and lacking a dominating feature in the centre; but for all that, for broad simple treatment, and the stately dignity that befitted such a public building, we had nothing at all to come near it. A happy idea, as it seemed to the author of the paper, was that of the open-work screens at the end of the streets on each side of the central court, giving just that play of light and shade that was most telling when seen from the river. Somerset House was also a splendid example of excellent workmanship combined with a noble building material,—Portland stone,—in striking contrast with the rough-and-tumble surfaces and tawdry colour of terra-cotta and other ephemeral latter-day makeshifts,—just as the largeness of its general idea and the proportions of its parts are a rebuke to the frippery and littleness of much of our modern work.

Besides Somerset House, Chambers built several large mansions both in town and country, such as Woburn, for the Duke of Bedford, and a mansion in Piccadilly for Lord Melbourne. As an author he was even better known than as an architect, his "Treatise on the Decorative Part of Civil Architecture" being by far the most instructive work of the kind that has yet appeared in England.

A man of so many accomplishments naturally drew around him many of the most celebrated artists and men of letters of his day; Johnson, Goldsmith, Garrick, Burney, and Reynolds were amongst his friends; and with a few members of his own profession he formed a sort of club, known as "The Architects' Society," which held its meetings monthly at the "Thatched House" Tavern. Full of years and honours he died in May, 1796, and was buried in Westminster Abbey. With the close of Chambers's career came practically the close of the English Renaissance as it was understood during the seventeenth and eighteenth centuries. For two hundred years it had been the national style in which, with few exceptions, all buildings were designed. Into the "Adamite" style the author did not care to enter, for the vigour of the earlier work lived not in it. Some pretty conceits in external decoration were certainly produced; but it is difficult to understand how Robert Adam could have travelled and sketched and studied in Italy and Greece and returned only to give us the shadow instead of the substance of all he must have seen and known. The golden days of the English Renaissance were over, and though the tradition never quite died out of the land, still it was overwhelmed by the Greek revival; and within eighteen years of the close of the century, a competition for the new parish church at St. Pancras produced the building to be seen in Euston-road; a design avowedly made up of "bits" from its Athenian prototypes,—a church which cost twice as much as St. Martin's-in-the-Fields. Comparison would show which was the finer church. The coming-in of revivals was like the coming-in of waters: we could never tell where they would stop. Since the eighteenth century we had had some three or four. Each had strutted its little hour upon the stage and gone out of fashion for the next comer. We had been "everything by turns and nothing long,"—now Greek, now Goth, now new Queen Anne, until the art of designing great buildings as understood by the mighty men of old was becoming a lost art.

The study required to master the principles of light and shade, to acquire that skill in composition so valued by Sir Joshua Reynolds, was now frittered away in the elaboration of some pretty detail, till a Club-house became like a row of houses, a great public building like an apartment house, and our street façades like cabinet-work. Such buildings might be all very clever, but it was not by such superficial effects as they exhibited that we could hope to rival the productions of such masters as those of whom he had been speaking, either as works of art or as national monuments. It was a singular fact that, as already stated, Vanbrugh and Chambers were never trained as architects at all, as we understood the term. How, then, did they get their knowledge? Simply by study, by a diligent use of their eyes, their pencils, and their note-books.

In conclusion, Mr. Brydon took exception to a remark made by Col. Prendergast in the course of the discussion on Baron de Geymüller's paper on Bramante at the Institute meeting last week. The Colonel declared that at present the whole country was craving for Italian architecture. Mr. Brydon said he differed from that. It was true that things had become somewhat chaotic, but if he apprehended the drift of the current aright, it was not for Italian that the country was craving, but for an English architecture worthy of its best traditions. We must turn for inspiration, for guidance, and for instruction, not alone to Italian, but to English architects,—not alone to Bramante, or Palladio, or Vignola, but to Jones, and Wren, and Chambers, the great masters of our own national Classic, and to the school of which they were such illustrious exponents.

Mr. H. O. Cresswell moved a vote of thanks to Mr. Brydon for his interesting paper, in which he had given them reason to feel proud of what had been done by English architects. Sir William Chambers was a man upon whose works they could not but look with admiration. Seeing what had been done by Vanbrugh and Chambers, the question arose whether it would not be a good thing for young men who wished to become architects to serve for a time as soldiers and sailors.

Mr. T. E. Pryce said he had great pleasure in seconding the motion. The present paper, as well as the one of which it was the sequel, had gone thoroughly into the subject. Touching the question of the education and practice of the architects of the time, one got just glimpses of it in such books as Evelyn's "Diary" and D'Israeli's "Curiosities of Literature." The last-named work contained a curious account of Vanbrugh's difficulties at Blenheim. Recently, in the *Journal of Proceedings* of the Royal Institute of British Architects, there had been published some interesting letters by Vanbrugh, which were well worth reading. Some time ago a friend was good enough to give to the Association some original letters written by Sir William Chambers; some of them were published in *A. A. Notes*, but he was sorry to say that their publication had been discontinued, owing to the disapproval expressed by some of the members, who thought that they occupied space which might have been better filled. Some of these letters referred to Chambers's connexion with landscape-gardening, and to the publication of his book on "Chinese Gardening," the history of which was exceedingly amusing.

Mr. W. J. H. Leverton, in supporting the motion, said it appeared to him that the characteristics of the English Renaissance architecture of the eighteenth century, were quietness and sobriety. The buildings of that period contrasted very favourably with most of the buildings of the present day, which were fussy and cut up with gimcrack ornament, or at any rate were too much overloaded with detail.

Mr. C. H. Brodie also supported the motion. He said he was very glad that reference had been made to the interesting letters by Vanbrugh which had appeared in the *Journal* of the Institute; and with regard to the letters of Sir William Chambers which had been presented to the Association, he hoped that their publication in *A. A. Notes* would be resumed. With regard to the early life of Vanbrugh and Chambers, he was disposed to think that if some of our young architects were to follow the example of those two distinguished men and go abroad for a few years before they commenced designing town halls and municipal buildings, it would be much better for them. It struck him that the manly character of the architecture produced by the great men to whom Mr. Brydon had referred, was largely due to the manly training which they had received.

After a few remarks from Mr. Bolton,

The Chairman, in putting the motion, said he desired to add his personal thanks to those of the members who had already spoken for the very interesting paper which Mr. Brydon had given them. But he could not go quite so far as the lecturer in his eulogy of Blenheim, which, although a very grand pile, was very depressing. As Mr. Leverton had pointed out, the characteristic of the work of the men to whom Mr. Brydon had been referring was simplicity of general form. Effect was obtained by reliance upon good proportion and simple straightforward lines. As to the advisability of young architects going abroad before commencing practice, there was no doubt that there was nothing like foreign travel for enlarging men's ideas. He quite agreed with what had been said to the effect that a large building ought not to be designed in such a manner as to look like a row of shops or tenement houses. He did not think that we could have a better example of the proper way of designing a large building than was afforded by Mr. Norman Shaw's new Police head-quarters on the Victoria Embankment, which, from the broadness of its masses and simplicity of its treatment, could not possibly be mistaken for an aggregation of smaller buildings.

The resolution was then put and carried, and Mr. Brydon briefly replied, expressing his indebtedness to Messrs. Baggallay, Pryce, Pennell, Jackson, and Miller for the very interesting drawings which they had kindly lent him for the illustration of his subject.

Advanced Class of Construction and Practice.—At the meeting of this class on Wednesday last, Mr. Owen Fleming read a paper upon the subject of "London Drainage," considering it under the following heads:—1. The present unsatisfactory nature of the drainage system of London houses. 2. The various regulations of the different Vestries governing the laying down of drains. 3. The desirability of framing a uniform code of by-laws for the whole metropolis. 4. The scope and nature of such by-laws. 5. Difficulties incident to the effectual administration of such by-laws. In the discussion which followed, Messrs. Goldsmith (chairman) and Satchell, A. W. Snell, Brodie, Harvey, and Cooksey took part.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday afternoon, Sir John Lubbock, Chairman, presiding.

Tenders.—Tenders were received (*a*) for alterations to the Abbey Mills Pumping Station, and (*b*) for the construction of a weir, &c., at the Barking Outfall Works. (The lists will be found among the other lists of "Tenders" which we publish this week.)

Technical Education.—Nearly the whole of the remainder of the sitting was occupied with the discussion of a long report from the "Special Committee on Beer and Spirit Duties" as to the application of money derived from these duties, and accruing to the Council, for the promotion of technical education. It appears from the report of the Special Committee that

"In accordance with the resolution passed at the meeting of the Council on October 7, 1890, the sum

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* Meaning the Royal Academy and the Royal Society.
† *I.e.*, northern side.
‡ *I.e.*, counting from the basement.

of 140,000*l.* to be received under 53 and 54 Vic., cap. 60, for the financial year 1890-91, has been placed to the credit of the General County Account in relief of the rates. The further sum of £23,000 expected to be received on account of the year 1890-91 has not been so allocated, nor has any provision been made for the application of the sum of 163,000*l.* expected to be received on account of the year 1891-92. To these two latter sums the Committee have confined their attention."

The Committee's recommendations were:—

"1. That the sum to be received from the Beer and Spirit Duties on account of the current financial year, over and above the 140,000*l.* which has been placed to the credit of the General County Account, and which is estimated to be about 23,000*l.*, be devoted to the furtherance of technical education in London.

2. That in 1891-2, and so long as an adequate amount may be received from the Government for the purpose, a sum to be determined each year, but in no case to exceed the estimated produce of a 1d. rate, be devoted to technical education in London.

3. That a Standing Committee on technical education be appointed to consider and report as to the application of the money devoted from time to time by the Council to that purpose, and generally to deal with the subject.

4. That the money be given to the following institutions in the form of capital grants to be expended (save where specially ordered otherwise) in buildings, fittings, apparatus or plant to be used exclusively, or at any rate mainly, for the purpose of imparting technical education to persons of the artisan or labouring classes—

Institution.			Amount of Grant.
Borough-road Polytechnic			£4,000
Battersea	,,		4,000
Chelsea	,,	conditionally upon the schemes being carried out within two years	2,500
St. Pancras	,,		3,000
Holloway	,,		3,000
Regent-street	,,		4,000
Working Men's College			500
Joint Committee of School Board, City and Guilds Institute, and Drapers' Company (having due regard to 52 and 53 Vict., cap. 76, sec. 1 (1))			1,000
National School of Cookery (for training teachers)			500
University Extension Scheme (to organise lectures for artisans at low rates of admission)			500 "

As an amendment to the first recommendation, Mr. Benn moved,—

"That in view of the schemes which the Council now has or may hereafter take in hand for the housing of the working classes, the acquisition of open spaces, and similar efforts for the improvement of the condition of the London poor, the sum to be received from the beer and spirit duties on account of the current financial year (over and above the 140,000*l.* placed to the credit of the general county account) and also any further sums which may be derived from the same source, be carried to the credit of the general county account."

This amendment was carried, on a division, by 50 votes for to 45 against, and the further consideration of the subject was adjourned.

Waterlow Park.—On the recommendation of the Parks Committee, the Council agreed to an expenditure of 4,800*l.* for the laying-out of Waterlow Park and fitting it for the use of the public. After transacting other business, the Council adjourned.

CLERKS OF WORKS' ASSOCIATION:

ANNUAL DINNER.

THE eighth annual dinner of this Institution took place in the Venetian Saloon of the Holborn Restaurant on Monday evening last, Mr. Charles Barry, F.S.A., F.R.I.B.A., in the chair.

The usual loyal and patriotic toasts having been duly honoured, Colour-Sergeant Aitchison replying for "The Reserve Forces,"

Mr. J. Wilkinson proposed "The Architects and Surveyors," a toast which, he said, needed no commendation in that assembly. With the toast he coupled the names of Mr. James Brooks and Mr. Henry Lovegrove.

Mr. James Brooks replied in a felicitous speech, contrasting the present-day conditions of architectural practice with the conditions which obtained in the eleventh, twelfth, thirteenth, and fourteenth centuries. In Mediæval times, architects devoted many years and sometimes the whole of their lives to the erection of one building, but in the present day they were constantly flitting about by rail from one county to another, and from England to Scotland, Ireland, or Wales. Having to erect works in all parts of the kingdom, they could not possibly do without the assistance of competent and trustworthy clerks of works. In that Association architects knew they had an able body of honourable men upon whom they could always rely.

Mr. Henry Lovegrove replied on behalf of "The Surveyors."

The Chairman next proposed the toast of the evening, "The Clerks of Works' Association." He said that although the Association was as yet an infant of only eight years of age, it was in a very healthy and flourishing condition. In the eight years of its life it had gathered within its ranks no fewer than 125 picked men. He could not say how many men were willing to swell their ranks, but admission to membership was not obtained without close and minute scrutiny into the character and capabilities of the applicants. The constitution and objects of the Association were in every way praiseworthy, and from his own personal experience and the testimony of his friends who had applied to the Association for clerks of works they were fully adhered to and acted upon. The Association was not a benevolent society, and neither accepted nor sought outside aid. But one of its objects was to promote mutual aid and instruction by their meetings for lectures, papers, and discussions, and by the interchange of experiences. The clerk of works occupied a position of great responsibility and trust, and it was therefore an excellent thing for them to have an Association amongst themselves for promoting their practical efficiency and for maintaining the honour of its members. Considering the onerous nature of the duties of clerks of works, he must say he did not think that, generally speaking, their remuneration was adequate. Public bodies and all who were carrying out large and costly works which demanded the supervision of an intelligent clerk of the works might very well be expected to bear the very small extra cost which would be involved by paying an adequate salary to the clerk of works. At present the standard rate of payment which they received was decidedly too low. In conclusion, the Chairman said he gave the toast with the full conviction that he spoke the sentiments of all his professional colleagues in wishing the Clerks of Works' Association collectively, and its members individually, all health and prosperity.

Mr. R. Wheeler, President of the Association, briefly replied.

Mr. F. Dashwood, in a humorous speech, proposed "The Worshipful Company of Carpenters," coupled with the name of Prof. Banister Fletcher, past Master of the Company. Mr. Dashwood spoke of the great help which the Carpenters' Company had rendered the Association in its work.

Professor Banister Fletcher, in responding, invited the members to meet him some afternoon to see the new "Reference Architectural and Building Construction Museum" at King's College.

Mr. Linn Dillon next proposed the health of "The Hon. Treasurer" (Mr. John Oldrid Scott), which was received with great enthusiasm, Mr. Scott having been what was described as the foster-parent of the Association.

The other toasts were "The Press," proposed by Mr. Brady (who was good enough to speak of the *Builder* as "that grand old journal"), and coupled with the name of our representative; "The Visitors," proposed by Mr. P. J. King, and associated with the name of Mr. Charles Bell, F.R.I.B.A.; "The Chairman," proposed by Mr. T. Gamage; and "The Hon. Secretary," proposed by Mr. Webb.

THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN:

ANNUAL DINNER.

THE eighth annual dinner of this Association was held on Saturday evening last, at the Holborn Restaurant; Dr. B. W. Richardson, F.R.S., President, in the chair. The attendance was large, and included Sir Joseph Fayrer, the Hon. Albert Hood, Mr. Woolner, R.A., Mr. Wyke Bayliss, F.S.A. (Society of British Artists), Dr. J. S. Bristowe, Mr. David Chadwick (formerly M.P. for Macclesfield), Captain W. H. James (ex-Chairman of the Sanitary Committee of the London County Council), Dr. Douglas Lithgow, Mr. John Smeaton, and other gentlemen well known in the sanitary world. After the loyal and patriotic toasts had been disposed of,

Captain James responding for the "Army, Navy, and Reserve Forces."

The Chairman gave the toast of the evening, "Success to the Association." The toast, he said, deserved the approbation of all, because of the "magnificence" of the work the members of the Association performed. That term might be thought singular, but it was justified, for they devoted themselves to the reduction of death and sickness and sorrow—and there could not be finer work for man to perform than that. The enormous importance of their work was well shown at the Health Congress held at Hastings two years ago, when Mr. Wilson Noble, in an address to the sanitary section, stated that there were in our country 125,000 deaths per annum from preventible causes. Reckoning for each case of sickness a duration of 18½ days, the money lost to the nation in wages, at the rate of only 2*s.* per day, would amount to 7,750,000*l.* If only half the people were in the ranks of the labourers this preventible disease meant a loss each year of the work of 1,000 men for 100 years, when the extra days lost during illness and convalescence were added. In other words, the work of 100,000 men was annually abstracted from the productive industry of this country by sickness that was preventible. To prevent disease was the work of the members of the Association, and more magnificent work could not fall to the lot of man. They went to the foundation of the evil by attacking the primary causes of disease, and not unfrequently the devotion of the inspector cost him his life. Knowing as he did the value of their work and the devotion of these men, it was with the utmost cordiality that he proposed the toast, and wished all success to that national association of sanitary inspectors.

The toast having been duly responded to,

Mr. McMillan, Q.C., proposed "Science and Art," coupled with the names of Sir Joseph Fayrer and Mr. Wyke Bayliss.

Sir Joseph Fayrer said the medical profession was deeply indebted to the inspectors; and to the ministration of the members of the Association the profession might look for a continuance of improvement in sanitary science, which had made such marked progress of late.

Mr. Wyke Bayliss, in the course of his response, drew an interesting parallel between art and sanitation. The Association and art were fighting the same battle, and under the same banner. One word, "Health," was inscribed on the banner of the sanitarians, and the artists had on their banner also one word, "Beauty," and the two words were the same, for without health there could be no beauty.

Dr. J. S. Bristowe (Medical Officer of Health for Camberwell) next proposed "The President."

Dr. Richardson, in replying, said he had been reminded of his early career by his friend, Dr. Bristowe, recalling the fact that forty years ago he had received his first lessons in sanitary science during an epidemic of cholera from Professor Sir Richard Owen, and had been associated in practice with Dr. Robert Willis, the translator of the works of Harvey, Spinoza, and Cervetus. In succeeding Sir Edwin Chadwick as President of that Association, he had succeeded a man of most remarkable character, and attained to an honour which he esteemed more than any that had been conferred upon him. He should regard it as a privilege to serve the interests of that Association as long as his life might be preserved.

In responding to the toast of "Municipal Local Government," subsequently proposed by Mr. E. Lewis Thomas, M.A., LL.B.,

Mr. Harry Wilkins, Vestry Clerk of St. James's, Westminster, dealt at considerable length with the Metropolis Water Supply Bill, introduced by Sir Algernon Borthwick, the provisions of which were, he thought, worthy of consideration.

The next toast was "The Executive," proposed by Mr. H. H. Collins, F.R.I.B.A., who testified to the valuable services rendered by sanitary inspectors to local authorities, and referred to the great difficulties under which such authorities were often placed by the ambiguity of the sanitary laws and the conflicting decisions of judges. Mr. Hugh Alexander, Chairman of the Council of the Association, and Mr. R. Farrow, of the Staffordshire Branch, responded to this toast.

The last toast was "The Visitors," coupled with the names of Mr. Thomas Woolner, R.A., and Dr. Douglas Lithgow, who both responded, Mr. Woolner making a very interesting speech, in which he contrasted the present conditions of life with those which prevailed in the time of Bishop Latimer, Erasmus, and John Shakspeare, father of the poet, observing that when we read the records of the manners and customs of those days, we ceased to wonder at the plagues and pestilences which so often broke out and devastated whole towns. Dr. Douglas Lithgow also briefly replied.

COMPETITIONS.

PROPOSED NEW BATHS, COVENTRY.—The assessor appointed to adjudicate upon the thirty-nine sets of plans received in the competition for new baths for the Coventry Corporation has awarded the first premium of 100*l.* to Mr. Harold T. Burgess, London, and the second of 50*l.* to Messrs. John Giles & Gough, London.

NEW PUBLIC OFFICES, HUYTON-WITH-ROBY, LANCASHIRE.—At the monthly meeting of the Huyton-with-Roby Local Board, held at the Public Offices, Blacklow-brow, a report of the sub-committee appointed to examine the competitive plans for the new public offices was read. Thirty-one plans were examined, and they awarded the first prize (50*l.*) to No. 23, second (30*l.*) to No. 24, and third (20*l.*) to No. 27. On referring to the names, the successful competitors were:—First, Mr. H. A. Cheers, Twickenham; second, Messrs. Boney & Wainwright, London; third, Messrs. Woolfall & Eccles, Liverpool; recommending, on the advice of the assessor, the plan of Mr. Cheers for adoption by the Board. The adoption of the report and recommendations was put and carried.

PROPOSED WESLEYAN CHAPEL, CUDWORTH.—The design of Mr. Charles T. Taylor, A.R.I.B.A., of Oldham, has been accepted in competition for proposed new Wesleyan Chapel, Cudworth, near Barnsley. The work is to be proceeded with at once.

STUDENT'S COLUMN.—We are obliged to hold over this for a week.

BRITISH ECONOMIC ASSOCIATION.—Mr. A. J. Balfour and Mr. John Morley have been appointed Vice-Presidents (in addition to Mr. Leonard Courtney and Mr. H. C. Childers) of this Association, which now numbers about 500 members. The journal of the Association will be published by Messrs. Macmillan, and the first number will appear at the end of March.

Books.

Bibliothèque des Merveilles. Les Statuettes de Terre cuite dans l'Antiquité. Par E. POTTIER. (Paris: Hachette.)

PERHAPS no branch of archæology is so interesting to the amateur as that of terra-cottas. It requires no training to appreciate the beauty of the Tanagra figurines, no science, no scholarship to understand their significance. Hence they have always been eagerly sought for by the collector, and for no objects of ancient art have such purely fancy prices been paid. This being the case, it is somewhat strange that in English we have no handbook on the subject; a chapter or two in general manuals of archæology is all that is accessible to any but the specialist. M. Pottier's book will probably have a wide circulation in England, and not go long untranslated. He is a first-rate authority on the subject, his position as *attaché* at the Louvre giving him every opportunity for close and protracted study. His investigations in the kindred subject of vase-painting are well known, and he handles vast and scattered material with that ease and lightness which seem to be the specialty of the French *savant*. In his introduction he fixes the place of terra-cottas in the study of archæology generally. Ten chapters are then devoted to their chronological sequence, beginning with some account of Oriental "motives," and taking the subject down to Roman and Gallo-Roman times. Then follow two chapters which might, we think, have come first, on the "fabrication" of terra-cottas and their "destination." We may quote M. Pottier's admirable concluding summary:—"Il-y-a un double enseignement à tirer de l'histoire des terres cuites antiques. Le sont des œuvres d'art et des *ex-voto*. Elles sont produites par l'accord des deux sentiments les plus profonds chez la race Hellénique, le goût du beau et l'instinct réligieux. Voyons dans chacun de ces éléments ce qui peut intéresser la vie moderne." The book has ninety-two wood-cuts, mostly taken from the atlas of M. Henzey's "Catalogue des Figurines Antiques."

The Building and Machine Draughtsman. By various Practical Draughtsmen. (London: Ward, Lock, & Co. 1890.)

THE above work, consisting of some 300 pages of closely-printed matter and a large number of illustrations, is written essentially for the young student about to learn the use of drawing instruments. Part of the matter has already appeared in the *Industrial Self-Instructor*, and the Editor of that periodical now publishes it in one volume, by which means he is enabled to treat the subjects much more fully.

Considerable care has been taken by the several authors to treat each subject in a clear and practical manner, so that the book may be of assistance to those who are unable to secure the services of a master.

Maximum Stresses under Concentrated Loads. H. T. EDDY, C.E., Ph.D. (New York: D. Van Nostrand Company. London: Trübner & Co. 1890.)

WHEN a train passes over a bridge, there is a certain position it must occupy to cause the greatest stresses in the girders supporting it, and the author of the above work shows how this position can be easily determined by a new graphical method.

The work is divided into two parts. Part I. deals with simple girders and single intersection trusses under concentrated loads, and Part II. with cantilevers with two supports, and double intersection trusses with end supports. The proof of the several graphical constructions used is given in algebraic form.

The subject can hardly be considered one of general engineering interest, but the name of the author is sufficient to recommend the work to the specialist in bridge construction.

Geometry of Position. By ROBERT H. GRAHAM. (London and New York: Macmillan & Co. 1891.)

NOT many years ago the man who possessed the information now contained in "Molesworth Engineering Pocket-Book" would command sufficient learning to solve nearly all the questions that an engineer of his day could be expected to answer. To-day, however, the case is very different, as hardly a week passes without some more or less important work being published with which it is necessary for scientific men to make themselves acquainted; and if it were not for the fact that a large proportion of the books contain little that is really new, the reading to be done would be so considerable, that little time would remain for the practical application of the knowledge obtained.

Mr. Graham's book, however, will appear to most English students as decidedly original, as it is the only work in our language upon the modern science which the French and Germans have named the geometry of position. The study of this science has now been made compulsory in the Federal Polytechnic of Zürich, in Strasburg University, and in other similar institutions, for on the Continent graphical statics are more generally used than in England.

In the first portion of the book the author deals with such problems as illustrate chiefly the theory of the subject, but the last four chapters are devoted to such practical matters as the application of reciprocal figures to finding the stresses in roofs and girders, determining the centre of gravity of various figures, the construction of ellipses of inertia and kerns, and the solution of questions relating to the elastic line, particularly in connexion with continuous girders. At the end of each chapter, Mr. Graham has appended a set of examples, all of which can be worked out by the principles he has previously established.

Although this book is comparatively small, yet it represents much labour on the part of the author, and those who are making a study of graphic statics will act wisely by adding this volume to the list of works which they intend reading in connexion with that subject.

Memorials of Edinburgh in the Old Time. By Sir DANIEL WILSON, LL.D., F.R.S.E. Edinburgh: Adam and Charles Black; 1891. Parts I. and II.

THIS is a second and amended edition of Dr. Wilson's work, appearing in parts. It contains much interesting writing about old Edinburgh, with a good many fairly-executed engravings representing old monuments, some of them now removed. There is however a somewhat antiquated style about the illustrations, and the author's architectural information is not up to the mark, as he gives under the title "Norman Capital from Holyrood" (page 59) an engraving of what is a fully-developed Early English capital, with nothing Norman about it.

Preliminary Survey and Estimates. By THEODORE GRAHAM GRIBBLE, Civil Engineer. (London: Longmans, Green, & Co., 1891.)

THE above book is the most recent addition to that useful series of works, known as the Text-books of Science.

The work is written more particularly for those about to open up a new country, and much of the information given is derived from American practice, but it contains also some useful matter which will be found of service to civil engineers and surveyors at home, who are engaged on Parliamentary or similar work.

When a new line of railway is proposed, the promoters generally ask an engineer to advise them on the following points. Firstly: if any kind of line is feasible. Secondly: whether it is likely to pay. And, thirdly: what type of railway would be most suitable, and what style of rolling-stock. They also ask the engineer to furnish a plan and estimate of one or more routes which he considers eligible.

The first question the author dismisses at once, for nowadays a railway may be constructed nearly anywhere,—if the money can be found for the purpose,—and provided it can be shown that there is every prospect of the proposed line earning sufficient to pay the shareholders a fairly good dividend, there is little chance of the capital not being forthcoming.

In the first chapter, the author states that a single line, with rails of 30 to 40 lb. per yard, and with engines from 15 to 20 tons, can be made in an easy country for 4,000*l.* per mile, including the equipment, in almost all parts of the globe, provided the line starts from the seaboard, or from a place in railway connexion with the seaboard, and that such a line, properly located, is capable of handling 1,000 tons of freight a day, and is, therefore, even with low rates, in a position to yield about 10 per cent. on the cost of construction.

Such a line cannot be located except by an experienced man. The gradients and curves to be adopted and the class of rolling-stock that will be most suitable all require careful consideration, and the author gives such information,—partly taken from standard works on the subject,—but chiefly from his own experience, that cannot fail to be of great value to all engaged on work of this nature.

In the second chapter of the book Mr. Gribble deals with Route-Surveying or Reconnaissance, describing the methods most suitable to different circumstances, and explaining the various projections adopted in ordinary map construction. In the two following chapters will be found such information on Hydrography, Hydraulics, and Geodetic Astronomy as is likely to be required for the preliminary work in a new country; these are followed by others on Tacheometry, Chain-Surveying, Curve-ranging, Instruments, and Preliminary Estimates. The manner of using the slide-rule for arithmetical calculations is also given, and the mathematical tables and formulæ likely to be required are placed in an appendix. A glossary, explaining the scientific terms that have been used, will be found at the end of the book.

That the description given may be clear and intelligible, some 130 illustrations are scattered throughout the book, and no pains seem to have been spared to render the work as complete as possible, and to treat in a concise form, and in a thoroughly practical manner, those subjects with which civil engineers and surveyors should be acquainted.

G. Richard Lepsius. Griechische Marmorstudien. (Aus dem Anhang zu den Abhandlungen der Kgl. Preuss. Akademie der Wissenschaffen zu Berlin, 1890. Berlin: Reimer.)

AN archæologist has occasionally need to be a geologist. The need for a careful specialist examination of the *materials* of Greek sculpture and architecture, and for a precise determination of their nomenclature, has long been felt. This need Dr. Lepsius meets in the treatise before us, which might be called a handbook of *petrography*. He meets it, too, in a way calculated to be serviceable to the student who is not a geologist; the descriptions of the several varieties of marble are full and clear, and easy to be understanded of the layman. How much marbles differ in constitution, and how important to clearly understand this difference, may be seen from a single instance. Every one who visits Athens marvels at the beauty of the gold-red colouring of the columns of the Parthenon, the Theseion, the Propylæa, but how few know that this is due to the fact that the marble employed in these structures contains —,122 of oxide of iron (Fe^2O^3), which, when the surface of the marble is corroded by the action of the atmosphere, is converted into oxyhydrate of iron, a strong colouring matter. On the other hand, the columns remaining of the Temple at Sunium are still of their original glittering white. Analysis shows that the marble here contains no particle of oxide of iron. The book is one that no one interested in ancient sculpture or architecture can afford to neglect.

Waterlow Brothers & Layton's "Architects', Surveyors', and Auctioneers' Diary and Almanac for 1891" (London: 24, Birchin-lane) is an excellent production, well arranged, well printed, and well bound. It contains, besides the usual miscellaneous information, lists of members of the Institute of Architects, the Surveyors' Institution, the Institution of Civil Engineers, and other professional societies; a digest of Acts of Parliament relating to buildings (including the Metropolitan Building Acts and Metropolis Local Management Act); an index to the General Statutes; general conditions for building contracts (sanctioned by the Institute of Architects); the Institute's schedule of rules for professional practice and charges of architects; a list of District Surveyors; the regulations of the Superintending Architect's Department of the London County Council; the Bylaws framed by the Metropolitan Board of Works under the Building Acts; and a large variety of other matters of special interest to the architectural profession and the building trade. It will be found exceedingly useful.——Messrs. Hayward Brothers & Eckstein, of Union-street, Borough, send us a useful quarto desk-diary, interleaved with blotting-paper, and forming, at the same time, an illustrated catalogue of the patent "semi-prism" pavement-lights and other well-known specialties of the firm.——The Eastern Telegraph Company, Limited, send us a useful little pocket-diary, giving the rates per word

from any telegraph-station in the United Kingdom to the Mediterranean, India, China, Australia, Africa, New Zealand, South America, and other parts of the world, together with several coloured maps.——Messrs. Shand, Mason, & Co., send us an effective little office calendar, printed in colours from a picture specially painted for the firm by Mr. John Charlton. The subject is a steam fire-engine, drawn by a fine pair of dappled greys, and fully manned, hastening to the scene of a fire.——"The Garden Oracle" for 1891 (London: *Gardeners' Magazine* Office) is the thirty-third annual issue of that useful little book, which fully maintains its right to its title. Among the contents is an interesting article on the "Early History of the Chrysanthemum," by Mr. C. Harman Payne. This article is illustrated with numerous portraits of horticulturists, English and foreign, whose names are associated with the European history of this flower.

Correspondence.

To the Editor of THE BUILDER.

"WHO IS RESPONSIBLE?"

SIR,—Can any of your readers inform me who is legally responsible in the following matter:—

An architect prepares drawings and specifications for a house.

With the sanction of the client, the quantities are taken off by a "quantity surveyor."

The "bills of quantities," having been prepared, are sent out, and tenders received from several "builders" for the building.

One of the competitors obtains the contract, of which, however, the "bills of quantities" do not form a part.

The works are carried out.

The "quantity surveyor" is paid by the builder for the "bills of quantities."

At the finish an omission is found to have been made in the "bills of quantities."

The builder claims payment for same.

The "quantity surveyor," whilst admitting the error, pleads non-liability.

The "client" declines to admit liability, on the ground that the contract was to be carried out in accordance with the signed and figured drawings and specifications, and which have been adhered to.

If any of your readers can inform me on whom rests the responsibility in this matter, it will be gratefully acknowledged by— ALPHA.

*** As the law now stands there is no doubt that under the circumstances detailed by "Alpha" the loss must fall on the builder. The law holds that the delivery of bills of quantities implies no warranty of their accuracy; the quantity surveyor is held by the law to be bound by no condition other than that which binds any professional adviser,—lawyer, architect, or engineer, viz.: that he should have brought fair and reasonable skill and care to the work demanded, but that he is not to be expected to be infallible. On the principle of *caveat emptor*, the law would hold that the contractor should himself test the quantities to a certain extent, which is exactly what contractors object to do; not without reason, from their point of view. We have before expressed the opinion that the law on this point is based on a misapprehension of the essential difference between the position of a quantity surveyor and that of a professional adviser, such as an architect. The architect may advise the use of a certain stone, for instance, and if that stone turns out unsatisfactorily and decays, the architect may show that he used his best skill and judgment in selecting it. But the quantity surveyor is asked to calculate how many cubic feet of such stone are required in the work, *i.e.* he has to state a fact, not to give an opinion; and if the architect's drawings are sufficient and clear, stating the correct amount is only a question of correct measurement and arithmetic, which ought always to be possible. In fact, as we have before said, if the quantities are not correct they are not "the quantities." The law, however, does not recognise this distinction; and the builder has no course but to abide by the law.—ED.

ADJOINING OWNERS.

SIR,—I read with considerable interest your article on "Adjoining Owners" under the Metropolitan Buildings Act. The question what constitutes ownership within the meaning of the Act seems to me a fairly clear one, for an Act of Parliament, viz., an occupier or tenant with a holding of more than one year. I have had a large experience of party-walls, and I now always serve the freeholder, leaseholder, and all sub-leaseholders with notices who hold any term above the one year. This, in the City of London, necessitates very often half-a-dozen notices, and there is no objection to this course. The difficulty would arise if the several tenants required a separate award as provided for by the Act. I should like to see a decision of one of the courts on this point. Usually a tenant is only too glad to hand his "registered notice" to his superior landlord and so get rid of an unknown responsibility in the matter. The section of the Act referring to awards requires amending. Would it be too much to ask the London County Council among its many duties to get this clause amplified and made clear?

At the present time, as a "Building Owner's" Surveyor it is necessary to find out who are the several surveyors acting for the "Adjoining Owners," and also to pick up the several notices and get, if possible, the surveyor acting for the superior leaseholder to consolidate the notices and so prepare the way for a single and simple award under the Act.

MARTIN L. SAUNDERS.

GENERAL BUILDING NEWS.

PROPOSED PUBLIC BATHS, BATLEY.—On the 5th inst. a meeting of the Batley Corporation was held in the Town Hall, Mr. John Lodge (Mayor) presiding. The Mayor moved the adoption of a recommendation, passed by the General Purposes Committee, that plans prepared by Mr. W. Hanstock, architect, for public baths, at an estimated cost of 10,000*l.*, be adopted; and that the Town Clerk apply to the Local Government Board for sanction to borrow 10,000*l.* for that purpose. The resolution was ultimately carried.

RESTORATION OF ASTON PARISH CHURCH.—The restoration and enlargement of the Parish Church of Aston has just been completed, and the Bishop of Worcester (Dr. Perowne) consecrated the eastern extension on the 7th inst. The gift by an anonymous donor of a chancel, the Erdington Chapel and organ chamber (with all the windows filled with stained glass and the floors of marble mosaic), has been supplemented by other offerings in order to complete the work at the east end of the church. These consist of a reredos extending along the five sides of the apse; the centre portion of which is divided into three panels canopied and carved, with side buttresses and pinnacles crocketted. The other four sides are divided into panels also canopied, with carved cornices and brattishing. Sedilia are placed in the north and south sides, and a credence shelf on the south side. As regards the sculpture, the centre of the three panels immediately over the Communion table is represented as the Ascension, on the right hand side is the Resurrection, and the left the Transfiguration. At the top of the buttresses dividing the five sides of the reredos are niches, with carved canopies and pinnacles, which contain statues of St. Matthew, St. Mark, Moses, St. Peter, St. Paul, Isaac, and St. Luke. The whole of the work has been executed in alabaster from the quarries near Tutbury, the subjects in panels being of white alabaster. In addition to the reredos, a moulded alabaster altar rail has been added. The whole of the work has been carried out from the designs and under the superintendence of Mr. Chatwin, the architect of the restoration; the work in the reredos has been carried out by Mr. R. Bridgeman, of Lichfield, and the brasswork by Messrs. Thomason, of Birmingham.

THE NEW PUBLIC-HALL SCHEME IN NEWCASTLE.—A meeting of the Newcastle Town-hall and Municipal Offices Committee was held on the 9th inst. The question of Mr. Laing's proposal to convert the present Butcher and Vegetable Markets into a City Assembly-hall was considered. A letter was read from Mr. Laing to the effect that he proposed to have a seventy-five years' lease; the expenditure of a sum of money to be fixed upon for the structural work, to excavate the centre, and place a butter and poultry market underneath the proposed City Hall; to pay a rent equal to the present net rentals obtained from the whole of the shops, and to hand over without any consideration the whole of the new buildings proposed to be erected by him at the termination of the lease. The Committee came to the conclusion that, having regard to the importance to the question, it should be referred to the Council for further instructions as to whether they would be willing to dispose of the present markets.

NEW REREDOS, ALMONDSBURY CHURCH.—There has just been erected in Almondsbury church, Gloucestershire, a new oak reredos. The retable is moulded and carved with vine leaves and grapes, and above this and running the full length of the reredos are three panels of carved tracery. The structure is divided into three bays, the centre portion of which is canopied and groined, with carved patterns at the junction of the ribs. On either side are niches for figures. The canopy consists of traceried panels, divided by carved and crocketted pinnacles, each terminating with carved pendants. Immediately above this tracery there is a carved string-course with shields inserted at equal distances, on which are carved the emblems of the Passion. Over this is a carved cresting. At each division of the three bays are octagonal-shaped and traceried turrets, which are again divided into three portions by small crocketted gables fixed to each face of the octagon, and at each angle of these are heads of various shapes. The turrets are surmounted by a crocketted dome, with a carved finial at the apex. The work has been executed by Messrs. Jones & Willis, of Birmingham, from the designs of the architect, Mr. C. E. Ponting, of Marlborough.

NEW HOUSE AT BUCKLAND, BUCKS.—A house has been completed here for the Rev. Edward Bonus, from the designs and under the superintendence of Mr. Edward Swinfen Harris. The walling is of Blisworth stone, lined internally with brick, the dressings being of Monk's Park and Box Ground Bath stone. The ground floors throughout are covered with Vigers & Co.'s wood blocks. The stone chimneys are very varied in outline and general treatment. There are three reception rooms, each opening internally out of a large hall, which rises to the roofs, and round which the principal staircase is taken. The woodwork in hall and reception rooms is of oak. The south front contains a loggia, into which the sitting rooms all open. The general contractor is Mr. Grist, of Bierton, near Aylesbury.

OPENING OF NEW WING, MONKSTOWN HOSPITAL, DUBLIN.—The new wing of Monkstown Hospital, Dublin, was recently opened. The new wing, which is a brick building, contains two sections—the sanitary and observation. The former is 32 ft. long by 23 ft. deep, is two stories high, and is erected to the rear of the main building. It is fitted with modern sanitary appliances, and contains a mortuary and *post-mortem* room. The second or observation section of the building is 45 ft. long by 18 ft. The works were entrusted to Mr. Henry Pemberton, of Killiney, and Messrs. Maguire, of Dublin. The plans were prepared by Mr. F. A. Butler, architect, Dublin, and the cost of the addition has been about 3,500*l.*

ST. MICHAEL'S CHURCH, COVENTRY.—We are informed that "an addition to the comforts" of the congregation of St. Michael's Church, Coventry, has been effected by the casing of the north door in oak, on similar lines to those existing on the other side of the church. Heavy curtains have also been hung over the porch door and the great west door. These works were entrusted by the churchwardens to Messrs. Jones & Willis.

NEW CHANCEL, ST. MATTHEW'S CHURCH, TWIGWORTH.—The consecration of the new chancel of the Church of St. Matthew's, Twigworth, Gloucester, took place on the 29th ult. The works comprise the removal of a gallery from the west end of the church, the pulling down of the small chancel and the east walls of the nave and north aisle, and the removal of the small vestry. In the place of these, the nave and north aisle have been extended in an easterly direction, and space has been provided for a chancel of fair proportions. The roof of the new part of the north aisle is a continuation of the old roof, but that in the chancel is partly of open timber construction with panelled boarding. The old seats have been lowered, and the backs made to slope; the floors of the whole building have been repaired, and the new floors have been laid with wooden blocks and encaustic tiles. A chancel-screen of pierced and carved tracery work in pitch pine, executed by Mr. H. Frith, of Gloucester, has been erected between the chancel and the nave. Two new painted-glass windows, by Messrs. Clayton & Bell, has been placed in the nave, and the three-light window in the south wall of the chancel is about to be filled with glass from the same firm. The work has been carried out by Mr. W. J. Parker, contractor, of Longford, from the designs of the architects, Messrs. Waller & Son, of Gloucester.

RESTORATION OF THE PARISH CHURCH, MEAVY.—The parish church of Meavy, Devon, has lately undergone restoration, the chancel floor having been taken up and relaid with marble. The immediate steps to the altar are made to a circular sweep on plan, and are composed (as are the whole of the steps) of white Sicilian marble treads and risers. The altar pace is of red Devon, inlaid with circular panel of green Devon (Kitley). The whole of the remainder of the floor is made up of black and white marble squares. The work has been carried out from the plans of Mr. J. D. Sedding, of London, by Messrs. J. & E. Goad, of Plymouth.

NEW PULPIT, ST. STEPHEN'S CHURCH, BRISTOL.—The Society of St. Stephen's Ringers, Bristol, have just provided a new pulpit for St. Stephen's Church. The new pulpit is in the English Gothic style of the fifteenth century; it is octagonal in shape, and of Caen stone. The superstructure is composed of tracery and panel work, with groined niches at the angles. The panels are filled in with blood-red marble, known as Rosso Antico, from the old Roman quarries on the north coast of Africa, and the circular bosses between the canopies are of similar marble. The body of the pulpit stands upon groined stone work also of octagonal shape, the intersection of the several ribs being carved with natural foliage; below this is a group of eight shafts alternately of polished Purbeck and Ipplepen marble, each shaft being girt with a band of Mansfield stone. The shafts rest upon a circular base of red Devonshire marble, and this stands on a foundation of blue pennant stone. The interior of the pulpit is lined with English oak, and the steps from the chancel to the pulpit will be provided with a brass railing. The figures which stand at the several angles of the pulpit are of white alabaster from the quarries of Staffordshire

and each figure occupies a place in a niche, the base of which is borne by angels with outspread wings and uplifted hands. The central figure is that of Our Lord as the Good Shepherd. The other figures represent St. Stephen (the patron saint of the church), St. Joseph of Arimathea, St. John the Baptist, St. John the Divine, St. Peter, and St. Paul. The designs for the new pulpit were prepared by Messrs. Pope & Paul, architects, Bristol, and the work was executed by Mr. Harry Hems, of Exeter. The cost of the pulpit was 350*l.*

SANITARY AND ENGINEERING NEWS.

EXAMINER OF PLUMBERS' WORK, CITY GUILDS' INSTITUTION.—We are informed that Mr. John Smeaton has been elected examiner of Plumbers' Work at the City and Guilds of London Institute. The appointment, we understand, is tenable for five years, subject to annual re-election.

THE SANITARY ASSURANCE ASSOCIATION.—The tenth annual meeting of this Association was held on Monday last at the offices, 5, Argyll-place, W., the President, Sir Joseph Fayrer, in the chair. Mr. Joseph Hadley, Secretary, read the annual report, which referred to the work of the Council in promoting the Sanitary Registration of Buildings Bill, and said:—"At the opening of the Session of 1891 the Queen's Speech contained the welcome announcement that Her Majesty's Government had a sanitary measure in preparation, and therefore the Council passed the following resolution:—

"That the Council of the Sanitary Assurance Association learns with satisfaction from the Queen's Speech that the Government have in preparation a Bill for consolidating and amending the laws relating to Public Health; that a memorial be presented to the Prime Minister, urging the Government to incorporate in their Bill for consolidating and amending the Public Health Acts, the essential features of the Sanitary Registration of Buildings Bill."

A memorial has been accordingly prepared for presentation to the Marquis of Salisbury. The income of the Association for the year 1890 was 469*l.*, and, after meeting all liabilities, a balance was carried forward. On the motion of the President, seconded by Mr. Henry Rutherfurd, barrister-at-law, the report was unanimously adopted. Surgeon-General Cornish proposed the following resolution:—

"That the petition to the Prime Minister requesting the Government to make such provision in their Bill for consolidating and amending the laws relating to public health, as will secure the registration of buildings in some such manner as proposed by the Sanitary Registration of Buildings Bill, 1890, be approved, and that copies be forwarded to the governing bodies of the Institutions which took part in the Sanitary Registration Conference of 1887, with a letter requesting them to sign the petition, and take part in its presentation."

This was seconded by Mr. Andrew Stirling, and supported by Mr. Mark H. Judge and Dr. Willoughby, and carried unanimously. Sir Joseph Fayrer having some time since announced his intention of retiring from the presidency of the Association, having held the position for ten years, on the motion of Mr. Rutherfurd a hearty vote of thanks was accorded to him for the services he had rendered to the cause of sanitary improvement generally, especially in connexion with the work of the Sanitary Assurance Association. — Surgeon-General Cornish, the Sanitary Commissioner with the Madras Government, was then elected President of the Association, and Sir Joseph Fayrer and Professor Roger Smith Vice-Presidents. Lord Henry Bruce, M.P., and Professor Roger Smith were re-elected members of the Council.

SEWERAGE OF WHITCHURCH (SOMERSETSHIRE).—The Keynsham Rural Sanitary Authority have adopted the report of Mr. A. P. I. Cotterell, Assoc.M.Inst. C.E., Bristol, upon the sewerage and sewage disposal of Whitchurch, and have instructed him to prepare the necessary plans and estimates for the Local Government Board.

CLONMEL WATERWORKS.—A Local Government Board inquiry was held on the 3rd inst., at Clonmel, in Ireland, with reference to an application from the Corporation for a Provisional Order for the purchase of lands and a loan of 14,437*l.* 10*s.* for the construction of waterworks. Mr. Cotton, C.E., Local Government Board Inspector, conducted the inquiry. The Corporation advertised an open competition for the best scheme, and, acting under the advice of a London assessor, they finally selected the plan prepared by Mr. W. H. Radford, C.E., of Nottingham, and engaged him to superintend the works. Mr. Radford explained the plans and scheme. One acre of land was required for a service reservoir, a small quantity of land for the water intake, certain mill water rights, and rights of way. The present water supply is from shallow wells, very liable to contamination and very hard. A public supply is required for fire-extinction, sewer-flushing, closets, baths, domestic use, and trade purposes. The population to be supplied is 12,000, and the estimated quantity required is 225,000 gallons a day, but much more than this can be supplied. The water will be taken from the Glenmorgan mountain stream, about three miles from the town. There is a watershed of 1,700 acres on the Old Red Sandstone, chiefly moorland and mountain farms. There are many constant springs above the intake. The water is described as soft and pure, and it is stated that there will be an ample supply of water in the stream from day to day in the driest summer, and therefore no impoundage is necessary.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOWS, ELSWICK-ROAD CHAPEL, NEWCASTLE.—Four memorial windows have just been placed in Elswick-road Wesleyan Chapel, Newcastle. Each window contains one large figure. The subjects were designed by Miss Kate Stephenson, and stained by Messrs. Atkinson Brothers, of Newcastle.

MEMORIAL WINDOW, CHURCH OF ST. MARY, BATHWICK.—The memorial window to the Rev. Prebendary Scarth, which has been placed in the parish church of St. Mary, Bathwick, Somerset, was unveiled on the 1st inst., by the Mayor of Bath, Mr. Jerom Murch. The window, which is in the north aisle, near the organ, is by Messrs. Clayton & Bell. The figures of the Twelve Apostles are represented.

FOREIGN AND COLONIAL.

FRANCE.—A special exhibition of the works of Meissonier, at the École des Beaux-Arts is talked of. Many owners of his works have offered to lend them for the occasion.——The exhibition of lady artists will be opened at the Palais d'Industrie on the 21st; and the annual exhibition of the "Independent Artists" on the 20th of March, at the Ville de Paris Pavilion on the Champ de Mars. — The Académie des Beaux-Arts has elected M. Bailly (architect) as president in place of Meissonier, and M. Paul Dubois (sculptor) as vice-president in place of M. Bailly.——The death is announced at Versailles of M. Alfred Rozat de Mandres, a retired Inspecteur-General des Ponts et Chaussées. This distinguished engineer was born in 1815 at Vic-sur-Seille, and carried out some remarkable works at Paris, especially the lowering and covering over of the Canal St. Martin on the site now known as the Boulevard Richard Lenoir. The archives of the Ponts et Chaussées contain various interesting papers and memoranda by him on the subject of proposed sanitary and engineering improvements to Paris.——A painter who obtained some success in various salons, M. Jean Benouville, is dead at the age of 76. He was a pupil of Picot and painted what may be called historic landscapes, one of which gained him the medal of honour of the Salon. The committee formed to raise subscriptions, at Charleville and Sedan, for the memorial to soldiers who fell at Sedan in 1870, has received a considerable sum from London as the contribution of Frenchmen resident in the English capital.——The Académie des Beaux Arts is considering the subject of the possible restoration of the Church of St. Jouin-des-Marnes (Vienne), a sumptuous monument of the eleventh and twelfth century, the facade of which presents some very fine sculpture.——There is also talk of carrying extensive repairs to the celebrated Church of Soulac (Gironde). Soulac, which is a bathing station at the extremity of the department of Medoc possessed a Romanesque church which, about twenty-five years ago cleared out in the dunes.——The Ministry of Fine Arts has commissioned from M. Adolphe Appian, a well-known landscape-painter of Lyons, a large picture for the decoration of the new Prefecture of Lyons.——A special exhibition of the drawings and designs of M. Laisne, the architect recently deceased, is spoke of; to be in the large hall of the Cercle *de la* Librairie, Boulevard St. Germain.——The collections of the late M. Eudoxe Marcille are not to be sold, but one picture from the collection, "L'Ame," by Prudhon, has been offered to the Orléans Museum.——There is some talk of the rebuilding of the Palace of St. Cloud, which would then become the summer residence of the President of the Republic, in place of Fontainebleau, which is too distant from Paris.

NORWAY.—The second committee appointed to consider the designs for the new Opera-house at Christiania, to which we have previously referred, these being the designs of Herr H. Bull and Herr H. Berle under consideration has given the commission to the former architect.

THE ENGLISH IRON TRADE.—The English iron market continues very quiet. The amount of actual business that is being put through is yet exceedingly small, buying being still only for pressing wants. At the same time the market keeps steady, and the confident tone shown by producers is no doubt due to the fact that they are taking a reasonably hopeful view of the future. There have been some slight fluctuations both in warrants and pig-iron sold to consumers, but there are no actual reductions from last week's prices, makers upholding their quotations pretty firmly, being encouraged in their attitude by better shipments. Finished iron and steel are very quiet, and the competition for steel orders especially is very keen. Still, rates do not change much, manufacturers being unable to make concessions owing to the high cost of raw materials and fuel. There are no changes in the shipbuilding and engineering trades, which keep fairly well employed.—*Iron.*

MISCELLANEOUS.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting of this Society on Wednesday, the 4th inst., Mr. W. de Gray Birch, F.S.A., in the chair, Mr. J. M. Wood exhibited a series of Roman earthenware vessels and fragments which have recently been found at Colchester outside the circuit of the Roman walls. Among these were some portions of vessels of Samian ware, having patterns of great beauty, and the handle of an amphora inscribed with N and T conjoined, and the name C ANTONI. . . Mr. Way pointed out that some of the patterns on the Samian ware were identical with several found in London. Mr. Way exhibited a curious nutcracker of early seventeenth-century date, having a man's face in front, together with various articles found in recent excavations at the corner of Godliman-street, St. Paul's. Also a cannon-ball of early date which has been found at Tiverton, having a link to attach it to another ball, after the manner of modern chain-shot. It is probably a relic of the times of the civil wars. The second part of a paper by Mr. Macmichael on the early signs of the tradesmen's shops of the City of London was then read. Many of these signs were of historical interest, derived from the heraldic bearings of powerful families, or were allegorical, or illustrative of special events. Sometimes they had a comic meaning or had punning reference to the name of the founder of the business, the booksellers' shops being numerous, and having a goodly array of signs. The section of the paper read treated of the central portion of the City, the eastern part being reserved for another occasion. A large series of illustrative drawings from the collection of Mr. H. Syer Cuming, F.S.A., were exhibited by the lecturer.

THE REGISTRATION OF PLUMBERS.—Mr. Burdett-Coutts, M.P., presided at a public meeting held in the Burdett-Coutts Hall, Westminster, on the 3rd inst., whereat the Baroness Burdett-Coutts presented the prizes and certificates of merit awarded by the Worshipful Company of Plumbers to the students in the plumbing classes at the Townshend Endowed Schools. There was a large attendance, including Mr. W. H. Bishop (Master of the Plumbers' Company), Mr. Chas. Hudson (Warden), Mr. Philip Wilkinson, F.R.I.B.A. (Renter Warden), Mr. Alderman Knill (Past Master), Mr. F. Machin (Past Master), Sir Philip Magnus, Mr. John Smeaton, Miss Cons, Miss Lankester (Sec. National Health Society), Mr. C. T. Millis (Technical Instructor), Dr. Dudfield (Medical Officer, Kensington), Mr. W. Titmas, Mr. G. Clegg, Mr. R. A. Nurse, Mr. J. Browning, and a number of other master and operative plumbers. Mr. Burdett-Coutts having opened the meeting, Mr. W. H. Bishop (Master of the Worshipful Company of Plumbers) gave details of the origin and progress of the registration movement, and stated that there was an increasing demand for registered plumbers, not only in all parts of the United Kingdom, but in the Colonies and abroad. Sir Philip Magnus moved a vote of thanks to the Baroness, which was seconded by Mr. Tomlinson, M.P., and carried. Mr. J. Marsden, of the St. Stephen's Institute, then moved:—

"That this meeting desires to record its opinion that it is essential to the health and comfort of all classes of the community that the plumber's craft should be brought under such systematic regulation and control as to insure the efficient training of its members, and that this can be best effected by the system of National Registration, which requires plumbers to pass qualifying examinations; and the meeting further desires to direct the attention of Parliament to the necessity for legislative enactments to effect these objects."

Mr. Alderman Knill seconded the motion, which was carried, as were votes of thanks to the Plumbers' Company and to the chairman.——The first annual public meeting of the Ulster District Council for the National Registration of Plumbers, has been held in the Council Chamber, City Hall, Belfast, the Mayor in the chair. The Secretary (Mr. W. Morton) submitted the annual report, which stated that "of thirteen towns in Ulster, containing upwards of 5,000 inhabitants, nine have now at their disposal the services of duly qualified men certified by the Worshipful Company of Plumbers, London. These towns are as follows:—Armagh, Ballymena, Belfast, Enniskillen, Coleraine, Lisburn, Lurgan, Newtownards, and Portadown." In the course of the proceedings, Mr. Bretland (City Surveyor of Belfast) referred to the introduction of by-laws with regard to the sanitation of Belfast. The Corporation and the Water Commissioners had inaugurated a new era so far as the erection of buildings was concerned. He had, in his official capacity, recently observed that there was less trouble in getting what they considered the proper thing than that which was not permitted under those by-laws. That was partly attributable to the installation in Ulster of the National Association of Registered Plumbers, which, he hoped, would go on prospering in their midst.

A NEW ATLAS.—Messrs. Cassell & Co. announce a new atlas to be published by them in twenty-eight monthly parts, at a cost of one shilling per part. We have seen no specimen map as yet, but if it fulfils all that is promised it will be a valuable work for the price at which it is offered.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Hospital	Poplar Hospital Com.	Not stated	Feb. 24
*Technical School, Rochdale	The Committee	50l. and 20l.	Apl. 11
*Covered Market, Arcades and Shops, Halifax	Markets and Fairs Committee	100l. 50l. and 30l.	May 1
*Board School	Chadwell St. Mary School Board	Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Cleansing, &c. and Keeping in Repair, Southwark Bridge	Committee for Letting Bridge House Estates	*Official*	Feb. 16
Sanitary Pipes, Firestone, &c.	Darlington Corporation	do.	Feb. 17
*Removal of Dust, &c.	Lambeth Vestry	H. McIntosh	do.
*Making-up Roads	Rotherhithe Vestry	E. Thomas	do.
Two Houses, Builth Wells	Evan Evans	Telfer Smith	do.
Dychouse, Providence Mills, Wakefield	G. Lee & Sons, Lim.	William Watson	do.
Fire-clay Retorts, Fire Bricks, &c.	Leeds Corporation	*Official*	Feb. 18
Wet and Dry Gas Meters	do.	do.	do.
New Schools and Master's House, East Stanley	Tanfield School Board	Davidson & Beadle	do.
Paving Setts (large contract)	Halifax Corporation	E. R. S. Escott	do.
Transit Warehouse, Middlesbrough Dock	N. E. Railway Co.	William Bell	do.
*Masons' and Paviors' Work	Westminster Vestry	G. H. W. Wheeler	do.
New School Buildings, Dewsbury	Govr's Wheelwright Grammar Schools	J. Lane Fox	do.
Short Railway Line, Hartlepool	Martin & Fenwick		Feb. 20
Taking-down and Re-building Inn, Pellon-lane, Halifax		Jackson & Fox	do.
*Alterations and Additions to Infirmary	Salisbury Infirmary	J. Harding & Son	do.
Church, Barry Dock, Glam.	Rev. J. Heney	Seward & Thomas	do.
Paving Iron Castings, &c.	Birmingham Corporta	W. S. Till	do.
Transit Shed, Avonmouth Dock	Bristol Corporation	J. M. McCurrich	do.
Four Houses, Lincoln-road, Peterborough		J. G. Stallebrass	do.
*Works, Materials, &c.	Surbiton Impt. Com.	*Official*	Feb. 21
100 Cottages, Aberdare Junction	Carnetown Cottage Co. Lim.		do.
Church, Ashington, Northumberland	J. W. Sweet		do.
25 Cottages, Consett, Blackhill, co. Durham	Consett Iron Co. Lim.		do.
*Supply of Materials	Hendon Local Board	S. S. Grimley	Feb. 23
*Works and Materials	Mortlake Highway Bd.	H. Richards	do
Mission-room, Class-rooms, Caretaker's House, &c. Hunslet, Leeds		Geo E. Danby	do.
Under Frames, &c for Carriages	India Office	*Official*	Feb. 24
*Waterworks, Teveral	Mansfield U.R.S.A.	G. Hodson	do.
*Roadmaking and Paving Works	Willesden Local Board	O. Claude Robson	do.
*Works and Materials	do.	do.	do.
*Works and Materials	Sheffield Town Coun.	C. F. Wike	do.
Sewerage	Dundalk Twn Comms	J. Gaskin	do.
*Works and Materials	War Department	*Official*	Feb. 25
*Fire Brigade Station	Chiswick Local Board	A. Ramsden	do.
*Paving Works	Hackney Board of Works	J. Lovegrove	do.
Road from Tredegar to Argoed	Tredegar Local Board	G. A. Lundie	do.
Road from Tredegar to Argoed	Bedwelty U.R.S.A.	do.	do.
10 Houses and Shop, Hopwood-lane, Halifax		George Buckley & Son	do.
Retort House, Boiler House, &c.	Cirencester Gas Co.	Thos. Newbigging	do.
*Cleaning and Watering Streets, &c.	Chiswick Local Board	A. Ramsden	do.
*Works and Materials	Hammersmith Vestry	H. Mair	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	Architect, Surveyor, or Engineer.	By whom Required.	Tenders to be delivered.
*Foundation Works, Asylum	Dorset County Lunatic Asylum	G. F. Hine	Feb. 26
*Works and Materials	Lambeth Vestry	H. McIntosh	do.
*Works and Materials	Vestry of St. Mary, Islington	*Official*	Feb. 27
Gasholder Tank	Ashton-under-Lyne Gas Co.	David Clarke	Feb. 28
Wrought-iron Work, Steam-pipes, &c.	Stafford Corporation	W. Blackshaw	do.
Farm House and Buildings, Hope, Flint	Lnestr's Charity Trees	J. Whalley & Son	do.
Additional Aqueduct, Loch Katrine	Glasgow Corporation	Mr Gale	do.
*Building Materials	War Department	*Official*	Mar. 2
*Infectious Diseases Hospital	Borough of Blackburn	do.	do.
*Isolation Hospital	Brentford Local Board	J. H. Strachan	do.
*Sewerage Works	Hornsey Local Board	T. de Courcy Meade	do.
*Making-up of Private Roads	do.	do.	do.
*New Isolation Block at Hospital	do.	do.	do.
*Foreman's House at Highgate Depôt	do.	do.	do.
*Works and Materials	do.	do.	do.
*Making up Roads	Acton Local Board	W. J. Ebbetts	Mar. 3
*Escape Staircases	Wandsworth and Clapham Union	T. W. Aldwinckle	Mar. 5
*Works and Materials, Weymouth Sub-District	War Department	*Official*	Mar. 6
*Making up Road	Wanstead Local Board	do.	do.
Hotel Work, Limerick	James Flyon	Robert Fogarty	do.
Harthill Stone Road Metal, &c.	Brockley Highway Bd.	W. J. Treadwell	Mar. 7
*Works and Materials	War Department	*Official*	Mar. 9
*Works and Materials, Shorncliffe Sub-District	War Department	do.	Mar. 10
*Works and Materials	Metropolitan Asylum Board	do.	
Restoration of Parish Church, Hilton, near Blandford		W. Fletcher	Mar. 14
Wesleyan Chapel and Schools, Park-view, Guiseley		Herbert Isitt	No date
Two Villas, Usk	Mr. Boulton		do.
New Buildings, Blackett-street, Newcastle-on-Tyne	Thomas Cooke	Jas. T. Cackett	do.
New Premises, Battle Hill, Hexham	Dr. T. Stainthorpe	Henry Greves	do.
Miners' Hall, Institute, &c. Usworth Colliery, Co. Durham		Davidson & Beadle	do.
Bishop Lightfoot Memorial Church, Gateshead		Stephen Piper	do.
Rebuilding Workshop, Victoria-road, Leeds	Wilson Bros.		do.
15 Cottages, Hunslet, Leeds	Clayton, Son, & Co. Lim.		do.
Wesleyan Chapel, Cudworth, Oldham		Dixon & Taylor	do.
Cast Iron Rising Main, &c.	Wolstanton & Burslem, S.S.A.	Geo. B. Ford	do.
*Various Works, Kidsgrove, Staffs.	Clough Hall Park, &c. Co. Lim	Jas. Stevens	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Second-class Assistant Surveyors	Civil Service Com.	Not stated	Feb. 6
*Building Inspector	Hornsey Local Board	32 3s. 0d.	Feb. 17
*Surveyor	Stroud Local Board	150l.	Feb. 18
Sanitary Inspector	Camberwell Vestry	250l.	Feb. 24
*Assistant, City Surveyor's Department	Carlisle Corporation	130l.	No date

Those marked with an Asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xx. *and* xxi.

LIVERPOOL ENGINEERING SOCIETY.—The sixth ordinary meeting of this society for the present session was held at the Royal Institution, Colquitt-street, on the 4th inst., Mr. Ferdinand Hudleston, Assoc.-M.Inst.C.E., President, in the chair.—Mr. Arthur J. Maginnis, M.I.N.A., exhibited and explained the mode of working of a new electric automatic bridge indicator for steamships.—Mr. Joseph Boult then read a paper entitled "Notes on the Phenomena of Tidal Rivers, with Special reference to the River Mersey." In the course of the paper, Mr. Boult dealt with the differences between tidal and non-tidal rivers, with the amount of tidal sea-water entering the Thames and the Mersey respectively, and the difference in tidal range between the West Coast of Britain and the East Coast of Ireland, and the cause of this difference. The various phases of the tides in the tidal channels at the mouth of the Mersey were next discussed, together with the numerous movements of the channels of the Upper Estuary. The Great Fret in the banks of the Upper Estuary was described, and conclusions drawn from the examination of the monthly Surveys showing the position of the navigable channel. The paper was brought to a conclusion with various suggestions for the improvement of the estuary of the river.

"BABYLONIA:" A NEW FIRE-RESISTING PAINT.—Messrs. Aspinall, of New Cross, who are so well-known for their "Enamel" paints, are introducing a new fire-resisting paint which is called "Babylonia." Judging by some experiments which we witnessed in the grounds of Ranelagh House, Fulham, on the 6th inst., it promises to be very useful in resisting a fire until aid can be summoned. It consists both of a paint and a "priming,"—the latter being transparent, and capable of being used for coating floors, doors, or other woodwork where it is not desired to conceal the grain of the wood. The paint and the "priming" can be used either singly or in conjunction. In the experiments which we witnessed, in fact, the test with the "Babylonia" paint-protected hut seemed, if anything, more successful than the test with the hut which was coated with both the priming and the paint. The two huts thus differently prepared, were roughly speaking, structures about 5 ft. wide by 6 ft. long, by 6 ft. 6 in. high, built of stout inch boards, in the one case painted, and in the other case primed and painted, inside and out. These huts so protected were tested with a third, of exactly the same size and construction, but painted inside and out with ordinary oil paint. One end of each hut was left quite open. The test applied consisted in burning a sack of shavings in each hut or receptacle. In little more than ten minutes the fires in each of the protected huts had quite spent themselves, and the woodwork remained intact. The structure of the third hut, however, was speedily in full blaze, and, after burning for more than an hour, was totally consumed. Other tests of the fire-resisting properties of "Babylonia" were made at the same time.

LONDON AND COUNTY BANKING COMPANY, LIMITED.—The report for the half-year ending December 31 last, adopted at the annual general meeting held on the 5th inst., shows that, after paying interest to customers and all charges, making provision for bad and doubtful debts, allowing 58,192*l.* 14s. 8d. for rebate on bills not due, and transferring 20,000*l.* in reduction of premises account, the net profits amount to 232,492*l.* 8s. 9d. This sum, added to 61,901*l.* 7s. 2d., the balance brought forward from last account, produces a total of 294,393*l.* 15s. 11d. The directors recommended the payment of a dividend of 11 per cent. for the half-year, which will absorb 220,000*l.* This will leave a balance of 74,393*l.* 15s. 11d. to be carried forward to profit and loss new account. The present dividend added to that paid to June 30 makes 22 per cent. for the year 1890. This bank joined to the extent of 750,000*l.* in the guarantee entered into by the Bank of England and other banks in regard to the affairs of Messrs. Baring Brothers & Co.

BRISTOL SOCIETY OF ARCHITECTS.—On the 9th inst., Mr. John Slater, B.A., of London, delivered a lecture to the members of the Bristol Society of Architects. Mr. Henry Crisp presided, and introduced Mr. Slater, who based his remarks on "Architectural Education." He pointed out that thirty years ago, if a man was a skilful draughtsman it was considered that he did not require much more to make him a good architect. Now, although there was a great tendency to disregard those things which their forefathers used and held in respect, there was an increasing conviction that the theories of the old Roman writer, Vitruvius, were not very wrong. Mr. Slater pointed out the danger architects were in of being crowded out by engineers, and spoke of the steps which were taken by the Royal Institute of British Architects in view of increasing the attention to the education and training of architects.

NEW STATUE, BRIDGERULE PARISH CHURCH.—An offering to the church of St. Bridget and St. Michael, Bridgerule, Devonshire, has just been made and has assumed the form of a statue of St. Bridget, carved in grey Polyphant stone—a material much used in the construction of the original church. Mr. Harry Hems, of Exeter, was commissioned to carry out the work, and this he has just completed. The new sculptured figure represents St. Bridget in the habit of an abbess, with a crozier in her left hand and a bunch of oak-leaves and acorns in the other.

SURVEYORS' INSTITUTION.—At the next meeting of this Institution, to be held on Monday evening next, a paper will be read by Mr. A. A. Hudson (Associate), entitled "Recent Legislation as to Buildings and Streets in London."

FREE LECTURES TO ARTISANS AT CARPENTERS' HALL.—The first of a series of free lectures to artisans and others was delivered on Wednesday evening last at the Carpenters' Hall, London-wall, by Professor H. Robinson, M.Inst.C.E., his subject being "Sanitary and Insanitary Dwellings." The chair was taken by Sir John Coode, K.C.M.G., and the lecture was listened to with evident interest by a large audience which filled every part of the hall.

STREET-CLEANING IN AMERICA.—The cost of cleaning the streets of New York is to be 1,584,250 dols. this year. The money appropriated for the purpose has been steadily increasing since the year 1882, when it was 1,010,000 dols. Last year the sum of 54,709 dols. was recovered by the sale of garbage and selected sweepings. In Baltimore a syndicate of business men of the city has proposed to perform all the duties of the street-cleaning department in a more effective manner than heretofore for 175,000 dols. per annum for five years. This is 100,000 dols. less than it cost the city in 1889. The syndicate offers satisfactory bond that it will carry out its contract, and expects to make a profit by help of the sale of refuse matter collected. The population of the city of Baltimore was between 300,000 and 400,000 when the tenth census was taken. Probably it now exceeds the latter figure.

MEETINGS.

SATURDAY, FEBRUARY 14.

Architectural Association.—First Sessional Visit, to Messrs Hobbs's new buildings, Salisbury-street, Strand. 3 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." I. 3 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." II. 4.15 p.m.

MONDAY, FEBRUARY 16.

Royal Institute of British Architects.—Mr. J. Starkie Gardner on "Wrought-iron Work: The Mediæval Period." 8 p.m.

Surveyors' Institution.—Mr. A. A. Hudson on "Recent Legislation as to Buildings and Streets in London." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. Gisbert Kapp on "The Electric Transmission of Power." I. 8 p.m.

University College (Archæology).—Mr. W. St. Chad Boscawen on "Babylonian Archæology and Art." 7 p.m.

Liverpool Architectural Society.—Paper by Mr. H. W. Keet, entitled "A Ramble to Rome." 7 p.m.

Leeds and Yorkshire Architectural Society. — Mr. J. S. Corder, on "The Timber-framed Buildings of East Anglia." 7.30 p.m.

TUESDAY, FEBRUARY 17.

Institution of Civil Engineers.—Further Discussion on Messrs. Llewelyn B., and Claude W. Atkinson's paper on "Electric Mining-Machinery." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor W. H. Corfield, M.A., on "Sanitary Appliances." 8 p.m.

Statistical Society.—Dr. Arthur Newsholme on "The Vital Statistics of Peabody Buildings and other Artisans' and Labourers' Block Dwellings." 7.45 p.m.

Manchester Architectural Association.—Mr. J. A. Hotch on "The Renaissance in Northamptonshire." 7.30 p.m.

Glasgow Architectural Association.—Mr. G. S. Aitken, F.S.A., Scot., on "Architecture in Relation to Social Problems." 8 p.m.

WEDNESDAY, FEBRUARY 18.

Free Lectures to Artisans and others on Matters Connected with Building.—Professor T. Roger Smith on "Failure of Buildings." Carpenters' Hall, London-wall. 7 p.m.

Society of Arts.—Colonel Sir Charles Wilson, R.E.S., on "Methods and Processes of the Ordnance Survey." 8 p.m.

Civil and Mechanical Engineers' Society.—Mr. M. Pinning on "High Pressure Fire Mains." 7 p.m.

British Archæological Association.—1. Dr. Alfred C. Dryer on "Discoveries at Mitchelsdean." 2. Mr. H. S. Fleming, F.S.A. (Scot.), on "Syllabub and Syllabub Vessels." 3. Mr. A. Oliver on "Ancient Brasses in the City of London." 8 p.m.

THURSDAY, FEBRUARY 19.

Society of Antiquaries.—8.30 p.m.

FRIDAY, FEBRUARY 20.

Architectural Association.—Messrs. G. C. Horsley and C. R. Spence on "Marble and Mosaic." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Wright Clarke on "Details of Plumbers' Work." 8 p.m.

Royal Institution.—Dr. E. M. Klein, F.R.S., on "Infectious Diseases, their Nature, Cause and Mode of Spread." 9 p.m.

Society of Arts (Popular Afternoon Lectures).—Captain Abney, F.R.S., on "The Science of Colour." 4.30 p.m.

Junior Engineering Society.—(1) Mr. J. B. Ball, on "Carriage-way Pavements in Large Towns and Cities." (2) Mr. A. Wollheim, on "The Design and Construction of Sewage Precipitation Works." 8 p.m.

Institution of Civil Engineers.—Students' Visit to the Tower Bridge Works, Tower-hill, E. 2 p.m.

SATURDAY, FEBRUARY 21.

Royal Institution.—The Right Hon. Lord Rayleigh, D.C.L., F.R.S., on "The Forces of Cohesion." II 3 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." III. 4.15 p.m.

Edinburgh Architectural Association. — Visit to Register House.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

18,609.—DRYING BRICKS: *J. Bond.* The waste heat and gases escaping from the boiler flue and exhaust steam, is, according to this invention, collected and concentrated by means of a flue and radiators. Then, with great circulating force, the heat is carried entirely through the drying chambers, the circulation carrying at the same time all steam and moisture arising from the materials to be dried.

579.—TESTING AND REPAIRING DRAIN-PIPES: *W. Seymour.*—In order to prevent the trouble of taking up floors, the joints are, according to this invention, made good by pressing Portland cement through a U-shaped tube by pistons.

3,231.—FLUSHING APPARATUS: *W. H. Hawkins.*—An air-tight tank or cistern of suitable size and shape has a supply-valve fitted at the bottom and the same fittings also contains the discharge-valve. As water flows into the tank the air is compressed to a pressure corresponding with that in the main; on the discharge-valve being opened the water is forcibly ejected, and the water having escaped the discharge-valve drops into the seat and the tank refills. The chief advantage is that no small tap or fittings of any kind are required inside the tank.

6,237.—WINDOW SASHES: *T. Jones.*—According to this patent, mechanical appliances are arranged within the window-frame for suspending, locking, fastening, and unfastening the sashes. The sashes have no weights, but slide up and down by means of rack and pinion gear.

14,597.—WINDOW SASHES: *T. Carn.*—In order that the sashes may be readily reversed, the sash is mounted in side pivots, supported in sliding bars working in the sides of the window-frame, so that the sash can be swung on its pivots free of the beads of the frame. The paths and sash are locked together so that in their normal position they all move up and down as one. This is effected by tongues inserted in matching grooves.

17,782.—FLOORING OR WALL-COVERING: *H. Silver and Others.*—According to this invention an article of manufacture, designed as a substitute for wall-paper, flooring &c., is made of two or more strips of thin wood veneer cemented on a backing of cloth or paper. It is made either flat or corrugated as desired.

18,459.—FIRE AND WEATHER-PROOF ROOFING: *C. Schaender (Germany).*—Very elaborate directions are given for the construction of roofs of timber with layers of cement and paper covered over with a layer of coal-ashes finely sifted or fine sand.

18,468.—ARTIFICIAL STONE: *Fr. Jurschina and R. von Ritter (Germany).*—The composition is a mixture of more or less finely ground quartz sand or flint gravel, tripoli and Portland, made with a solution of soda, water, and glass into a paste or plastic mass that can be pressed or cast in moulds.

19,141.—DOOR-HINGES: *H. Faulhaber.*—The door is provided with a device comprising a pivot mounted on a slide or foot-plate, which is slid into and secured on the door by means of screws.

NEW APPLICATIONS FOR PATENTS.

January 26.—1,403, C. Pfister and J. Schmidt, Flushing Cisterns.—1,429, B. Edwards, Latch.

January 27.—1,433, A. Thomas, Sash Fasteners.—1,435, W. Bodin, Flushing Apparatus.—1,449, A. Ward, Fireproof-floors, Staircases, and Roofs.—1,469, E. Leon, Water-closets.—1,471, J. Henderson, Window-sashes and Frames.

January 28.—1,529, E. Drummond, Fastening Door-knobs or Handles to Spindles.—1,553, W. Jackson, Movable Decorated Door-panels.

January 29.—1,601, T. Whittaker, Presses for making and pressing Bricks, Tiles, &c.—1,617, J. Garrett, Kiln for burning Portland Cement, &c.—1,627, R. Foulkes and others, Fixing Tiles in Fire-grates, &c.—1,632, T. Tulloch, Glazing without Sash-bars or putty.—1,666, B. Madler. Door Checks.

January 30.—1,698, C. Duffield, Tunnelling.—1,747, J. Bowles, Saws. — 1,750, C. Forell, Artificial Roman Cement.

January 31.—1,767, J. Trick, Lock Ventilating Sash-fastener. — 1,816, H. De Lastelle, Construction of Buildings.—1,834, W. Horn, Screen Door.

PROVISIONAL SPECIFICATIONS ACCEPTED.

19,975, A. Clifford, Ventilators for Chimneys.—20,151, T. Hollies, Sash or Door Fastener.—201, W. Hyland and W. Chissord, Locking Sash-frames and Preventing them from Rattling.—20,321, J. Swann, Cowl or Ventilator.—20,717, J. Chorlton and G. Scott, Step-ladders.—20,763, A. Attwood and R. Jackson, Revolving Wood Shutters.—21,150, H. Haes, Levelling Staves.—418.—T. Armitage, Sign Boards.—462, A. Binnie, Stoves and Fireplaces.—548, G. Lyons, Sliding Windows.—570, T. Davey, Metal facing.—716, C. Vasmer, Ventilating and Heating Rooms.—789, J. Gibson, Window Sashes, Frames, &c.—832, J. Martin, Raising and Lowering Sash Windows.—839, A. Hunter, Sash Lifter and Fastener for Windows.—900, W. Wade, Tiles.—1,115, W. Taylor, Manufactre of Cement.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

2,223 and 2,244, J. Rendle, Glass Roofing.—3,985, G. Moller, Kilns for Burning Bricks, &c.—4,718, A. Govan, Hanging Window-sashes.—4,738, S. Haslam, Window Sash and Frame.—4,785, A. Stalker and another, Valves for Water-closet and other cisterns.—5,899, T. Robinson, Wood-planing and Moulding Machines.—11,893, A. and J. Tilton, Sash Movements without cords or weights.—20,251, L. Trevisaro, Furnaces for Burning Bricks, &c.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

FEBRUARY 3.—By *F. Jolly & Co:* 92, High-st., Plaistow, u.t. 68 yrs., g.r. 5*l.*, r. 45*l.*, 500*l.*; 158, Packington-st., Islington, u.t. 45 yrs., g.r. 7*l.*, 500*l.*; 155, Ferndale-rd., Brixton, u.t. 60 yrs, g.r. 7*l.* 10*s.*, r. 28*l.*, 205*l.*

FEBRUARY 5.—By *Beard & Son:* 3, Clydesdale-rd, Bayswater, f., rates 17*l.* 10*s.*, r. 65*l.*, 570*l.*; 37 and 39, Colville-gardens, u.t. 95 yrs, g.r. 70*l.*, r. 400*l.*, 2,600*l.*; Colville Sq.-mews, f.g.r. of 30*l.*, with reversion in 76 yrs., 730*l.*; Nos. 1 to 4, Colville Sq.-ter., f., 2,500*l.*; Colville Houses, f., 685*l.*: 132 and 134, Portsdown-mansions, Maida Vale, u.t. 68 yrs., g.r. 42*l.*, 2,100*l.*—By *Foster & Cranfield:* 30, Chapel-street, Islington, u.t. 22 yrs., g.r. 24*l.*, r. 60*l.*, 310*l.*; 50, Lamb's Conduit-st., Russell-sq., u.t. 72 yrs., g.r. 15*l.*, r. 100*l.*, 1,460*l.*; Thurlow-pl., South Kensington, l.g.r. of 29*l.* 10*s.*, u.t. 31 yrs., g.r. 10*l.*, 310*l.*; 43 and 45, Darnley-rd., Hackney, u.t. 48 yrs., g.r. 15*l.*, 605*l.*; 10, Angel-ct., Strand, an improved rent of 43*l.*, u.t. 3½ yrs., 10*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs, for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS

TIMBER.

Greenheart, B.G.	ton	6 15 0 / 7 5 0
Teak, E.I.	load	10 0 0 / 13 0 0
Sequoia, U.S.	ft. cu.	2 3 / 3 0
Ash, Canada	load	2 10 0 / 4 5 0
Birch, do.		2 5 0 / 4 0 0
Elm, do.		3 10 0 / 4 15 0
Fir, Dantzic, &c.		2 10 0 / 3 15 0
Oak, do.		2 10 0 / 4 10 0
Canada		4 15 0 / 6 10 0
Pine, Canada red		2 10 0 / 3 10 0
Do., yellow		2 0 0 / 5 10 0
Lath, Dantzic	fath	5 0 0 / 6 0 0
St. Petersburg		5 0 0 / 7 0 0
Deals, Finland, 2nd 1st 2nd		7 10 0 / 10 0 0
Do., 4th & 5th		7 0 0 / 7 5 0
Do. Riga		6 0 0 / 8 0 0
St. Petersburg, 1st yellow		9 10 0 / 14 10 0
Do. 2nd yellow		7 10 0 / 9 0 0
Do. white		7 0 0 / 10 0 0
Swedish		7 0 0 / 15 10 0
White Sea		8 0 0 / 17 0 0
Canada, Pine 1st		13 0 0 / 24 0 0
Do. do. 2nd		9 0 0 / 16 0 0
Do. do. 3rd, &c.		7 0 0 / 10 0 0
Do. Spruce 1st		8 10 0 / 10 10 0
Do. 2nd and 3rd		6 10 0 / 8 0 0
New Brunswick		5 10 0 / 7 10 0
Battens, all kinds		4 10 0 / 13 10 0
Flooring Boards, sq., 1 in. prep.		0 10 0 / 0 14 0
1st		0 8 0 / 0 10 6
Do. 2nd		0 6 0 / 0 7 9
Other qualities		0 5 6 / 0 7 0
Cedar, Cuba	ft.	4 / 5
Boxwood, &c.		¼ / ¼
Mahogany, Cuba, 1st		4½ / 6½
Do., logs, cargo sz		4½ / 6½
Mexican do.	do.	4½ / 5½
Tobasco do.	do.	6½ / 7½
Honduras do.		5½ / 6½
Box, Turkey	ton	4 0 0 / 13 0 0
Rose, Rio		12 0 0 / 19 0 0
Bahia		10 0 0 / 18 0 0

TIMBER (*continued*).

Satin, St. Do.		
mingo	ft.	0 0/9 / 0 1/3
Porto Rico		0 0/10 / 0 1 6
Walnut, Italian		0 0/4 / 0 0/7
METALS.		
IRON—Bar, Welsh, in London	ton	6/5 0 / 6/15 0
Do. do. at works in Wales		5/15 0 / 6/5 0
Do. Staffordshire, in London		6/5 0 / 7/0 0
COPPER—British, cake and ingot		56 0 0 / 57 0 0
Best selected		59 0 0 / 60 0 0
Sheets, strong		69 0 0 / 0 0 0
Chili, bars		52 10 0 / 0 0 0
YELLOW METAL	ib.	0 0 6 / 0 0 6½
LEAD — Pig, Spanish	ton	12 10 0 / 0 0 0
English, com. brands		12 10 0 / 12 12 6
Sheet, English, 3 lbs. per sq. ft. and upwards		14 10 0 / 15 0 0
Pipe		15 0 0 / 0 0 0
ZINC — English sheet	ton	27 10 0 / 0 0 0
Vieille Montagne		28 5 0 / 0 0 0
TIN—Straits		90 10 0 / 0 0 0
Australian		90 15 0 / 0 0 0
English Ingots		94 10 0 / 0 0 0
OILS.		
Linseed	ton	21 17 6 / 22 0 0
Cocoanut, Cochin		32 0 0 / 0 0 0
Do. Ceylon		29 0 0 / 0 0 0
Palm, Lagos		25 10 0 / 26 0 0
Rape seed, English pale		28 15 0 / 0 0 0
Do. brown		27 0 0 / 27 5 0
Cottonseed, refined		18 15 0 / 0 0 0
Olive		22 0 0 / 24 0 0
Lubricating, U.S.		6 0 0 / 7 10 0
Do. refined		7 10 0 / 12 0 0
Lime—Stockholm	barrel	1 1 6 / 1 2 0
Archangel		0 14 6 / 0 0 0

TENDERS.

[Communications for insertion under this headin must reach us *not later than* 12 *noon on Thursdays.*]

ASHTON-UNDER-LYNE.—For the erection of a Free Library and Technical School. Messrs. John Eaton & Sons, architects, Stamford-street, Ashton-under-Lyne. Quantities by Mr. H. E. Metcalf:—

Allen Holmes, Ashton-under-Lyne (accepted)	£10,835 0 0

BARKING.—For the construction of a weir, &c., at the Barking Outfall Sewage Works, for the London County Council. Mr. A. R. Binnie, Engineer.

Mowlem & Co.	£4,037 0	Munday & Son	£1,890 4
G. Bell	2,714 0		

BOURNEMOUTH.—For supplying, erecting, and setting to work engines, pumps, boilers, &c., for the Sea-Water scheme of the Bournemouth Town Council. Mr. F. W. Lacey, Borough Surveyor.:—

A. B. Dawnay	£2,745 10 0
F. F. Reynolds & Co.	2 605 19 0
Goddard, Massey, and Warner, Nottingham*	2,515 7 0

* Accepted.

BRENTFORD.—For repairing and finishing thirteen cottages at Brentford:—

F. & H. Lawrie (accepted)	£303 0 0

BURSLEM.—For making, paving, &c., several streets (Grittonstreet, Derby street, Reid-street, &c.) for the Corporation. Mr. F. Bettany, Borough Engineer, St. John's-chambers, Burslem:

Derby street.

Smith & Taylor, Basford, Stoke-on-Trent (accepted)	£299 0 0

Paving Brick Hall, Ring, and Tunstall-street.

W. Grant, Burslem (accepted)	£112 0 0

CARLISLE.—For the work required in ten new houses, in Morley-street, for Mr. J. J. Fearnley. Mr. H. H. Rodgkinson, architect, 55, Bank-street, Carlisle:—

J. A. & J. Jackson (Builder)	£999 0 0
J. Hindson (Joiner)	453 0 0
J. Harrington (Plasterer)	133 0 0
J. Smith (Slater)	94 4 7
W. J. Wall (Plumber)	67 7 6
J. Allan (Painter)	29 18 6
J. Edmondson (Ironfounder)	17 0 0

[All of Carlisle].

CARLISLE.—For the erection of three cottages in Smith-street:—

James Hewitt, Carlisle (accepted)	£496 0 0

CHERTSEY.—Accepted for levelling, metalling, channelling, &c., several streets at Chertsey, Addlestone, Hersham, and Oatlands, for the Rural Sanitary Authority. Mr. W. Durrant, surveyor, Addlestone:—

Victoria-road—James Martin, Addlestone..... £159 0 0
Albert-road—William Bolton, Addlestone..... 133 10 0
Elston-road—James Martin, Addlestone..... 115 0 0
Highfield-road—G. A. Franks, Guildford..... 104 16 4
Masonic Hall-road—Wm. Hebburn, Worplesdon 94 9 0
Albany-road—William Hebburn, Worplesdon.... 242 10 0
Part of Vale-road—Wm. Hebburn, Worplesdon.. 86 5 0

FARNHAM.—For paving works (three contracts), for the Farnham Local Board. Mr. R. F. Hoskins, Surveyor, Farnham. Quantities by Mr. R. J. Hankins:—

Contract No. 1.

R. Chamberlain, Farnham	£504 12 0

Contract No. 2.

Victoria Stone Company, London	262 13 0

Contract No. 3.

R. Chamberlain, Farnham	42 10 0

[All accepted.]

FENTON (Staffs.).—For the erection of a chapel. Messrs. Whine & Perkin, architects, 14, New Bond-street, St. Ann's-square, Manchester:—

J. T. Clare	£1,69[illegible]	Frost & Son, Middlewich	£1,[illegible] 0 0
Mullan & Wilkes	1,662 0 0	Lidgey	1,42[illegible] 0 0
Edwin	1,648 0 0	C. Cornes, Hanley*	1,415 0 0
Leonard Price	1,588 5 0	H. Godwin	1,[illegible]9 0 0

Seating.

C. Cornes, Hanley*	£135 0 0

* Accepted.

GRAVESEND.—For the erection and completion of new Public Hall at Gravesend. Mr. J. Lee Johnson, architect:—

Higgs	£2,[illegible]0 0	J. O. Richardson	£2,600 0 0
J. W. Falkner	2,595 0 0	Balsam	2,575 0 0
Stimpson	2,580 0 0	Archer	2,[illegible]5 0 0
W. Tuffee	2,689 0 0	Hall (accepted)	2,490 0 0
Multon & Wallis	2,676 0 0		

HANLEY (Staffs.).—For the erection of school buildings at Glass-street for 700 children, for the School Board. Mr. Edward E. Swinnerton, architect, Howard-place, Hanley. Quantities by the architect:—

Robinson	£5,760	C. Cornes	£5,675
G. Ellis	5,480	Bradley & Co.	5,554
Osborne & Co.	5,450	T. Godwin, Hanley*	5,387
H. & R. Inskip	6,057	J. T. Clarke	5,442
N. Bennett	5,[illegible]		

* Accepted.

KINGTON (Herefordshire).—For sewering the town and constructing tanks, for the Kington Urban Sanitary Authority. Mr. E. L. Bamford, engineer, 4, Westminster-street, Hereford:—

Perrin & Long	£2,758 17 0	J. W. Evans	£1,491 7 4
C. Edwards	1,665 0 0	Geo. Law, Kidder.	
H. Welsh	1,544 0 0	minster (accepted)	1,311 12 0
H. Millward	1,443 2 6		

LEEDS.—For the erection of two houses, in Broadgate-lane, Horsforth. Mr. C. Fred. Wilkinson, architect, 35, Park square, Leeds:—

Mason and Bricklayer—Smith, Nayler, Horsforth ..£340 0 0
Carpenter and Joiner—J. Jowsand, Leeds 186 10 0
Slaters—J. Atkinson & Son, Leeds 23 15 0
Plasterer—J. Walsh, Armley 56 7 0
Plumber and Painter—Geo. Thompson, Leeds .. 69 10 0

732 2 0

LONDON.—For the erection of new premises at King's-cross, for Messrs. Thorley. Mr. Fred Pinches, architect, 5, John-street, Adelphi. Quantities by Mr. A. J. Turner, 1, Tudor-street, E.C.:—

McLachlan	£16,430	Holloway Bros.	£16,[illegible]30
Larter	16,425	Kilby & Gayford*	17,936
G. & S. Williams	16,[illegible]46		

* Accepted.

LONDON.—For pulling down and rebuilding the "Northampton Arms," Goswell-road, E.C., for Mr. J. D. Spiers. Mr. H. I. Newton, architect, 49, Victoria-street, W.:—

Mark	£7,993	Burman & Son	£7,400
Mattock Bros.	7,877	Lamble	7,252
Godden	7,851	Dearing & Son (accepted)	7,098
Patman & Fotheringham	7,[illegible]5		

LONDON.—For erecting new conveniences in Great Dover street, for the Newington Vestry:—

Frampton	£2,277 0	Finch	£1,853 0
Smeaton	2,050 0	Stidder	945 18
Burman	2,033 0		

LONDON.—For structural alterations to "The Lord Craven" Hotel, Westbourne Park. Mr. Jas. Warne, architect, Montpelier-road, Peckham:—

Josolyne & Young, High-street, Borough (accepted)	£360.

LONDON.—For constructing 18 in. pipe sewer, with manholes, flushing-tanks, &c., in Jockey's-fields, for the Holborn District Board of Works. Mr. L. H. Isaacs, Surveyor :—

J. Walker, Camden Town	£800	J. Mowlem & Co.	£715
Rudd & Son	800	C. W. Killingback & Co.	
W. Griffiths	784	Camden Town	675
J. Neave	760	* Accepted.	

LONDON.—For rebuilding Nos. 11 and 13, Homer-row, Marylebone, for Miss Crighill. Mr. Edmund J. Harrison, architect, 72, Chancery-lane, W.C. Quantities by architect :

F. Mark	£819	Lown & Sons	£785
W. Goodman	794	Ward & Lamble (accepted)	719

LONDON.—For new fifth story to Nos. 36 and 37, Newgate-street, for Messrs. Fannel, Phillips & Co. Mr. C. W. Chapman, architect, 19, Basinghall-street :

Taylor & Son	£887	Patrick & Son	£830
Bywaters	877	Jousiyne & Young (accepted)	785

MORDEN (Surrey).—For the erection of lodge for new cemetery at Hobald's Farm, for the Burial Board for the Parish of St. Mary, Battersea. Mr. William C. Poole, architect, 62, Belleville-road, Wandsworth common, S.W. :

Current & Son	£1,300	Batley	£1,125
Pics & Co.	1[illegible]7	Wallis	1,087
Jarvis	1,161	Horton*	1,084
Chesman & Son	1,149	* Accepted.	

[Architect's estimate, £1,050.]

ST. LEONARD-ON-SEA.—For residence, Fulsham Estate, for Mr. M. J. D. Stephens. Messrs. Elworthy & Son, St. Leonard-on-Sea, architects :

Boniface	£2,612	White	£2,135
C. & E. Harman	2,408	Eldridge & Catterson	2,090
Salter	2,350	Lay & Bird	2,058
Bevis	2,285	Shaw	2,024
Jenkins	2,260	Hughes (accepted)	2,016
H. Crittenden	2,118	T. Taylor	1,883

[Architect's estimate, £2,250.]

SHEFFIELD.—For the construction of a main brick sewer from Barnsley-road to Staniforth-road, for the Sewerage and Rivers Committee. Mr. G. Alfred Hurst, engineer, 108, Norfolk-street, Sheffield. Quantities supplied :

J. Rickerby	£1,950	Dearden & Jackson, Penistone-road, Sheffield (accepted)	£963 10
B. Powell & Son	1,503		
Scott & Ward	978		

SOUTHAMPTON.—For the erection of a villa residence, Northlands-road, Southampton, for Lieut.-Colonel Henry Paterson. Mr. William Burrough Hill, architect, Southampton :

T. J. Jukes (accepted)	£1,50		

SUDBOROUGH (Northamptonshire).—For the restoration of All Saints Church, Sudborough. Mr. J. C. Traylen, architect, Stamford. Quantities by architect :

Roberts Bros	£1,557	Holliday	£1,214 15
Thompson	1,344 0	Robert & Son Weedon*	1,228 16
		* Accepted.	

TOTNES.—For laying pipe sewers and other work for the Town Council. Mr. W. F. Tollit, Borough Surveyor, Bridgetown, Totnes :—

Sellwood	£227 10	Pike	£2 0 0
Fowden	221 0	Braddock	214 0
Ash	218 0	Vanstone, Paignton*	158 0
		* Accepted.	

TUNSTALL.—For malt house, engine and boiler sheds and chimney stack, at the Bradeley Wood Tileries, for Messrs. Timmis & Sons. Mr. Edwin Penn, architect, Stoke-upon-Trent :—

H. Goodwin, Longton (accepted)	£922 0 0		

WALSALL.—For pulling down buildings, erecting boundary walls, internal banking, &c., adjoining Bridge, for Brighton, for the Walsall Local Board. Mr. A. Southall, Surveyor, Public Offices, Egremont, Cheshire. Quantities supplied :

T. Cattarall & Co.	£400 0 0	Jno. Povall, New	
J. W. Wilson	384 0 0	Brighton (accepted)	£327 11 6
Kellin Bros.	381 4 4		

WEST HAM.—For alterations to boiler-house, &c., at Abbey Mills Sewage Pumping Station, for the London County Council. Mr. A. R. Binnie, Engineer :

Perry & Co.	£11,012 0 0	Munday & Son	£8,777 1 1
Mowlem & Co.	10,841 0 0	W. Gregar	6,744 0 0

WOOLWICH.—For additions to the Submarine Cable Depôt, Trinity-street, Woolwich, S.E., for H.M. Office of Works. Mr. R. H. Boyce, architect :

J. O. Richardson, Albert Works, Peckham, S.E.*	£2,749		
		* Accepted.	

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TO CORRESPONDENTS.

F. C. E (We cannot open our columns to what is in reality a theological discussion) M. L. S.—H. H.—C. G.—J. F. W. (amounts should have been stated) R. & Co. (ditto)—F. C. R. (received too late for this week : shall have consideration)

All statements of facts, lists of tenders, &c, must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Asphalte.—The Seyssel and Metallic La Asphalte Company (Mr. H. Glenn), Office, Poultry, E.C.—The best and cheapest materials damp courses, railway arches, warehouse floo flat roofs, stables, cow-sheds, and milk-roo granaries, tun-rooms, and terraces. Asphal Contractors to the Forth Bridge Co. [Ad

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PHOTOLITHOGRAPHERS,
22, Martin's-lane,
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The Builder.

VOL. LX. No. 2507. SATURDAY, FEB 21 1891.

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Cross Section Showing Detail ..... *Double-Page Ink-Photo*
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*A New Dictionary of London.**

THE latter part of last year was signalised to an unusual degree by the publication of topographical books dealing with London. These were marked by varying merit, and most of them were plentifully illustrated. With one or two exceptions, the several texts had plainly enough been "written up" to the pictures, which is seldom a satisfactory method so far as the earnest reader is concerned; and upon that account the books did not constitute, upon the whole, a considerable contribution to an advanced knowledge of their subject. The Rev. W. J. Loftie's book,—"London As It Is," with illustrations by Mr. Wm. Luker, jun.,—is, we understand, rapidly drawing near to its completion. Meanwhile we can make ourselves quite content with the well-ordered stock of information contained in the three portly volumes which have just been brought out by Mr. Wheatley. There are, we should imagine, very few amongst our readers who need to be reminded that Mr. Henry B. Wheatley brings to his task qualifications and credentials of no ordinary kind. The author of "Round About Piccadilly," of "Samuel Pepys, and the World He Lived In," and of the article upon "London" in the "Encyclopædia Britannica," the life-director of the Topographical Society of London, and a past editor of the *Antiquary*—to say nothing of his proved attainments in other fields of literature and art—might, *à priori*, be deemed capable of successfully accomplishing so large an undertaking. This was, in effect, to carry down to our own present day the late Peter Cunningham's "Handbook of London," one of Murray's well-known series. But it is a handbook no more. A compilation in three volumes, of large demy-octavo size, containing in all 1,774 pages, and weighing nearly 10 lbs., forms, at first sight, a portentous outgrowth from the convenient book, familiar by its size and colour, and having but 602 pages, which, published in 1850, formed the second and enlarged edition of Cunningham's handbook. The latter writer adopted a plan which we believe was first used by Elmes—that of arranging the names of buildings, streets, places, &c., in alphabetical order. This rendered his book very useful for purposes of easy reference within doors; and equally serviceable for outdoor use to those who are not quite strangers in the town. We ourselves have on more occasions than one met parties of visitors, with their Murray in hand, yet rather at a loss to know exactly "where they were." In this respect we have found the small yellow volume, issued yearly in the late Mr. Herbert Fry's name, to be well adapted for the ordinary wants of visitors, by reason of its directions as to the situations of the places which mostly are sought after, and its sets of maps *à vol d'oiseau*. Mr. Augustus J. S. Hare's "Walks in London," which has attained to the honour of several editions, is a pleasant companionable book, beyond question. But it is so untrustworthy, and so full of inaccuracies, which the careful observer will at once detect, that we should hesitate to recommend it, when many a better hand-book can be found.

No one man in a single lifetime could hope to write *de novo* the History of London. We have seen it attempted lately by Mr. Loftie, whose two volumes were published under that title, in 1883. His lively style, the fresh maps and plans, his frequent choice of a new standpoint whence to enter upon an old topic, all these attractive qualities earned for his "History" a well-deserved popularity. Nevertheless, a more sober judgment compels us to the opinion that that author's plan, well-conceived as it undoubtedly was, failed in the execution. He is also author of the volume "*London*," being the first of the series of Historic Towns," edited by Professor Freeman and the Rev. W. Hunt, which was reviewed in our columns on January 7, 1887. His ambitious project still remains unperformed. In resuming the task of Cunningham's hand-book, and in extensively enlarging upon its scope and original contents, Mr Wheatley stands self-confessed as a rich harvester on the same ground wherein many others have assiduously toiled before him. The magnitude of the debt does in no way detract from the individual merits of the debtor. The precedent labours of Stow, Hatton, Noorthouck, Strype, Maitland, Pennant, Malcolm, Newcourt, Allen, together with a score of their fellows, are, by the very nature of the case, absolutely necessary to a compilation that is cast into the present shape. Nor should we neglect, when recalling the valuable work of past writers, those who severally concentrated their efforts upon closely defined localities, or upon particularly chosen themes. It is in no spirit of disparagement of more recent endeavours that we premise that any student can ill afford to leave unopened many volumes (all of them probably not always ready to his hand) if he is careful to gather authentic materials, yet whose load, in the end, will perhaps prove overwhelming. At this moment we call to mind such books as those of Neale and Dean Stanley (Westminster), Faulkner (Hammersmith, Chelsea, Fulham, &c.), Palmer (St. Pancras), Cox (St Helen's, Bishopsgate), Park (Hampstead), Robinson (Hackney), Ellis (Shoreditch), Allen (Lambeth), Dugdale and Dean Milman (St. Paul's), W. Herbert (City Companies and Inns of Court and Chancery), Rowland Dobie (Bloomsbury and St. Giles), Lewis, Tomlins, and Nelson (Islington), Wilkinson, J. T. Smith (Antiquities of Westminster, &c.); or of W. Howitt (Northern Heights), Elmes (Wren's Life and Times), Britton and Pugin, George Godwin (The City Churches), Leigh Hunt (Kensington, &c.), and T. C. Croker (A Walk from London to Fulham). The list is well-nigh endless; yet these are amongst the authors whose works stand out eminent, and who add generously to the common fund.

Within the last fifty years or so our knowof London antiquities—very different from antiquarian enthusiasm—has made substantial progress. Our own generation enjoys the great advantage of having lived to profit by the learning and research of several distinguished men. No one will deny to Mr. W. Rendle the title of "the historian of Southwark." We are enriched by the investigations of General Pitt-Rivers, Mr. C. Roach Smith, and Mr. J. E. Price in the matter of Roman remains; of Mr. W. Ralph Douthwaite amongst the Gray's Inn archives; of Mr. Maxwell Lyte amongst

* "London Past and Present: Its History, Associations, and Traditions." By Henry B. Wheatley, F.S.A., Based upon the handbook of London by the late Peter Cunningham. London: John Murray. 1893.

the manuscripts in the cathedral church of St. Paul. We have gained, moreover, Mr. Riley's "Memorials of London and London Life," whilst Dr. Reginald R. Sharpe follows with his lordly volumes (1889-90) by way of a calendar of wills proved and enrolled in the Court of Husting, London, 1258-1688. In September, 1889, the Court of Common Council voted a maximum sum of 1,000*l.* to be expended in the production of a new history of the city of London, derived, as far as may be, from the civic archives.

Mr. Peter Cunningham died on May 18, 1869. His brother, Colonel Francis Cunningham, undertook to prepare another edition of the handbook, but made little real progress therewith, and, after his death, the correction and completion of the book devolved upon Mr. Thorne. Mr. Thorne died before things were ready for the press, and his MS. was entrusted to Mr. Wheatley for revision previous to its publication. The result from this delay is a set of volumes which we may fairly describe as an historical dictionary of London. Discarding most of the perfunctory portions of Cunningham's own introduction, he gives to us instead a condensed history of the foundation and growth of the city. Those who approach the subject for the first time will perhaps be disappointed to find that even now so little can be said with any certainty about its pristine origin. We must, of course, repudiate the inventions about Brute and his new Troy set up in Geoffrey of Monmouth's romance. "Myth," writes the late J. R. Green, "legend, tradition, the classical pedantry of the day, the Welsh dreams of future triumph over the Saxon, the memories of the Crusades and of the world-wide dominion of Charles the Great, were mingled together by this daring fabulist in a work whose popularity became at once immense."* Albeit, it inspired one of Spenser's sounding couplets:—

> "For noble Britons sprong from Trojans bold,
> And Troy-novant was built of old Troyes ashes cold."

and has furnished to a living Laureate some themes for the lofty lessons of courtesy and true nobility that run through his "Idylls of the King." After quoting the *Liber Albus*, and its referring of all good things in London to ancient Great Troy, Mr. Wheatley says:—

> "Now scepticism has gone to the opposite extreme, and denies the very existence of a British London. The name, however, seems to show that there must have been some early settlement here, for whatever the etymology may really be, no one disputes that it is of Celtic origin. . . . We need not dispute the existence of a British settlement before the Roman Conquest."

The commonly-received, and quite possible, etymology lies in the British *Llyn-Din*, or Lake-Fort, the stronghold, on the rising ground eastwards of the wall-brook, may be, that Julius Cæsar wrested from Caswallon, the scene one hundred years later of Boadicea's victory, and of her quickly following overthrow by the legions of Suetonius. Our earliest conquerors made good their stand amongst us by the building, before the end of the fourth century, of an encompassing wall, the first London wall, which, as Mr. Loftie aptly reminds us, was thrown up after the conversion of the West, and therefore around a Christian city. But after an interval of 365 years the Romans had to hasten away from our shores to encounter troubles that threatened them nearer to home, and for a space of two centuries "there is perfect darkness as to the state of London [save for the flight thither of the men of Kent from Crayford before Hengist and Horsa in 457] and we are left entirely to conjecture as to its history." In the end Ælfred succeeded in vanquishing the Danes; he re-built the wall and makes his son-in-law, Æthelred, its lord. The Saxons, in their turn, are forced to yield to the Norman host, whose leader signalised his conquest by the planting of his dominant *Arx Palatina* in the East, and by the re-building of Æthelberht's old St. Paul's. By the palace near to the western Minster his son builds a noble hall (so wantonly defaced in our own day), and there in Henry VII.'s reign the Law Courts of England were fixed. Thenceforward we may justly regard Westminster, declared "a city" *temp.* Henry VIII., as being the actual capital of the kingdom, Canterbury being its metropolis—the place where the sovereign is crowned, lives, and deals out justice; a continuity still unbroken, for the new Courts of Justice, excepting portions of the eastern wing, and our royal palaces lie within the bounds of the western city. So the chronicle runs on, more steady and better known; whilst depressing epochs of revolt and civil war, of fire or pestilence, of confiscation and persecution pass over its face. But London emerges through all supreme, and we may trustingly look forward to a better rule of economic municipal control. Mr. Wheatley concludes his introduction—

> "The Londoner will, as an archæologist, regret the many interesting relics of the past which have been swept away; but, as a patriot, he will rejoice at what has already been done for the improvement of the sanitary condition and the architectural appearance of the greatest city in the world."

And, in sooth, great, mighty, and terrible, as De Quincey called it, it had already been, in outward form at least, one of the most beautiful of cities. Its rivers once flowed clear, its stones were once clean, its grass was green. We can figure to ourselves the countless rivulets and streams, their banks dotted here and there with mills, whose clacking sounded so delightfully to the ear. The spring-heads and wells whereunto the citizens and apprentices would resort when bank-holidays were not—all such charms within short distance from its walls, are indicated by Fitzstephen in his preface to his life of his master, St. Thomas of Canterbury, *temp.* Henry II. It has been estimated that at one time nearly one-third of the entire site was covered with churches and monastic buildings with their precincts. From their midst rise aloft the towers and spires of St. Laurence Pountney, St. Mary, Summers-hythe (Somerset), St. Michael, Cornhill, St. Mary (Elaynge), Spital, St. Dunstan-in-the-East, St. Dionis, St. Mary-le-Bow, and St. Paul. Around them the large conventual churches of St. Katharine-by-the-Tower, All Hallows, Barking; St. Clare (Minories), Crutched Friars; the Augustinian Friars, Grey Friars (Newgate-street), Black Friars, White Friars, and St. Bartholomew-the-Great, with the Priories of St. Helens (Bishopsgate), Holy Trinity (Aldgate), and St. John and St. James (Clerkenwell). On the Bridge is St. Thomas's Chapel, and by the Surrey side we see St. Olave and St. Mary Overy.*

As touching the relics, Mr. Wheatley's list of those preserved in the Guildhall Museum is very meagre. Amongst the more recent additions the following are worthy of being noticed. The carved lion from Holywell-street, Strand (to which we referred in a "Note" on October 26, 1888); a child's coffin cut out from the solid chalk, found laid over a Roman cinerary urn, 12 ft. below ground, at the west end of St. Olave's, Old Jewry; the two hour-glasses and figure of Time (all carved in wood) from St. Giles's, Cripplegate (1888); a whale vertebra dug up in the Minories (1885); a carved female head, Paternoster-row, with date "1677"; another carved head, grotesque, from Spital-square (1890); the so-called "pill" sign from the old "Maidenhead" behind Bow Church (see the *Builder*, Dec. 28, 1889, and Jan. 4, 1890); the two figures, by Cibber, that rested over the gates of Bethlehem Hospital, Moorfields; the sign of the Bell from Knightrider-street; the "Bull and Mouth" sign, Angel-street, and the trophy to Milo the Crotonian, Queen's Hotel, St. Martin's-le-Grand; a fossil vertebra and some stone cannon-balls from the Tower Bridge works; with a pair of huge fossil tusks from Wapping.

All lovers, English and American alike, of Elia, will be glad to learn that Mr. Wheatley is not quite accurate in saying that Crown Office-row, Inner Temple, has been rebuilt. We are authoritatively informed that Nos. 4, 5, and 6, to the west, were pulled down in 1859, and re-erected by 1865, but Nos. 1, 2 (Charles Lamb's birthplace), and 3, are still standing. The row was built in 1737—which date is inscribed on the east wall of No. 1—by name of the "New-building opposite the garden-wall." The garden-wall is now replaced with a railing, and the gates, bearing date "1730," were, about twenty-five years ago, removed a few yards westwards to their present position immediately opposite to No. 2 staircase. We may add that the "Samuel Salt" of Lamb's essay, "The Old Benchers of the Inner Temple," is not a mythical personage. Mr. J. H. Milton, of the Treasurer's office, enables us to quote this record:—"13th May, 1768. At this Parliament: It is ordered that Samuel Salt, Esquire, a Barrister of this Society, aged about Fifty, be and is hereby admitted for his own life, to the benefit of an Assignment in and to All that Ground Chamber, No. 2, opposite the Garden Wall in Crown Office Row. He the said Samuel Salt having paid for the Purchase thereof into the Treasury of this Society, the sum of One Hundred and Fifty Pounds." Dr. Johnson-buildings, S. Smirke, R.A., architect, has replaced the chambers, in Nos. 1 and 4 of which respectively Dr. Johnson and Lamb lived. We are also informed that the staircase, with the doorway and its hood, were presented by the Benchers to the Crystal Palace Company in November, 1857.*

The account of Lamb's "cottage in Colebrooke-row, Islington," whither he and Mary removed in the summer of 1823 from 20, Russell-street, Covent-garden, needs to be re-written. Once more "Colebrooke Cottage,"—the name "Elia" was struck out more than twelve months ago,—it stands, four stories high, at the northern end of Camden-terrace. It is no longer detached, for the three adjoining houses were built nine years since. The garden is converted into Webb's stable and van-yard. A woodcut in the *Illustrated London News* of January 6, 1849, shows the house as in Lamb's time, with the stone steps turning to the left (they are now turned to the right), from which Dyer walked into the New River, and which Lamb himself must at times have found to be rather awkward for ascent. The palings, drawn in the wood-cut, are said to have been put there by Lamb; but the tree by the riverside has gone. The two windows of the dining-room (front) are made into one, and the three windows of the "lightsome drawing-room" (Lamb to Bernard Barton, September 2, 1823) into two. "Colebrooke-Row, 1768," is inscribed on a tablet in the wall of No. 32, on the opposite side of the way. The cottage is visited constantly by Americans. So again, it should have been stated that No. 7, Little Queen-street, where Mary Lamb, in a fit of insanity, killed her mother, has, together with Nos. 6 and 8, long been covered by Holy Trinity Church. No. 7 stood over against Gate-street. No reference is made, under St. Botolph's, Aldgate, to De Foe's marriage. In the *Athenæum* of August 23, 1890, we read that the licence allegation lies in the Vicar-General's Office—"28 December, 1683, Charles Lodwick, of St. Michael, Cornhill, applies for Daniel Foe of the same parish, 24, and a batchelor, marchant [an earlier date than that given by Mr. Wheatley for De Foe's hosiery shop in Freeman's-yard, Cornhill], and Mary Tuffley, of St. Botolph, Aldgate, 20, spinster, with consent of her father. At St. Botolph Aldgate, St. Giles Cripplegate, or St. Laurence Jewry." The St. Botolph register has this entry: "Jan. 1 1683 [O.S.] Daniel Ffoe, batchellor, and Mary Tufflie, spinster, married by Mr. Hollingworthy." If the age of De Foe given in the allegation is correct, it goes far to determine the vexed question of the year of his birth. Strange to say, Mr. Wheatley does not give the name of Peter Cunningham himself in

* "A Short History of the English People," 1876, fo. 115.

* Compare with Mr. H. W. Brewer's view (*temp.* Henry VIII.) in the *Builder* of January 7, 1888.

* See the cut in the *Builder*, September 12, 1857.

the list of distinguished *alumni* of Christ's Hospital. We are authoritatively told that Peter, son of Allan Cunningham, citizen and patten-maker, was a "blue" during the interval 1825-31. Nor that of Louis Cavagnari, the hero of Cabul, whose bust was unveiled in the court-room nine years ago. Similarly, under Westminster school, the names of Cockerell and Gwilt, architects, are absent, with those of Jeremy Bentham, Dr. Mead, Sir F. Burdett, Sir Elijah Impey, Topplady, Samuel and Charles Wesley, Admiral Rous, Bonnell Thornton, Lord Peterborough, Robert Harley, Earl of Oxford; Lord-Chancellor Jeffreys, Browne Willis (antiquarian), Field-Marshall Lord Lucan, Henry Fynes Clinton, William Francklin (Orientalist), and E. Gunter (mathematician), died 1626. Vincent-square has been the playground for years past. We don't quite see why. Ashburnham House, in Little Dean's-yard, in the garden of which is part of the refectory wall, is spoken of as being "now a prebendal house." It passed to the school in 1881, in fee simple, in pursuance of the Public Schools Act, 31 & 32 Vict., cap. 118, and has been used for class-rooms ever since. Mr. Turle's house was next adjoining, over the "dark cloisters," and was pulled down in 1883. For these two houses—the changes evoked a considerable controversy at the time—a sum of 6,000*l.* was paid by the governing body to the Ecclesiastical Commissioners, with another sum of 4,000*l.* for No. 18, in Great Dean's-yard. From out of these moneys were built the two new canon's residences in the old Infirmary Garden.

Inasmuch as a Royal Commission is inquiring into the interment or commemoration of illustrious men in Westminster Abbey, we may state that Mr. Wheatley does not bring his book up to date in these respects. We fail to find that he records the burial of Lady Augusta Stanley (1876), Dean Stanley (1881), and Charles Darwin (1882); of Robert Browning (on December 31, 1889, by Chaucer's tomb), G. E. Street (1881), and Wm. Spottiswoode, P.R.S. (1883). Moreover, busts will be found in the Abbey in memory of Coleridge, by H. Thornycroft (7 May, 1885); Archbishop Tait, by Armstead (November 13, 1884); Burns, by Sir John Steell (March 7, 1885); Longfellow, by Mr. Brock (1884); Sir G. C. Lewis (1864); Macaulay (1865); Earl Russell (1880); Cobden (1866); Rev. F. D. Maurice (1872); Lord Lansdowne (1873); Sir Jas. Simpson (1875); Sir Chas. Lyell (1877) and Bishop Thirlwall (1877); George Grote (1872); Charles Kingsley (1875); and medallions in memory of Professor Fawcett, the beautiful work of Mr. A. Gilbert, and erected by the nation (1886), Darwin (1887), W. E. Forster (1888), Sir Henry S. Maine (1889), Balfe (1882), and John Wesley (1876). To one or two of these would apply the saying of Dr. Gregory, repeated by Dr. Johnson, that he had "seen erected in the church a statue of that man [Milton's bust, 1737] whose name I once knew considered [by Dr. Sprat, dean] as a pollution of its walls." Dean Stanley's monument and effigy (1884) are the joint work of Mr. J. L. Pearson and the late Sir Edgar Boehm, R.A. There are statues, too, of Lord Shaftesbury, the philanthropist, by Boehm (1888); Lord Beaconsfield, by Boehm (April 19, 1884); and Lord Stratford de Redcliffe (1884). Lord John Thynne's monument (1885) is in the choir, north aisle. He was the last resident in Ashburnham House. A medallion to James Turle, organist, was set up in the west cloister in 1884. The memorial window to Chaucer is cited, but not those to Robert Stephenson (1862), Joseph Locke (1863), I. K. Brunel (1865), Sir C. W. Siemens (1884), and Richard Trevethick (1888), engineers; to the poets Herbert and Cowper, as old Westminster boys, by Mr. Childs, of Philadelphia (1876); V. Novello (1863), and Jas. Turle (1882), musicians. To the John Conduitt monument has been added a memorial of Jeremiah Horrocks, who, when only twenty years of age, computed and observed with greater accuracy than by any others the transit of Venus which occurred on December 4, 1639. That marvel amongst astronomers died two years afterwards. We notice that Mr. Wheatley repeats Cunningham's transcript of the words on Edward I's. tomb; even Stanley does not give them correctly; by writing "Scotorvm" instead of "Scottorvm;" and in the Nightingale monument it is the left, and not the right, arm and hand of Lady Elizabeth (not Mrs.) Nightingale which "are considered by sculptors as the perfection of fine workmanship." She was a daughter and co-heir of Washington, Second Earl Ferrers, and sister of Selina, Countess of Huntingdon. She died in 1731, and the monument, erected in 1758, is really to her husband, J. Gascoigne-Nightingale, who died in 1752, at Enfield.

Apropos of the statement that Henry Cary, translator of Dante, was laid in an unmarked grave, we may refer Mr. Wheatley to a letter printed in our colums on February 8, 1890, containing a copy of the inscription made by our correspondent. To the three or four sixteenth-century booksellers whose names are given under "St. Paul's-churchyard," we will add those of the celebrated printer, John Day, who removed hither, *circa* 1575, from "over Aldersgate beneath St. Martyn's," *circa* 1575; John Reyner, printer and bookbinder, at sign of the St. George, 1527-1544, whose portrait and memorial-window were in old Stationers' Hall, and who was succeeded here by Cawoode, his apprentice; and Henry Penwell, at the Trinity, 1518-1539, printer and bookseller, to whom Wynkyn de Worde bequeathed 4*l.*, value of printed books. We believe we are correct in saying that Mr. A. Waterhouse, R.A., and not (as stated) Mr. Barnes Williams, was architect of the new St. Paul's School, opened on July 23, 1884, by Lord Selbourne.

Referring to the scheme for decorating the dome of St. Paul's with mosaic, we read that "little has since been done" by a subcommittee appointed *ad hoc* in or soon after 1877. But, as it happens, we know that a good deal has been done. Mr. W. E. F. Britten has sent to Signor Salviati's (Venice) two full-sized working cartoons of SS. Mark and Luke for the pendentives over the entrance into the choir, which will be executed in mosaic. Of the four greater prophets, from cartoons by Mr. Rubens Townrowe, after the late Alfred Stevens's designs, Isaiah was placed more than ten years ago, and Daniel will be set up within a month; St. John, by Mr. G. F. Watts, R.A., was fixed about a year since; and, with that painter's concurrence, Mr. Britten will make some improvements in the drapery and colour of the St. Matthew.

There is an odd mistake of omission or commission, or both, in regard to the model of the first Greek cross design for St. Paul's, which is referred to as "now in the South Kensington Museum." There may be some model of the design there which we do not recollect; but the model *par excellence* is, and has been for years, in a room in the cathedral, though not accessible to the general public. The choir apse is in course of decoration by Messrs. Bodley & Garner, architects; but this is not a happy subject. Here, too, we notice some omissions from the record of more recent burials, including those of Sir Edwin Landseer (1873), J. H. Foley (1874), Sir Henry Bartle Frere (1884), George Cruikshank (1878), Lord Napier of Magdala, with the highest military honours, on January 21, 1890. On May 18, 1888, the remains of Maurice Greene (musician) were removed hither from St. Olave's, Old Jewry. He had been organist at St. Paul's from 1718 to his death in 1755. Suett, the actor, who had been of the choir as a boy, was buried in the churchyard. Under "Whitehall" is a reference to "the lead [*sic*] statue of James II. behind Whitehall." We do not know of any authority for saying that this figure, the most beautiful of its kind in the town, is of lead, nor does an examination we have made of the metal corroborate the statement. Moreover, in Sir John Bramston's Autobiography, first printed by the Camden Society in 1845, is "On New Year's Day, 1686, a statue in brass was to be seen (placed the day before) in the yard at Whitehall, made by Gibbons, at the charge of Toby Rustick [Rustat], of the present king, James the 2nd." Mr. Wheatley repeats Cunningham's mis-statement that Trinity Church, Minories, is the church of the Priory of Holy Trinity, founded by Queen Matilda in 1108. That priory, one of the richest in England, was by Aldgate. Its church remained to Stow's day,—he says "it seemeth to be very old,"—and, having served for the united parishes of St. Mary Magdalene, St. Michael, St. Katharine, and the Trinity, is represented by St. Katharine Cree (or Christ) church, which is on the priory burial-ground. Now, under "Minories," Mr. Wheatley quotes Stow, and apparently with approval, as did Cunningham:—

> "An abbey of nuns of the order of St. Clare, called the Minories, founded by Edmond, Earl of Lancaster . . . . in the year 1293. . . . . In place of this house of nuns is now built divers fair and large storehouses for armour and habiliments of war, with divers workhouses serving to the same purpose: there is a small parish church for inhabitants of the close called St. Trinitie's [Trinity Church in the Minories]."

Clearly, Stow knew the two churches, whose positions are indicated in Mr. H. W. Brewer's view, which we published January 7, 1888.

The tower, at any rate, of St. Mary Somerset, Upper Thames-street, has *not* shared the fate of the church. There it yet remains; having stood at the church's south-western corner. It is in five stages; with a square panelled pedestal, and urn, at each angle, and in the centre of each side a similar pedestal, carrying an obelisk, also panelled, and with a ball on top. The obelisks rise to a greater height than the urns. The great quadrangle of St. Bartholomew's Hospital, begun by James Gibbs, is said to have been the first instance of the use of Bath stone—it was recased in 1851 by Hardwick. The house in Kensington, wherein Thackeray wrote "Vanity Fair" is in Young, not "York"-street. We find no reference in the index to Mozart, or in the text to Cecil-court, St. Martin's-lane (recently demolished), where he and his sister lodged with their father on coming to England in April, 1764; or to No. 45, High Holborn, where Haydn had his first lodgings in London — pulled down about nine years since for the First Avenue Hotel. Nor does the author seem to be aware that the great interest attaching to the old Opera House in the Haymarket is that it was the house in which Handel's operas were produced during the great period of his operatic success, when the house was so crowded that ladies and gentlemen were requested to come without their hoops and swords respectively. There is a watercolour drawing of the house in the Crace collection. To the account of Lord Cochrane's escape from the King's Bench Prison, whither he "was committed for complicity in certain Stock Exchange frauds"—the De Berenger frauds—a note might be added that eighteen years later the gallant commander's innocence was established, and his honours of knighthood restored. See G. Lathom Browne's "Narratives of State Trials" (1882). Whitcomb-street is correctly described as [extending from] "Pall Mall East to Coventry-street, originally *Hedge-lane*." But on another page we read: "Hedge-lane, now Dorset-street . . . . leading from Pall-Mall East to Coventry-street." The fact is Dorset-*place* was incorporated with Whitcomb-street a few years ago. Prince's-street, now merged into Wardour-street, was formerly part of Hedge-lane. At the corner of Prince's (now Wardour) and Richmond-streets, south-west end of the latter, was a house,—pulled down in June, 1885.—which was believed to have been inhabited by Nell Gwynne. Under "King's-square-court, Dean-street, Soho," is cited Sir Isaac Newton's acknowledgment, March, 1693, of the receipt of a "box of rulers" from Mr. Fatio, in King's-square-court, near Soho-square, with the remark, "This is worthy of note as preserving

for a century the old name of Soho-square." The square was built in 1681, and the citation points rather to an early adoption for it of the name "Soho" alone. In Shadwell's play of "The Scourers" (1691) the name Soho-square occurs thrice; but the square was also known as King's-square for about sixty years later. In the index to the Parish Clerks' "New Remarks of London" (1732) is: "King's-square, *vulg. called* Soho-square, near Compton-str." In No. 2 of "The Spectator," March 2, 1710-11, Steele makes Sir Roger lodge in Soho-square. According to the rate-books of St. Anne's, Soho, we find that a Lady Coverley was living there in 1707. The then inhabitants were rated thus: — Monmouth House (vacant), Lady Cavendish, 2*l.*; Earl Berkeley (Charles, second earl), 2*l.*; Earl Carlisle (Charles, third earl), 5*l.*; Lady Ffauconbridg, 4*l.* 3s.; Sir Orlando Bridgman, 1*l.*; Sir Richard Onslow, 1*l.*; Countess Leicester, 1*l.* 13s. 6d.; Lady Coverley, 8s.; Lord Geo. Howard, 1*l.* 5s.; Sir John Newton (head of Sir Isaac Newton's family), 1*l.* 13s. (again in 1716); and Sir Cloudesley Shovell, 4*l.* The Soho quarter, so greatly changed by the making of Shaftesbury-avenue and Charing Cross-road, was singularly rich in street tablets: some that may be worthy of record—"Crowne-street, 1775,"—on wall (in 1885) of No. 85, at south-east end, junction with Moor-street; "Crowne-court in Poltney-street, 1707," at north-east corner of east side of the court, pulled down: "Nassau-street in Whethin's Buildings, 1734," No. 12, at south-west corner, junction with Gerrard-street, "Edward-street, 1686," and "Wardour-street, 1686," at junction of those two streets. Wishart & Lloyd's tobacco and snuff shop was at 21, Coventry-street, when that side of the street was pulled down for widening the thoroughfare, *circa* 1881, and not, they tell us, in the Haymarket. The corner shop was Last's, a trunk manufacturer's. Wishart's, it may be added, was a favourite resort of Jacobites in the earlier half of the eighteenth century. Their figure of the Highlander, one of but two or three in London, was destroyed on the removal to the Haymarket—west side. Hard by is Fribourg & Treyer's fine old shop-front, with which should be compared the shop-front in Brewer-street, corner of Lower James-street.

The contents of such a work as this cannot be mastered in a day. In glancing through its pages we see, it is true, omissions and mistakes, and do not find the topographical particulars as full as we expected. Some changes in the names of streets, &c., are unrecorded, as well as the repair or re-building of certain churches. Yet these, and the like to them, are small blemishes, many to be best corrected by observation upon the spot. Though we miss the easy flow of a continuous history we think that, despite the rather rigid and unsympathetic treatment involved, the author is wise in adhering to the former arrangement. It is, indeed, a noble performance, and the gratitude of all is amply due to Mr. Wheatley for writing so great a book upon so great a theme.

NOTES.

WERE it not for the combination which exists between the various labour unions, the difficulty at the Cardiff docks would have been at an end,—most of the strikers' places being now filled. But it would appear that it is not to be settled on its merits, the affiliated unions being expected to come out in order to force the employers to re-instate the self-discharged men,—which, as the places were kept open for a long while, the employers decline to do. Sir W. Lewis (Lord Bute's agent) in the course of an interview with Mr. Mann, declared that there was nothing left to negotiate about, but the strikers subsequently expressed a determination to "fight to the last," —though, if there is nothing to negotiate about, there cannot be much to fight for. It appears to be essential for the restoration of peace that all coercion and boycotting (or whatever is to be the name of a system imposing restraints upon freedom of contract), shall be *really* abandoned by both sides. As the men claim that the shipowners should exercise strict neutrality in the selection of crews, they must abandon the absurdly illogical practice of throwing up their employment whenever it brings them side by side with men who have not joined their union. This is so far recognised by their leaders that a notice was issued on Tuesday night withdrawing a manifesto dated Dec. 5, the carrying out of which was bound to cause friction and difficulty. This manifesto called upon the men to "refuse to do any work upon the boats of Messrs. Shaw, Savill, & Co. (and others named) until they agreed to sign their crews at the shipping offices, and to employ members of the Seamen and Firemen's Union only;" and yet employers are expected to exercise strict neutrality! On the other hand, it is alleged that while the shipowners express a willingness to leave the selection of crews to the captains, one of the regulations of the Shipping federation provides for giving a preference to federation men. After the preposterous treatment the latter have experienced at the hands of the Union men this can hardly be considered unreasonable; but still, as long as the clause remains on the back of the Federation "tickets," so long the ostensible impartiality of the shipowners will be regarded with suspicion.

THE debate on the Factory and Workshops Act Amendment Bill on Wednesday afforded a curious illustration of the occasional differences between the views of philanthropists and operatives in regard to schemes for the benefit of the latter. It appears that in the woollen and worsted manufactories the rooms for fine spinning have to be kept at a temperature of 70 deg., or the work breaks and is otherwise difficult to execute. The Bill proposes that 600 cubic feet of air per head per hour should be introduced as a compulsory minimum, -not over liberal, one would say; but it appears that the operative, so far from thanking his benefactors for this, will only be likely to complain that the temperature of the room is reduced and his work spoiled or rendered more difficult of execution. It does not seem to have occurred to any one who took part in the debate that warmed air could be introduced. This would mean extra cost in the building, no doubt, and as foreign competition already cuts down profits to the smallest margin, this would perhaps be regarded by the mill-owner as financially out of the question; and if it is so, no good would be done to either employer or operatives by pressing unremunerative conditions on the former. Still, that is the way it can be done, mechanically, and it was rather surprising to see no reference whatever to this in a debate in which a good many who might be called practical men took part.

THE evidence of Dr. Thorne Thorne before the Committee of the House of Lords, in regard to the outbreak of diphtheria in St. Bartholomew's Hospital, is to be noted as entirely at variance with the idea which recent experience seems to point to, that diphtheria is nearly always connected with insanitary building. Dr. Thorne denies that the diphtheria at the Hospital arose from any defect in the drainage, and observes that diphtheria is increasing very much at present, and that its increase is coincident with a great general improvement in the sanitary condition of buildings, so that the two classes of facts cannot be connected. This is not only contrary to general belief but to a great deal of detailed evidence in many cases. At all events the surveyor to the Hospital, Mr. I'Anson, admitted that the drainage system was not up to date, that some of the drains ran under the buildings, and that the main drain going into Little Britain was not ventilated. If Dr. Thorne Thorne is right in thinking that diphtheria is not connected with bad drainage, the fortuitous concurrence of the two phenomena in so many cases is rather difficult to understand.

THE House of Commons acted wisely in accepting Mr. Plunket's amendment, last week, on Mr. Sydney Buxton's resolution in regard to Government contracts. The idea of binding a contractor in a Government contract, "under penalty," to observe "the recognised customs and conditions as to rates of wages and working hours which prevail in each particular trade," is absurd on the face of it; it is compelling a man, under legal penalty, to conditions which cannot be legally defined. Mr. Plunket's amendment ran:—

"That in the opinion of this House it is the duty of the Government in all Government contracts to make provision against the evils which have recently been disclosed before the House of Lords' Sweating Committee, and to insert such conditions as may prevent the abuses arising from sub-letting, and make every effort to secure the payment of the rate of wages generally accepted as current for a competent workman in his trade." (Cheers.)

That recognises and recommends a principle, without binding men down to specific undertakings of an indefinable nature.

WE have received some particulars as to the programme and regulations of the International Fine Arts Exhibition to be held in Berlin this summer. We have not space to print them in full, but we extract such points as are likely to be of interest to any of our readers who think of exhibiting there. The Exhibition is to be open from May 1 to September 15, and exhibits must be delivered at the Berlin Exhibition buildings between March 14 and April 10. Among the classes of work admitted are paintings, water-colours, pencil and crayon drawings, designs for stained glass windows or mosaics, architectural designs in model, drawing, or photograph. There is to be a special section for artistically illustrated publications, and for artistic designs for diplomas and other such documents. The decision as to admission will be by admission juries elected for the purpose, except in the case of works sent in by invitation of the Committee. First and Second Gold Medals are to be awarded, "in adequate number," according to the recommendation of the International Jury. This jury is to be composed as follows:

"1. Fifteen jurors have to act on behalf of the German Art Association, and will be elected by the local associations proportional to the number of exhibiting artists.

2. The foreign countries are entitled to delegate one juror to every twenty of their exhibitors, *i.e.*, for twenty or less exhibitors one juror; for forty to twenty exhibitors, two jurors, &c."

If foreign countries or local associations do not wish to send a delegate or juror at their expense, they will be entitled to nominate as juror any artist residing in Berlin who is not a member of the aforesaid jury. The Committee of the Exhibition will publish the date of the first meeting of the international jury, the number and names of its members. The cost of transport and of insurance on the journey has to be borne by the exhibitor, but all works will be insured by the Committee during the Exhibition. Every exhibitor will receive a free pass to the Exhibition. English architects should endeavour to make a good show with their drawings, not with photographs only, and show their superiority to the Germans in architectural drawing. Plans should not be forgotten, for there is no limit to the number of drawings to be sent by any one exhibitor, and space in the exhibition rooms will be ample.*

THE Americans seem to be following almost too faithfully in the steps of their beloved France in regard to academical training in architecture. The last number of the *Technology Architectural Review*, which we have before mentioned as the Journal of the Department of Architecture in the "Massachusetts Institute of Technology," gives illustrations of the designs sent in for the fourth annual competition for the gold and silver medals of the Architectural League of New York, together with the critical remarks on

* Detailed particulars as to the labelling of exhibits, the mode of package, the best agents to employ for forwarding, &c., can be had, in any language, from Herr Jobelmann, 92, Wilhelm Strasse, Berlin, W.

the designs by Mr. Bruce Price, the Chairman of the Medal Committee. The subject given was "A Pavilion in a city square to contain an heroic statue of Zeus." The design which gained the gold medal consists of a circular pavilion which is an exact copy of the order and the roof and finial of the Monument of Lysicrates, only on a larger scale and with the connecting wall removed, leaving only the open colonnade. Under this is a seated statue of Zeus of heroic size. Around this central pavilion is a circular colonnade of Doric columns with nothing on them but wooden lintels and vine bushes, forming a kind of garland round the central pavilion. Other designs represent small Classic temples or pavilions of various types, all of them pure Classic work, and tinted in the usual French style; the whole giving the impression that every effort has been made to make it appear as an emanation from the Ecole des Beaux-Arts. There is a great deal of merit in the designs, but it may be questioned whether this kind of competition is of much direct value in modern architectural training, or whether this direct imitation of an old academical system is the best line for the schools of a new country to take. Why cannot they strike out a line of their own? The most curious thing about it is that the French are just recently beginning to have qualms of artistic conscience as to this academic training in Greek temple architecture, and to suggest that the claims and conditions of modern architecture are overlooked in the École des Beaux-Arts system; and just at this point the Americans proceed to take up and imitate a system which the French are half ready to discard.

AN American technical paper has an account of the Mexican Gulf Railway, from which it appears that the bridges and culverts are built of white marble and the railway sleepers are of mahogany. There is another railway in this part of the world where the sleepers are of ebony and the ballasting has been made with silver ore. The latter, however, is only the "tip" from an old reduction works near by. Ebony also does not appear to be a very desirable wood from which to make American sleepers, or "ties," as they are called across the Atlantic, as every hole for the spikes has to be bored, a process the American engineer by no means appreciates.

WHEN, as nowadays, no one who can afford to choose seems able to live except in a bright red-brick house, and where the more "wily turns and desperate bounds" the brickwork exhibits the greater is the public estimation of it, the thought how the idols of one generation become *anathema* to the next is brought home to one by the finding of a little book, undated, and actually still in print, and to be seen in shop windows. It is called "The Masons', Bricklayers', Plasterers', and Slaters' Assistant," by one Reinnel, "architect and surveyor," and contains the following noteworthy passage:—"With respect to some other kinds of bricks used formerly for ornamental work, they were denominated from their forms as square, triangular, or curved; they were made at the fancy of the builders, and often expressly for the work in hand; but, as ornamental brickwork is now almost out of date, it is needless to say anything on the subject, as the almost general use of stucco, Roman cement, or mastic has superseded that kind of work, giving a lightness and elegance to our buildings which the most skilful arrangements of brickwork were incapable of producing."

WE doubt whether it is sufficiently realised that air-ducts for the introduction of warmed fresh air require, when that air is of the quality we at present enjoy in London, to be cleaned just as regularly and thoroughly as smoke-flues. It might seem superfluous to insist on the imperative necessity of constructing such passages so that they can be easily swept out, were it not that instances are occurring, even in important buildings recently built, where the air-inlets have proved such an intolerable nuisance from the quantity of dirt they shower forth, that it being quite impracticable to clean them, they are being superseded by other methods of heating. Without entering into the relative merits of various systems, it surely ought not to be necessary to abandon one with so much to recommend it, merely on account of such an elementary difficulty.

CONCRETE has been largely employed of late in the construction of military works in Austria and Hungary. Mr. Csongvay de Csegey gives some valuable and interesting details in a German military publication. He assigns as the amount of beton which, under certain rules laid down by him, can be mixed and utilised by the hand labour of a party of seven men, a total of 8 cubic mètres per day, or 1·14 cubic mètres (40·26 cubic feet) per man. If the amount of work to be carried out reaches 4,000 cubic mètres, it will be generally cheaper to substitute mechanical power for hand-labour in mixing. By the use of a plant consisting chiefly of a combined mortar-mill and cylindrical mixing apparatus five men can produce 77 cubic mètres of concrete (beton) daily, or about 49½ cubic feet per man. A useful hint is given as to stuccoing. It is said that if the stucco is not applied immediately the boards are removed from the face of the concrete the process had better be omitted altogether, as it is difficult to get the stucco to adhere. In cases where the concrete has to withstand water-pressure, it is desirable to coat the surface with a mixture consisting of 1 part cement, 1 part sand, and ¼ to ⅓ part of slaked lime.

THE number of accidents in the streets of London is, as the Home Secretary said in the House of Commons last week, serious. It is satisfactory to know that the Chief Commissioner of Police has the subject under his consideration, but what he can do, except put more police on duty in the streets, it is impossible to say. The fact is that the best remedies are mechanical rather than personal. Bridges, underground passages, and refuges, together with well-lighted crossings, are the best remedies for street accidents. We take it that the cost of attending to a thronged street crossing is about a hundred pounds a year in wages to the police. If this sum be capitalised it is obvious that a bridge or an underground passage would be cheaper in the long run, and would not delay the vehicular traffic as the present system does. The bad lighting of many of the thoroughfares is also a cause of accidents, as is the absence of lights in some of the vehicles which go about the streets. It is high time that more mechanical improvements in respect of street crossings were adopted.

WE are probably only at the beginning of an era of high buildings: the system of living in flats is extending, and will, there can be little doubt, become characteristic of life in large towns. It is, therefore, very desirable that the width of streets in which high buildings are erected should be considered. The high buildings of Northumberland-avenue have spoilt what might have been a fine street. In Kensington High-street, at the present time, another block of buildings is rising; if a similar block were to be erected on the opposite side the street would clearly be too dark. It has, no doubt, to be observed that these high buildings, after a certain period of time, become entitled by prescription to a right to light; therefore, the person who first erects a high block of buildings has the best chance of being unmolested in his enjoyment of the right of light. But be that as it may, it is necessary that the community, for the sake of the general appearance and health of the metropolis, should insist on there being very wide thoroughfares between high buildings, and to insure this very high blocks should be set well back from the ordinary level.

THE competition for the Public Library at Ayr is one of the cases in which the building-owners, in this case the Town Council of Ayr, have made a selection in opposition to that of the Assessor (Dr. Rowand Anderson); and in a local paper we observe that they are severely taken to task for having done so. It does not appear, however, that the Council invited Dr. Anderson to make the selection, but only to advise. We have read the detailed report of the discussion in the Council, in which it appears that no one pretended to speak of the Assessor's judgment with disrespect, but that the design placed second by the Assessor was admitted by him to be the best plan, though not the best design; and a majority of the Council preferred having the best plan. We cannot undertake to say, not having had an opportunity of examining the drawings, whether they made an unwise choice; but they were certainly acting within their rights. As we have before said, it is unreasonable for the profession to expect that any body of men will consent to the position that a building which they are to use and to pay for is to be chosen absolutely for them by another man, however competent a judge he may be, without any right to an opinion of their own in the matter; and we desire it to be distinctly understood that we cannot support any such claim on the part of architects; unless of course in a case where a competition committee have formally bound themselves to accept the Assessor's decision, which was not the case here. The Assessor's assistance was not therefore thrown away; but for him the Council would very likely have made a worse choice; as it is, the Assessor pointed out the best plan, and they have chosen it. The Assessor would have liked them to have chosen a building with an inferior plan and a better design; they prefer the best plan: they have a perfect right to do so. Every building committee that is sensible and honest, when they engage an able man as assessor, will of course give all weight to his judgment—it appears to us that the Ayr Town Council practically did do so in this case; but they are not bound to give up all right to have their own opinion on his opinion.

ON Monday last the first of what it is intended shall be a series of annual *conversazioni* was held by the Founder and Mrs. Hammond at the Electrical Standardising, Testing, and Training Institution, Faraday House, Charing Cross-road. The work of the Institution, which has but recently been started, largely consists of standardising electrical instruments,—that is to say, comparing electrical instruments such as ammeters, voltmeters, Wattmeters, Coulomb meters, Joulemeters, &c., with the recognised standards, and thus enabling public companies or private individuals to discover if they are making proper messurements. In addition to the above work the engineers attached to the Institution inspect, *in situ*, installations or new apparatus and report upon them. Again, for the benefit of those inventors who have not the private means or facilities for carrying out the experiments necessary for the development of their inventions, the Institution lets private experimenting rooms and furnishes the necessary apparatus and power. The training of electrical engineers forms an important branch of the business of the Institution. At the reception on Monday evening the guests went into a large office at the back of the building, in which Mr. Langdon-Davies showed an installation of his phonopore in action. In the large Physical Laboratory on the first floor, a concert was given, and an interesting collection of electrical appliances was exhibited by the Electrical Supplies and Fittings Company. Mr. W. H. Preece, F.R.S., had on the second floor made a complete working installation of the telegraph instruments in common use by the General Post Office; and there was also a most interesting exhibit by the General Electric

Company, the motors especially attracting notice. In one of the lecture-rooms Messrs. Elliott Bros. showed some of the chief uses made of electricity on her Majesty's ships. In other rooms were shown the Lowrie Hall apparatus as used by the House to House Company, and Mr. Ferranti's apparatus as used by the London Electricity Supply Corporation; a 150 h.-p. Ferranti armature attracted a great deal of attention. We must not omit to refer to a most beautiful exhibit of highly-finished lathes and tools by Messrs. Holtzapffel & Co.

ACCORDING to the report in the *Times* of Mr. Goschen's reply in the House last week, the Government intend to devote a large portion of their surplus arising from patent fees, being nearly 94,000*l.* in the year 1889, to build a new Patent Office. The office is now housed in the substantially-constructed quarters situated between Quality-court, Chancery-lane, and Southampton-buildings, and in Nos. 11 and 12, Staple-inn, southern side. Nos. 12 and 13 (No. 13 is the Land Registry) were erected for the Taxing-masters in Chancery, in 1843, after the designs of Messrs. Wigg & Pownall, architects. These two terrace houses are in the domestic Jacobean style, and, together with the west gate-house, form an effective and, for London, an uncommon group, standing upon a level higher than that of the inn garden. No. 11 is the oldest part of the inn, excepting the hall and the Holborn side. Its doorway is inscribed:

Reaedificata Anno Dñi 1699 —
Roberto Browne Geñ Principali.

On the setting up of a Commission for Patents under the Act of 1852, the Lord Chancellor made an order to appoint the then Great Seal Patent Office as the office of Chancery for the filing of specifications, and the Commissioners, by a subsequent order, directed that the law officers' warrants for patents should issue from the new consolidated office. Room was found for the Commission on the ground-floor of No. 25, Southampton-buildings; where, as some of our elder readers will remember, the public used to make their inspection of specifications, &c., in the long, dark corridor, a place ill adapted for such a purpose. A technical library was formed in 1855, to which some valuable additions were made by the late B. Woodcroft. For this a new building, lately enlarged, was opened on the second floor on April 16, 1867. The removal of the Chancery Registrars from the first-floor into the Courts of Justice, and the departure of the Lunacy Commission from an adjoining block —their presence there having afforded a long-standing joke about inventors and their doom—have left the Patent Office, now a department of the Board of Trade, in entire possession.

NOR do we thus hear for the first time of a new Patent Office. Concurrently with the announcement of rapidly-increasing profits, the Commissioners' earlier reports make repeated complaint of confined space, and plead for better accommodation. In 1859 a fresh site was approved, and plans and estimates were prepared by Messrs. Banks & Barry, architects, for an office, with library, to be portion of one complete design, upon the ground of Burlington House and its garden, for a group of Departmental buildings. A change in the Ministry rendered that scheme abortive. Three years later it was proposed to occupy the Fife House site, near to the Board of Trade, now covered by Whitehall-court. In January, 1884, the authorities relieved themselves of the Patent Museum, South Kensington, by handing it over to the Science and Art Department. That museum originated in an interesting collection made by Mr. Woodcroft, and which was sent to South Kensington about thirty-five years ago. As the quasi-legal character of the Patent Office has ceased with the dissolution of the Commission, under Mr. Joseph Chamberlain's Act, we can see only one reason why it should remain where it is. A large number of patent agents have established themselves round about, whilst the ready access afforded to them daily until 10 p.m. to the library—the first free library of its kind, we believe, that was opened in London—is a great convenience to them and their *clientèle*. A considerable area of vacant land lies between Chancery-lane and Furnival-street, and, as we understand, some of this, together with a few houses and their large gardens in Took's-court,* Cursitor-street, may probably be utilised for the new buildings. If the old house, No. 11, Staple Inn, be pulled down, we hope, albeit with small confidence, that the Office of Works will adopt a design somewhat in keeping with the existing features of the terrace, or else of the Inn.

IN his recent book, "Over the Teacups," Dr. Oliver Wendell Holmes makes the following pretty and fanciful suggestion as to the origin of the preference for the pyramid form in Egypt:—

"How did they get their model of the pyramid? Here is an hour-glass, not inappropriately filled with sand from the great Egyptian desert. I turn it, and watch the sand as it accumulates in the lower half of the glass. How symmetrically, how beautifully, how inevitably, the little particles pile up the cone, which is ever building and unbuilding itself, always aiming at the stability which is found only at a certain fixed angle! The Egyptian children playing in the sand must have noticed this as they let the grains fall from their hands, and the sloping sides of the miniature pyramid must have been among the familiar sights to the little boys and girls for whom the sand furnished their earliest playthings. Nature taught her children through the working of the laws of gravitation how to build so that her forces should act in harmony with art, to preserve the integrity of a structure meant to reach a far-off posterity. The pyramid is only the cone in which nature arranges her heaped and sliding fragments; the cone with flattened surfaces, as it is prefigured in certain well-known crystalline forms."

The last sentence is a little inconsistent, however, as the professed object was to show that the pyramid was a form naturally suggested in a sandy country, and the coefficient of stability of the sand-grains does not suggest the square plan of the pyramid. As a fancy, however, it is worth a record in an architectural journal.

IN the last number of *L'Architecture*, M. Jourdain writes an amusing letter with the object of persuading the architectural contributors to the May exhibitions to patronise the new *Salon* in preference to the old. In the first place, he complains, the jury of the old *Salon* are all "Prix de Rome" men, and he declines to admit that all architectural judgment and knowledge are concentred at the Villa Medici. Then he complains that the old *Salon*, to show its spirit of progress, has stopped all the free admissions which used to be sown broadcast among pupils of the École, medalled artists, every one who was "le moins du monde de la maison." The Société des Artistes Français has thus shown itself "tracassière, chipotière, liardeuse, hargneuse," and other long words of sinister signification. Worse and worse, it has practically suppressed "varnishing day" as an occasion for the brotherly meeting of artists only, the last "réunion artistique" left, and has thrown it open, through payment at the doors, "à tout ce que Paris possède de boursiers, de rastoquouères, de filles publiques, et d'imbéciles. Et Dieu sait s'il y en a!" Now at the Société Nationale all this, says M. Jourdain, is quite different,—"pour le moment," as he qualifies it. The architects will be received with open arms there, if they will only go on in a body. But M. Jourdain is afraid they will not. Architects, he says, are essentially conservative. He believes there are some in Paris who still burn candles as a protest against such novelties as gas and electricity; and he doubts whether any of them dare show themselves in the tramway leading from the Palais de l'Industrie to the Avenue Rapp.

* The Duck's-court of Ogilby's map, 1685: in Rocque's map of 1755, it is named Teuke's-court. The sponging house here, in which Sheridan stayed during the last year of his life, was at the corner, east, with Cursitor-street. There is a fine house-front, of red brick with pilasters, in the court, Furnival-street end.

BYZANTINE ARCHITECTURE.*

BY PROFESSOR AITCHISON.

Secular Byzantine Architecture.

As Constantinople was a Christian city as well as the seat of the lower Empire, we might expect that when it was taken by Mahomet the Second (May 29, 1453) all the national buildings would be destroyed, and as Mahomet and his Turks were Mussulmans that, if nothing else were destroyed, the churches would be; in fact most of the secular buildings were destroyed, but curiously enough the Christian churches were found to be so perfectly adapted to the Mussulman ritual, that a great number of them, including Sta. Sophia were converted into mosques, and the conversion they required was small, the altars, inconostases, and the ambos were removed, the Mihrab or Kibla was set out on the line of Mecca, which rarely coincides with the orientation of the Christian churches, and the step in front of the Kibla was put at right angles to it, which makes many believe that the churches are out of the square.

James Fergusson believed that many of the Turks were still housed in the old palaces; but, from domestic privacy being fanatically cherished by them, it is impossible for antiquaries to enter them, and to settle the question.

The Marquis de Vogüé has found ruins of churches, of secular public buildings, and of private houses in Central Syria; but their requirements must have been different from those of the Roman palaces at Constantinople, even if the difference of climate were alone to be taken into consideration. The nearest approach we have to the Byzantine palaces of Constantine's time is probably the Palace of Diocletian at Spalato; still there are plenty of descriptions in the Byzantine writers of parts of the Imperial Palace at Constantinople. As the Imperial Palace was of great magnificence, I will give you a description of it. Through the indefatigable industry of Labarte, particulars were gathered by him from the Byzantine authors, and from these he drew out a plan of it, as it existed in the tenth century, mainly from the description of Constantine Porphyrogenitus. An enlarged diagram of his plan is now exhibited, and I am mainly indebted to him for the description. If this description were of no other use, it would at least enable you to comprehend much of the doings of the Emperors at Constantinople, which without it would be incomprehensible. And you will also hear of the magnificence with which it was decorated.

Up to a certain period, Rome had given the ideas of sumptuous decoration to the barbarians, and to this day certain words in general use bear testimony to it. The oriel window was the window to the golden parlour of the monasteries, and these golden parlours were imitated from the gilded or gold-plated rooms of the imperial palace. We know that as early as the days of Horace, grand houses had ceilings of ivory and gold. These habits of magnificence were not given up when the Romans migrated to Byzantium; but, on the contrary, the Byzantine emperors, who were mostly of barbarian origin, tried to make up for the loss of art by the lavish use of gold, silver, enamel, and jewels. The Bulgarian peasant, Justinian, had a passion for costliness, not only in his own palace and for his own court, but for churches too, and the new Sta. Sophia having been built by him, and being the court cathedral, he spared no expense to make it sumptuous; he had all the fittings and furniture of the Bema made of gold or solid silver, and this silver was mostly gilt. Procopius tells us that 40,000 lbs. weight of silver was given by Justinian for this purpose, and he, the empress, and the whole court and its attendants were clothed in equally sumptuous apparel. This latter taste, however, was antecedent to Justinian, for, not to speak of the dresses of Diocletian and Constantine, we read in Gibbon of the Emperor Julian calling for a barber soon after his entrance into the imperial palace, when an officer magnificently dressed presented himself. "It is a barber," exclaimed the prince, with affected surprise, "that I want, and not a receiver-general of the finances," and on questioning the barber he was told that, besides a large salary and some valuable per-

* Being the Fourth Royal Academy Lecture on Architecture this season. Delivered on Thursday, February 5, 1891. (For the First, Second and Third Lectures, see pp. 82, 103, and 123 *ante*.)

quisites, he had a daily allowance for twenty servants and as many horses. The savage, and often naked, Arabs rapidly fell into this taste for costliness, and even surpassed the originators, for we read of the ambassadors of Constantine (the 7th) Porphyrogenitus, the Artistic Emperor, (916-959), visiting the Caliph El-Muktedir (917-942) in 927, and being astonished at the magnificence of his court; Lane, in his notes to the "Arabian Nights," gives the following account: "In the beginning of the year of the Flight, 305 (June A.D. 927), two ambassadors from the Roman Emperor (Constantine 7th, Porphyrogenitus) arrived in Baghdad on a mission to the Khaleefeh El-Muktedir, bringing an abundance of costly presents;" and the scenes which they witnessed are thus described, apparently, however, not without some exaggeration:—"They were first received by the Wezeer, who, at the audience which he granted to them in his garden palace, displayed on this occasion a degree of magnificence that had never before been manifested by any of his rank; pages, memlooks, and soldiers, crowded the avenues and courts of his mansion, the apartments of which were hung with tapestry of the value of 30,000 deenárs; and the Wezeer himself was surrounded by generals and other officers on his right and left and behind his seat, when the two ambassadors approached him, dazzled by the splendour that surrounded them, to beg for an interview with the Khaleefeh. El-Muktedir, having appointed a day on which he would receive them, ordered that the courts, and passages, and avenues of his palace should be filled with armed men, and that all the apartments should be furnished with the utmost magnificence. A hundred and sixty thousand armed soldiers were arranged in ranks in the approach to the palace; next to these were the pages of the closets, and chief eunuchs, clad in silk, and with belts set with jewels, in number 7,000; 4,000 white, and 3,000 black: there were also 700 chamberlains; and beautifully ornamented boats of various kinds were seen floating upon the Tigris, hard by. The two ambassadors passed first by the palace of the chief chamberlain, and, astonished at the splendid ornaments and pages and arms which they there beheld, imagined that this was the palace of the Khaleefeh; but what they had seen here was eclipsed by what they beheld in the latter, where they were amazed by the sight of 38,000 pieces of tapestry of gold-embroidered silk brocade, and 22,000 magnificent carpets. Here also were two menageries of beasts, by nature wild, but tamed by art, and eating from the hands of men: among them were 100 lions; each lion with its keeper. They then entered the palace of the tree, enclosing a pond, from which rose the tree: this had eighteen branches, with leaves of various colours (being artificial), and with birds of gold and silver, of every variety of kind and size, perched upon its branches, so constructed that each of them sang. Thence they passed into the garden, in which were furniture and utensils not to be enumerated: in the passages leading to it were suspended 10,000 gilt coats of mail. Being at length conducted before El-Muktedir, they found him seated on a couch of ebony, inlaid with gold and silver, to the right of which were hung nine necklaces of jewels, and the like to the left, the jewels of which outshone the light of day. The two ambassadors paused at the distance of about a hundred cubits from the Khaleefeh, with the interpreter. Having left the presence, they were conducted through the Palace, and were shown splendidly-caparisoned elephants, a giraffe, lynxes, and other beasts. They were then clad with robes of honour, and to each of them was brought fifty thousand dirhems, together with dresses and other presents. It is added, that the ambassadors approached the Palace through a street called the street of the 'Menárehs,' in which were a thousand menarets. It was at the hour of noon; and as they passed, the muëddins from all these menárehs chanted the call to prayer at the same time, so that the earth almost quaked at the sound, and the ambassadors were struck with fear." ("The 1001 Nights," Lane, 3 vols., 8vo., London, 1859. Note to the story of the Second Lady of the Three Ladies of Baghdad.)

I give you this extract partly because the Imperial Palace as shown is of the date of Constantine Porphyrogenitus, and partly to show you that the rarities and ceremonials of the Caliph's palace were almost a counterpart of those of the Byzantine Court. The Grand Triclinium of Magnaurus was built by Constantine the Great, and much resembled the great hall of Diocletian's Palace. It was used by the Emperors for the reception of Princes and Ambassadors, and was a vast hall formed into two aisles and a nave, by six columns on each side; at the end was a dais, reached by steps of green marble, with an apse at the back; two columns on each side of this apse supported curtains with which the end of the hall was draped.

"The Emperor was robed in the Imperial dress before mounting the throne, called the throne of Solomon, and all the Senators and grand dignitaries were there assembled. The throne was of gold, enriched with precious stones. There were birds that warbled by ingenious mechanism; close to the throne there was an enormous cross of gold covered with precious stones; beneath it were placed the golden seats for the members of the Imperial family. At the bottom of the steps of the daïs on which the throne was placed were two lions, which raised themselves on their paws and roared like real lions; not far from the throne, golden trees bore on their branches birds of different sorts who imitated the harmonious song of the birds whose form they borrowed; a great organ, enriched with precious stones and enamels, was also placed there."

The palace of the tenth century was built piecemeal. Constantine built his palace, which was largely added to by that great builder, Justinian; subsequent Emperors made additions, built new palaces, or new suites of apartments for themselves. We can easily understand that those who had murdered their predecessors had delicacy enough to prefer using new rooms which did not remind them of their crimes. These additions were made until a new palace was built at Blachernæ, on the Golden Horn, and the old palace was less and less used, until it was finally abandoned. Benjamin of Tudela, the Jewish Rabbi, who visited Constantinople in the twelfth century, only speaks of the palace at Blachernæ, and when Mahomet II. took Constantinople there were only the ruins of the old Imperial palace.

Constantine the Great, though professing Christianity, had not done away with the old Pagan worship, and was only baptised on his death-bed by an Arian bishop. In the old Roman days religion was intimately connected with every act of life, and as the Christians increased in number and power they substituted the Christian worship for the Pagan, but kept up the old custom of associating it with every act of life, so that cathedrals, churches, baptisteries, chapels, and oratories became as frequent as the old temples and shrines. You will find the Imperial Palace crowded with these new religious buildings. Eventually, the Emperors before they were crowned had to make profession of the orthodox Christian faith, and as in an ecclesiastical point of view they were inferior persons to the Patriarch, they frequently had to attend public worship in the cathedral, and to have chapels and oratories at hand to say their prayers in. The bulk of the rooms on the south side of Sta. Sophia were mainly devoted to the Emperor's use. The hippodrome acted the part of the old Roman forum, where the people assembled, and criticised the Emperor's ways, and the games were always presided over by the Emperor. The hippodrome begun by Septimius Severus was finished by Constantine the Great. It had a great influence on Constantinople, for Constantine set out his palace at right angles to it, and subsequently Sta. Sophia was set out in the same way parallel with the palace. The hippodrome was once a museum of art; the horses of St. Mark, which were taken by Theodosius II. from the island of Chios, came from it, now nothing remains but the obelisk, the bronze tripod of Delphi, with headless serpents, though one head is in the museum, and the built obelisk of Theodosius stripped of its brazen covering. The palace was not one building with an architectural front, but was a conglomeration of buildings, open areas, passages, baths, churches, and oratories, stables and gardens. The main group consisted of three palaces called the Chalce, the Daphne, and the Sacred Palace; this last is considered by many as the palace proper, but the Hippodrome, the Forum Augusteum, the Baths, the Cathedral, and the Palace were joined together, and really formed a sort of whole, while smaller palaces were dotted about the grounds, and were called the Aetos, the Boucoléon, the Porphyry Palace, and the Penta-coubouclon.

I think the simplest plan will be to begin with the Hippodrome, and describe the position and collocation of the parts.* It had the form of the Roman circus, only the triumphal gate at the south end was obliged to be left out on account of the steepness of the ground. It had four gates, two to the east and west, nearly opposite the south meta, the south-east gate being called the Gate of Death, for though Constantine had abolished the gladiatorial games, it seems that the name of Porta Libitinensis was still used; it was originally so called because the bodies of the slaughtered gladiators were taken out through it; and two gates, also east and west, at the north end, nearly in a line with the platform in front of the Emperor's throne. At the back, farther north, was the Palace of the Cathisma, and beyond that the Baths of Zeuxippus. The north-east angle of these baths touched the south-west angle of the Forum Augusteum, a moderate-sized square, about 623 ft. from east to west, by 460 ft. from north to south, about the size of the Place Vendôme at Paris. The Forum was surrounded by a peristyle or cloister; on the south side it bounded the Palace of the Chalce; on the north Sta. Sophia, the Emperor's rooms, however, projecting into it; on the east it touched the face of the Senate House, the Church of St. Mary Chalcopratiana, and the front area of the grand Triclinium of Magnaurus; on the west side I know not what it touched, but on this side were the chapels of St. Constantine and St. Mary of the Forum. This Forum of Augustus contained most of the sculpture and statues that had been taken from the different provinces of the Roman Empire by Constantine to adorn his new capital. To the south of the Chalce was the Palace of Daphne, and to the east of these two the Sacred Palace. The Palace of the Chalce was almost entirely rebuilt by Justinian after it had been burnt in the riots of the Nika, and was entered from the south-west corner of the Forum Augusteum by an iron door; the Atrium ended at the south by a hemicycle covered by a semi-dome. South of this was a domed hall (No. 20), ending southwards with a smaller hemicycle. I here give you the description of it from Procopius (Lib. I., cap. 10):—"As, according to the proverb, we know the lion by his claw, so my readers will learn the magnificence of this palace from the entrance-hall. This entrance-hall is the building called Chalce; its four walls stand in a quadrangular form, and are very lofty; they are equal to one another in all respects, except that those on the north and south sides are a little shorter than the others. In each angle of them stands a pier of very well-wrought stone, reaching from the floor to the summit of the wall, quadrangular in form and joining the wall on one of its sides: they do not in any way destroy the beauty of the place, but even add ornament to it by the symmetry of their position. Above them are suspended eight arches, four of which support the roof, which rises above the whole work in a spherical form, whilst the others, two of which rest on the neighbouring wall towards the south and two towards the north, support the arched roof which is suspended over those spaces."

From this vestibule to the westward you enter into the oratory of the Saviour (No. 21), containing the tomb of the Emperor John Zimisces (969-976); to the north and east of this was the Noumera (No. 22), used as a prison; from the vestibule to the east you entered through a splendid bronze door into (No. 23) the Triclinium of the Scholars. They were a part of the Prætorian guard. At the south-west end of this was the chapel of the Apostles (No. 24); to the east of the Triclinium of the Scholars was a passage (No. 26), and the lychnos (No. 25), where the Emperor received the homage of his servants and bestowed dignities on them; to the east of this was the Triclinium of the Excubitors (No. 27), another band of Prætorians, and that of the candidates (No. 28), a cohort of the Emperor's guard; at the west end of this hall was a dome on eight columns, under which was a great silver cross. No. 32 was the grand consistory, and had three ivory doors. At the end was the Emperor's throne, covered by a cyborium, where he received the homage of the great officers of the crown. No. 34, at the side of it, was a large dining-room, where the Emperors dined the dignitaries on festivals; in front of these four halls last-mentioned was an open yard, about 65 ft. wide, divided in the middle by a fence and gate, called the curtains, through which the Emperor occasionally rode; it was

* See the lithograph plan published with this number.

prolonged up to (No. 35) the Church of Our Lord, the Royal Chapel, up to the time of Basil the Macedonian (867-886). At the back of this church was a passage that led into the Phiale of the Sacred Palace, but by passing through the sacristy of the church one entered the Heliacon, or open area of the grand Triclinium of Magnaurus (No. 116), the splendours of which I have before described. On entering the Palace of Daphne from the hippodrome, by the door 39, you come into a large open court (41), having a guard room called the porter's lodge in the south-west angle (No. 40), and to the south of this was the covered hippodrome of the palace (No. 42) originally used by the Emperors, but it afterwards served as a shelter for the Senators' horses when the Senators waited on the Emperor at his palace; at the west corner of this was a staircase (111) by which a garden called Phiale was entered; 44 A and B are open courts with peristyles, 45 is the ancient chapel of St. Mary of Daphne; 46 is the oratory of the Holy Trinity; 47 the baptistery, and 114 a staircase leading into the Justinianos (No. 109); 48, the Triclinum Augusteos, was a vast hall used for receiving the homages of the functionaries, and was often used for crowning the Empresses; 50 was an octagonal hall, and 51 the Emperor's bedroom, where he left his imperial robes and crown, after attending service in state at Sta. Sophia; 52, a long open corridor or peristyle, which led to 54, the Church of St. Stephen, that preceded the platform of the Cathisma Palace, and overlooked the race-course; from the windows of this church the ladies of the court saw the races and games. The Emperor Heraclius was crowned here, and it was used for celebrating the marriages of the Emperors. Above, to the north of this open corridor, No. 52, and between the Palace of the Chalce, were the remaining open courts and chambers of the Palace of Daphne; 38, the Grand Triclinum of Nineteen Couches; it was divided into three parts; 38A was the portico, 38B the dining-room, and 38C the bedroom. Here the Emperor entertained guests at Christmas. All the plate used was of gold, and fruit was served in three gold vases, so heavy that they had to be wheeled on carriages, which were covered with purple, and they could only be lifted on to the tables by gilded leather ropes and pulleys; there were two silver columns at the end, between which was the Emperor's throne. It was not only used for grand dinners, but for grand receptions; many of the Empresses were crowned here, and the Cæsars were here installed. I may say that at the close of the old Roman Empire, and during the continuance of the Lower Empire, the second of the joint Emperors was called Augustus, and the heir to the throne, Cæsar. For instance, Constantine was made Cæsar by Galerius, but claimed to be made Augustus; and the same dispute took place between Constantius and Julian. In this Triclinum of the Nineteen Couches, deceased Emperors were laid in State.

The Sacred Palace had an atrium semicircular at both ends. No. 60-61, which was called the mysterious phiale of the τρίκογχος, or triple shell, its mysteriousness was probably owing to its acting as a whispering-gallery. The original meaning of the word phiale was a saucer, or round, flat drinking-cup; but the word was afterwards used for the flat basin of a fountain, and then for any open space with a fountain in it. The triple shell applied to the half domes of the apses; there were three apses. I believe κόγχος is used when the inside of a squinch is hollowed out like a shell. From the north side of this you entered into the Chapel of St. John (65), and from the south side into the baths (63); in the parts behind the hemicycle (67), A was a guard-house, and B a door to the under part of the terrace of Daphne. There was also a door into the hemicycle; 62 was similar—A, door to the under-portico of Daphne; B, door to baths; there was also a door into the hemicycle, and another into the courtyard. The phiale was also used for the games played before the Emperor and his friends. Two flights of steps round the eastern hemicycle led into the sigma (71), a large and long room, with apses at both ends, and three doors on its east side, so called from its resemblance to the old Greek sigma, or C; fifteen columns of Phrygian marble supported the ceiling, the walls were lined with precious marbles, on which verses were engraved. At the south end two bronze lions' heads spouted water into a vase, and in the middle was a little edifice of four columns supporting a dome, under which the Emperor's throne was placed when games went on in the courtyard; in front of the throne was a balcony (No. 70); to the north of this was the Triclinium Eros (79), used as a museum of arms. From the south end was entered No. 64, called Triclinium Pyxites, used as a vestry by the clergy of the palace. The two side doors that led into the triple shell were of bronze, the middle one of silver. The room itself, the triconque (73) was a hemicycle, from which three apses were recessed; the half domes of these were called the shells or conchs. Two columns on each side of the east apse carried the archivolt, and this apse had steps or seats round it; the walls of this Triclinium were covered with various coloured marbles, and its ceiling was gilt, and pierced for light. The Emperor Theophilus (829-842) built this part of the Sacred Palace, and used to work here with his ministers. This probably also acted as a whispering gallery, as well as the room under it. To the east was a T-shaped gallery (74); to the north of this gallery were the offices (77) A and B, with an open court, C, in the middle; to the south (78) were the kitchens, lit from the garden. The north end of the top of the T-shaped gallery ran into another very long gallery, called "The Gallery of the Forty Saints" (80); to the north of this passage was the "Pearl" (No. 81), or an apartment wholly built by Theophilus (829-842), surrounded on three sides by passages, and on the fourth by the gallery of the Forty Saints. It consists of an ante-room, a bedroom, and a sitting or dining-room. The roof of this dining-room was supported by eight columns of Rhodian marble (black and gold), and its walls were covered with marble mosaics of animals. The bedroom was vaulted, was carried by four marble columns, and was gilt, or of gold mosaic. Out of the third apse of the three-shell Triclinium were the upper winter rooms of the same Emperor (83), called the Carian, from being lined with Carian marble; and to the east of it was the gallery (84). To the east of this was the "Camilas" (85), consisting of an ante-room A, and a vast hall lined with verde antique, with six verde antique columns ing the roof; above the marble lining were mosaics of people eating fruit; at the south end was a double apsed oratory to the Virgin and St. Michael (85 B). Under it, on the ground-floor, was a room converted into a library by Constantine Porphyrogenitus; beyond (No. 86) was the coubouclion mesopatos, the ceiling carried by four columns of Phrygian marble; the wall was covered with gold mosaic, on which were trees of verde antique; 87 was the Empress's dressing-room, and below it was her bedroom, called the mosaic-room; the vaulted ceiling was supported by seven columns of Carian marble, its walls and roofs were covered with mosaic, and its floors are said to have resembled a meadow enamelled with flowers; 88 contained a room and an oratory to St. Agnes. The last (89) had a staircase for the Empress on one side, and the remaining part was decorated like the former chamber, and had to the south a vestibule into the garden, through which she could go under the triclinum Lausiacos to the Cenourgion (100 to 104). The Lausiacos (92) was a long passage, the north end of which went into the gallery of the Forty Saints, and the south into the grand triclinum of Justinian; in the middle of the garden to the east of the former rooms, and nearly opposite 86, was a garden pavilion (90) with two rooms on the ground-floor and two above. This passage Lausiacos separated the golden triclinium or throne-room from the part connected with the triconque. To the west of this passage, and adjoining the kitchen, is the oratory of St. Basil (93); to the east is (94) the tripeton, horologion, or vestibule to the throne-room. The Patriarch waited in the tripeton while he was being announced to the Emperor. The throne-room (95) was entered on the west by a silver door, the work of Constantine Porphyrogenitus. It was an octagon enclosed in a square, its interior is not unlike St. Vitale in plan: on each of its eight sides were apses; above the arches of the apses was an entablature whose projecting cornice formed a circular gallery round the hall used on grand occasions by the Empress and her ladies; the dome, which rose from the back of this, had sixteen windows. The west apse (A) formed the entrance, and its front was covered by a purple curtain, hung by silver rings, called the curtain of the Pantheon, or the Pantheon only; there was another doorway into this apse to the north, communicating by an irregular-shaped room with the "Passage of the Forty Saints." As each of the apses of the throne-room were enclosed by curtains they formed separate rooms. B was used as the vestry of the Patriarch. C was the entrance to the Emperor's private apartment; when the Emperor gave a grand banquet, the musicians were here, and in B; the apse D was called that of St. Theodore, and was used as the robing-room of the Emperor; at the back of it was the oratory of St. Theodore (96), the Emperor's robes, his crown, his arms, two shields of enamelled gold, and all the arms and insignia of office of the head officers of state were kept here; the apse E had a silver door of two leaves, which led to the Heliacon of the lighthouse (105); this apse had a picture in mosaic of Christ on his throne, to which the Emperor prayed on entering or retiring, and in this apse was placed the imperial throne. The apse F is supposed to have communicated with a staircase (97) to the gallery.

99 is another staircase communicating with the dining-room of the cenourgion, and it is supposed that the Empress and her court went into the gallery on great occasions. Apse G communicated with the "Gallery of the Forty Saints." H is supposed to have held the porter of the Sacred Palace, and, when he was absent, the keys of the palace; the pavement was designed in the 10th century by Constantine Porphyrogenitus, and seems to have been of Opus Alexandrinum, bordered with silver; the walls and vaults were covered with mosaic, and from the centre of the cupola hung a huge candelabrum called Polycandelon. Basil, the Macedonian, after having murdered his colleague and benefactor Michael the 3rd, did not care about living in the late Emperor's apartment, and had one built to the south of the throne-room, which was called the cenourgion. This apartment afterwards became the private dwelling of the Emperors, until they migrated to the palace at Blachernæ. The first room of the apartment, No. 100, was the Emperor's private dining-room, entered from the tripeton, which also communicated with an irregular chamber (99) in the outer square of the throne-room. No. 101 was called the makron, or long gallery of the bedroom, and touched the narthex of St. Mary of the lighthouse (106), from which it was shut off by silver doors. No. 107 was the Chapel of St. Demetrius, across which the narthex before mentioned extended. From the makron the door into apse C of the throne-room opened. The dining-room and makron must have been lit from the roof. Constantine Porphyrogenitus gives the following description of the vast hall, No. 102:—"It is sustained by sixteen columns, disposed at equal distances. Eight are of verde antique, and six of onyx, sculptured with branches of the vine, in the middle of which all sorts of animals disport themselves. The last two columns are also of onyx, but the artist has decorated them with oblique stripes; spiral reeds or flutes, I presume; in all this work variety of form has been sought as an additional pleasure for the eye. All the hall from the top of the columns to the vaults, as well as to the east cupola has been ornamented with most beautiful mosaics, representing the orderer of the work, enthroned in the midst of the generals who had shared the fatigues of his campaigns; these present him the cities he has taken as an offering; immediately above, on the vault, are reproduced the herculean feats of arms of the Emperor, his great works for the happiness of his subjects, his efforts in the field of battle, and his victories granted by God." To the east of this hall is a little vestibule, 103, which preceded the bed-room; its ceiling was a cupola, in which doubtless were windows; the mosaics which decorated the walls were remarkable for the composition of the subjects and the harmony of the colours. Constantine Porphyrogenitus had constructed in this vestibule a basin of porphyry, surrounded by marble columns, admirably polished; the water-pipe was hidden by a silver eagle with its neck turned aside, and with the proud air of a lucky hunter it held a serpent in its claws. The rooms 103 A and B, were serving rooms, one of which had a staircase in it, for although the throne-room was on the ground, the ground sloped so rapidly to the sea that here it admitted of there being a lower storey. Constantine Porphyrogenitus has also left an account of the bedroom (104):—"The bedroom built by the

The Imperial Palace at Constantinople.

- FROM - LABARTE -

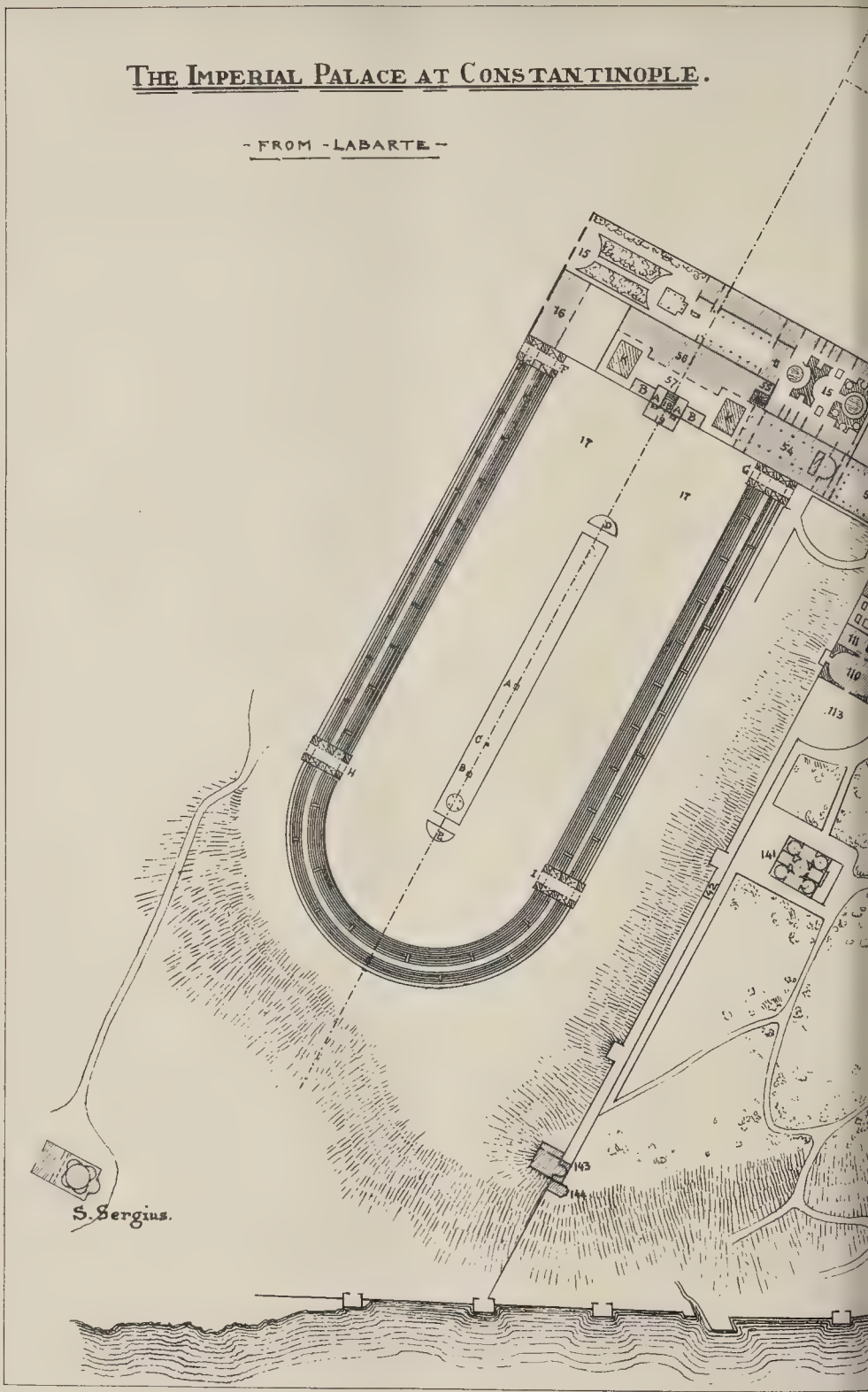




PHOTO LITHO SPRAGUE & Co 22 MARTINS LANE CANNON ST LOND E C

Emperor Basil is a veritable master-piece of art. Over the ground in the middle a peacock spreads itself—a fine piece of mosaic. The bird of Medea is enclosed in a circle of Carian marble. The streaks of this stone stand out in such a way as to form another larger circle. Outside this second circle are what I shall call brooks of the green marble of Thessaly, which spread themselves in the direction of the four corners of the room. In the four spaces formed by these brooks are four eagles, rendered with such truth that one could believe them living, and ready to fly away. The walls on all sides are covered at the bottom with slabs of glass of different colours, which reproduce different sorts of flowers. Above these is a different work, of which gold is the ground, which separates the ornament of the lower part from that of the upper part of the hall. One finds in this part another work of mosaic on a gold ground, representing the august orderer of the work upon his throne, and the Empress Eudoxia, both clothed in their Imperial robes, and with crowns on their heads. Their children are shown round the hall, having their Imperial robes and crowns. The young princes hold in their hands the books containing the divine precepts, in the practice of which they have been brought up. The young princesses also hold similar books. The artist has, perhaps, wished to make it understood that not only the male children, but those of the other sex have been initiated in the holy writings, and have taken part in the teaching of Divine wisdom, and that the author of their days, although he was not able, on account of the vicissitudes of his life, to addict himself early to literature, has, nevertheless, wished that his offspring might be instructed, and has also desired that the fact might be patent to all, through this painting, even though it was recorded in history. These are the embellishments which are seen on the four walls as far as the ceiling. This ceiling, which is square in shape, is flat. It is resplendent with gold. The cross, which gives victory, is reproduced in green in the middle. Round the cross the stars are seen, like those which shine in the firmament, and there the august Emperor, his children, and his imperial companion lift their hands towards God, and towards the divine symbol of our salvation."

We should give him more credit for piety if he had not had his benefactor murdered.

105 was the Heliacon of the Lighthouse; it was a vast peristyle forming an atrium to the Church of St. Mary of the Lighthouse and the Chapel of St. Demetrius. It had a doorway at A, sheltered by a porch by which the Sacred Palace is left.

106, the Church of St. Mary of the Lighthouse, became the Imperial Chapel of the Palace after Basil the Macedonian had built the Cenourgion. The main door of the church was of ivory. In the church was kept an enamelled crown of gold and a great cross, the handiwork of Constantine Porphyrogenitus.

107 was the Chapel of St. Demetrius. Here an enamelled image of the Virgin was kept, near the entrance door. The chapel had a trefoiled apse.

108, the lighthouse. In Asia, on the other side of the Bosphorus, was another lighthouse, and there were a succession of them up to the confines of Cilicia. By their means intelligence could be conveyed to the Emperor of the incursions of the Saracens. Polybius describes the way of signalling by means of lights (Polybius, Lib. 10, cap. 43–47).

We must now go back to the Lansiacos (92); the south end of this abuts on 109, the Triclinum of Justinian III.; this was commonly called the Justinianos. It was a covered gallery about 70 ft. wide, and 336 ft. long, running westwards; it was occasionally used for banquets, but more generally for properly arranging the persons or bodies that were going in processions to the Emperor; its west end abutted on a vast vestibule called Scylla (110), one of the entrances from without to the Sacred Palace; from the north side of this vestibule there was a door to the staircase (111), and, on the south side, another to a raised terrace (113), level with the top of the enclosing walls of the Palace; this terrace faced the east side of the great Hippodrome, No. 17. From the end of this terrace ran an open passage southwards to the extremity of the hill (142); the lower part of this was called the Peridromes of Marcian; the upper part was level with the terrace (113), and was called the exterior gallery of Marcian. At the south end of the Peridromes was a chapel built in one of the towers of the wall, dedicated to St. Peter (143), and to it was annexed an oratory (144) dedicated to the Chief of the Heavenly Host; above this was an oratory dedicated to the Mother of God.

The description of the Palace is now completed, with the exception of the outlying buildings, including the Emperor's baths (125). I may here mention that the Porphyry Palace (No. 140) lies to the south, on the shores of the Propontis, and is nearly touched by the north and south meridian of Sta. Sophia when prolonged southwards. It was a small square palace with a pyramidal roof; its walls were wholly covered with slabs of porphyry, brought from Rome, and the floors were also paved with porphyry. This palace must have been dismal, and, one would think, not calculated to promote the health of the imperial scions. On the approach of winter, the Empress used to assemble in it the wives of the great dignitaries, and present them with purple robes. This palace was built by Constantine the Great for the use of succeeding Empresses during their confinement, and those sovereigns who, like Constantine VII., were born there were called Porphyrogeniti. 128 is the new Basilica; 137 the chapel of Elijah the Tishbite; 138 the oratory of St. Clement; 139 the victory of the Saviour.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

WROUGHT-IRON WORK.

THE eighth ordinary meeting of this Institute for the present session took place on Monday evening last, at 9, Conduit-street, Mr. Alfred Waterhouse, R.A. (President), in the chair.

Mr. W. H. White (Secretary) read a letter from Madame Schliemann, expressing her thanks for the Institute's condolence with her on the death of her late husband.

The Secretary also announced the decease of Mr. Thomas Searancke Archer, Fellow.

Mr. J. Starkie Gardner then read a paper entitled "Wrought-Iron Work: the Mediæval Period," of which the following is an abstract:—

The author endeavoured to establish that the use of decorative ironwork as an architectural accessory originated in England, and was well developed before the Norman invasion, and that almost down to the middle of the twelfth century it was pursued apart from changes in architectural style. Decorative ironwork of this period is distinguished by the use of animal forms and of superstitious symbols; by its crude design combined with skilful execution. The ornament was probably invented by the artisan. Designs associated with late Norman architecture are more refined, and beaten iron foliage is sparingly introduced. French ironwork was at first inferior, and English forms were borrowed: these became extensively modified as they travelled farther from their centre of origin. A peculiar style of open-work hinge was developed with the Romanesque architecture of the South of France. The late Norman period saw the first introduction of grilles or screens of iron into cathedrals. These were at first formed of massive welded scrolls and bars, and subsequently of light scroll-work. The birth of Gothic architecture in France introduced a far higher order of design in the ironwork. The celebrated hinges at Durham and Worksop are the oldest examples of the new style in England, and scarcely appear to be of home production. They are the first to present a modelled surface on the iron, which was struck while hot into dies, as wax is pressed into a seal. This stamped work was exceedingly rich, and culminated in the hinges of Notre-Dame. It reached England some time previous to 1294, when the Eleanor grille was made by John de Leghton, the only smith to whom any stamped work can be attributed with certainty, and to whose hand all the specimens in this country may be attributed. Imitations were made by those who had not learnt the secret of stamping iron. These imitations merged into the simple forms in which fleur-de-lis were so prominent. The art of stamping did not pass into the south of France, Italy, or Spain. It was taken up in Belgium and brought to great perfection, though few specimens exist; but the art was never acquired in Germany, where richly foliated hinges inspired by French examples were beaten out without the use of stamps. A few grilles of Norman design are found in Spain, but nothing else until shortly before the Renaissance. In Italy the oldest grilles were reproductions in iron of originals that were in marble or wood, and of Eastern origin. Early in the fourteenth century the quatrefoil grilles appeared in North Italy, and for a time superseded all others; but after about a century iron was again generally replaced by bronze or marble in that country. These quatrefoil grilles, together with other varieties taken from Eastern joinery, found their way through France eventually to England, and, with the imitation of architectural form in iron, led probably to the marked decay of smithing apparent in both countries. The Flemish, and particularly the Brabançons, led by the Matsys, took up the craft with great vigour; and while little was made in England except the railings of perpendicular bars, which formerly crowded Westminster Abbey and Canterbury Cathedral, some very important works, such as the St. George's Chapel and the Ely gates, were exported to us from Flanders. Iron was also first used on a large scale for constructive purposes in roofs and spires in Bruges, Ghent, and Antwerp. The beautiful locks and caskets, with carved iron figures and tracery, originating in Brussels and Louvain, were produced in France with far greater intricacy and refinement of design, and led to a magnificent revival of the smiths' art in that country. The Belgian style was also welcomed in Cologne and in all the frontier towns, and profoundly stimulated and impressed ironworking in Germany. The Cologne ironwork consists at first of poorly-executed tracery associated with a pierced ornament taken from the thistle. This latter became so popular that German smiths used it universally and modified it in every direction, to the exclusion of the vine, which, borrowed from French work, had until then reigned supreme. The thistle, associated with lattice or debased tracery grilles, held its place until the Renaissance, when still richer forms, like the Passion flower and the peculiar interlacing work, displaced it. While the transition saw smithing in its highest perfection as a national art in Germany, and the birth of a still more magnificent development in Spain, it witnessed its complete decline in England, France, and Italy.*

Mr. William White, F.S.A., in opening the discussion, said he was glad to have the opportunity of expressing his great obligations to the lecturer for bringing together such an interesting sketch of the history of "Art Iron-Work." He was not quite sure, however, that he agreed in all the conclusions which had been brought forward by Mr. Gardner. He had come across some very fine specimens of mediæval iron-work at Siena, Florence, and other places, which, though not of a very elaborate nature, were at the same time very good. He well remembered one of the doors, which had iron bands, locking by three or four successive locks, passing over each other, and affording very great security. In Switzerland there was a considerable amount of ironwork of the later kind, but following closely on the mediæval precedents. At Lucerne, a fine screen was to be found in the cathedral. Reference had been made to the Danish ironwork, and he remembered seeing at Copenhagen a wonderful piece of ironwork, round a balcony on the Church of the Holy Trinity. This, he believed, was sixteenth-century work, every panel being about the size of a small hurdle, with different patterns in almost every case. Mr. White concluded by proposing a vote of thanks to Mr. Gardner for his valuable paper.

Mr. Charles Fowler, in seconding the motion, referred to the characteristic iron-work of South Germany, ranging up towards the end of the sixteenth century. Its peculiar characteristic was that the scrolls were intricate. They made a great number of turns, but a little leaf-work was introduced. This ironwork was entirely made with round iron, threaded at the intersections, but not welded there. The panels were almost invariably crossed by diagonal rods, which passed through several scrolls, with a great many turns. The effect was peculiar, and it might be classed almost as a style by itself. He remembered some elaborate screens,

* The paper was illustrated by a large number of interesting illustrations shown by means of the oxyhydrogen lantern. Some of these illustrations, viz., doors to cloister, Durham Cathedral; door of Chapter-house, York Cathedral; and wrought-iron hinges at St. Mary's, Norwich, were published in the *Builder* for May 11, 1889, together with a previous paper by Mr. Starkie Gardner, read before the Architectural Association.

at Augsburg Cathedral, formed in this way, and the style, no doubt, was well-known to those who had travelled in Southern Germany.

Mr. James Neale, F.S.A., said he was sorry that they had not had an illustration of a well-known hinge in the south transept of St. Albans. The last time he was there he observed it thrown on one side in the churchyard, and going to decay. It had, unfortunately, been stowed away by a very eminent amateur, who very likely substituted something else for it.

Mr. Ralph Nevill, F.S.A., said he was very pleased to hear the lecturer ascribe the origin of the early wrought ironwork of this country to the Norsemen rather than to the Celts, of whom people heard so much nowadays. It was pretty well admitted that the art came in with the Norsemen and Danes, who had acquired it through their intercourse with Byzantium and the East. Mr. Gardner had referred to a subject which ought to cause no inconsiderable shame,—namely, that there was only one reproduction of an English hinge at the South Kensington Museum. Those who had studied there in the old days knew that there were a great many German works at the Museum, some of a very curious character, and some exceedingly ugly and undesirable to be placed before students, although they were very considerable specimens of skill in the use of metal. It was a shame, he thought, that English art was not exhibited by the authorities at South Kensington, because it certainly was equal to any art in the world. It was more suited for founding the new English art upon, and for English artisans to get their ideas from. Instead of that, however, they found specimens of foreign work scraped together from all countries. It might be said that Englishmen could go and see English art, and not foreign art; but that was not the case, because workmen and students could only to a small extent inspect the specimens of English art scattered throughout the country. He should like a determined effort made to get together a good collection of English art, and he ventured to hope that the book Mr. Gardner was preparing for South Kensington (although no doubt he would give a great many specimens illustrating the arts of foreign countries) would yet contain still more specimens of English art, which he (the speaker) ventured to think, was quite equal to anything which was to be found abroad.

Mr. H. H. Statham remarked that one thing which must have struck every one in the long series of illustrations they had had that evening, was the almost entire absence of anything like realistic treatment of natural forms. He was on the look-out for it during the whole evening, seeing that specimens were brought from various schools and dates, but they had scarcely a bit of it until they came to the big German thistle. In most examples produced there was simply the treatment of iron-work in scrolls tangential to each other, with a principle of growth, but without any imitations of natural forms. Now that was, he considered, one of the lessons to be learned from these examples, and it was a lesson which seemed to be very much wanted in the present day; because when the German took to great lumpy foliage and realistic thistles, he, at all events, did it consistently,—it was realistic as much as he could make it. But what had very much struck him in recent iron-work, even in places where they might have expected to find the very best taste, was that people were found designing a very admirable piece of iron-work, as it first appeared, entirely free from realism, but they could not apparently get rid of some of the little realistic leaves and tendrils, which they would stick in somewhere. He had seen it even at the "Arts and Crafts," which was supposed to be the home of pure taste in decorative art. Now, that was what he could not understand. He could understand a man going in for absolute imitation of foliage in wrought iron-work,—he was a miserably-misled man if he did, because it was a horrid thing to do—but he could not understand a man avoiding realism entirely for the greater part of his work and then going and spoiling the whole thing by sticking in it a bit of realistic fruit and flower. That was joining together two methods of working which had no relation to each other in any way, and it was so often seen in the revived wrought iron-work of the day that anyone who felt strongly on the matter should exhort those who were designing and executing iron-work at least to keep their work in one plane, so to speak; that when they avoided realism and went in for pure design they should leave it so, and not spoil it by putting in those stray bits of natural branches which disappointed and annoyed people when they were in the enjoyment of a fine design.

Mr. Langton Cole supported the vote of thanks, and asked Mr. Gardner if he had altogether abandoned the theory which he enunciated in his paper read before the Architectural Association two years ago,—that in the Early Gothic period England had led the way in wrought-iron work? At that time, indeed, Mr. Gardner had suggested that it was extremely probable that the great doors of Nôtre Dame were English. He pointed out that they were generally attributed to the devil, but that it was believed they came from England, and as they were a very fine piece of work English architects were naturally very proud of them.

The President, in putting the motion to the meeting, said he entirely agreed with what the speakers had said as to their indebtedness to Mr. Gardner, and he only hoped that that gentleman would favour them with another paper on iron-work. It was interesting to hear Mr. Gardner say that the screen, Westminster abbey (tomb of Henry V.), was looked upon as one of the most satisfactory specimens of iron-work in existence. It had always appeared so to him, and he was pleased to learn that there were many examples of the same class of work, and, probably, by the same hand, in this country.

The vote of thanks was then put and carried by acclamation.

Mr. Gardner, in replying, said he was at present engaged in making a copy of the grille at Winchester Cathedral, in front of St. Swithin's shrine, for the South Kensington Museum, and he was trying to make the copy so as to reproduce all the different accidents of smithing which occurred in the original, so that the copy should be a faithful one. It was certainly the earliest type of a grille known. It was the rudest, and it occurred in association with very early buildings in many places in France and Spain; while the more simple Lincoln type, with its monotonous scroll, was always associated with later work. The Lincoln grille used to be described to every visitor by the verger as being of 1490 date, but this was so obviously ridiculous that he got one of the canons to look into the matter, who found that the date had been misread, and that the passage relied on related to the removal of some other iron-work, and not to the erection of any. In reply to Mr. Fowler, he had stopped short at the Renaissance. His subject terminated before the work of that period began. Mr. Neale might be glad to know that two of the hinges, engraved in his work on St. Albans, were in the South Kensington Museum. He had mentioned in his lecture that he was instrumental in obtaining them from St. Albans for the Museum. He most cordially endorsed everything Mr. Statham had said. In his (the speaker's) lecture in Birmingham at the Art Congress, a few months ago,* he took for his text that they should not introduce realistic foliage into design, nor take their subject straight from Nature. He had found, in designing, that one could not go to Nature and use the crude forms to be found there. However beautiful they were in themselves, when deprived of life and of the charms which surrounded them, and put as mere dead forms, they always seemed more or less out of place. In his early days he used to think that the right thing was to imitate the oak and other leaves, and introduce them into iron-work, and when there was little doing he designed and had made for stock leaves and shells and other things which he thought would come in some time or other in works to be executed. He found, however, that it was impossible to use them readily, as they had to be very greatly modified, softened down, and idealised to be of any use. The idea that more attention should be paid at South Kensington and the other museums to English art was one with which he cordially agreed. When foreign visitors went through the English museums, and saw no rooms devoted to English art, they could only go away with the impression that the English had no art, or they would be glad to show it. When, however, they visited France, Italy, and Germany, they did not see the art of other countries put forward in the most prominent places; but first the art of the particular country, and then the national collections, were supplemented by specimens from other countries. He hoped sincerely that they would see the day when the largest and finest rooms in South Kensington and the British Museum would be given up to the collections of English art. Many of the phases of English art were not even alluded to in the text-books, and one could only discover them in some of the mansions or out-of-the-way places where the collections were scattered over England. As to Mr. Cole's question, he (Mr. Gardner), as stated in his paper, had recanted the particular views referred to, and had now come to the conclusion that he was then on the wrong track. In conclusion, he would like to impress upon all interested the necessity for preserving these fine old examples of hinges, which were passing away every day. In one case he could name, a fine hinge was so loose that that any one could take the whole of it away in a carpet-bag if he chose. The least they could do, then was to take rubbings of them, or, better still, paper casts, which was a very easy process.

The President then announced that the next meeting would take place on the 2nd proximo. The meeting would be a special general one to elect the Royal Gold Medallist for the current year, and a business meeting for the election of new members, after which Mr. Somers Clark would read a paper on "Seville Cathedral."

* See *Builder* for December 27, 1890, p. 492.

THE ARCHITECTURAL ASSOCIATION VISITS:

NEW BUILDINGS ON THE EMBANKMENT.

The first visit of this Session brought together, on the afternoon of Saturday, the 14th inst., a large number of members for the purpose of inspecting Messrs. Hobbs & Co.'s newest example of colossal construction, of which Messrs. Perry & Reed are the architects, which will shortly occupy the place of, and also completely obliterate, Salisbury and Cecil-streets, Strand. The scheme provides for the erection of three large blocks of buildings, two of which will be at right-angles to the Strand, with a carriage roadway between, whilst the third block adjoins the Savoy Hotel, and faces the river and the Embankment gardens. The roadway will be approached by the old entrances of Salisbury and Cecil-streets, whilst the block of houses in the Strand will remain to screen the new settlement from the heavy traffic of the main thoroughfare.*

The question of foundations, which in this case was an important one, excited much interest; the piles upon which the old and comparatively light buildings had rested, with a 4-in. plank between, were being replaced by solid masses of concrete, 30 ft. thick and in some cases 16 ft. broad, to receive the new structure. The western block of the two first mentioned, has just been begun, and for that purpose within the last few weeks Salisbury-street has nearly disappeared; whilst the entire destruction of Cecil-street must precede the erection of the eastern block. These two blocks will consist of flats and a small theatre. The south block will be devoted to hotel purposes. Owing to the slope of the ground, the basement, containing the offices and servants' sleeping chambers, though below the road-level on the north, will be well lighted above ground on the south. The ground-floor contains dining, billiard, and reading rooms, with reception-rooms on the first-floor. A main staircase and two subsidiary ones connect all the floors, and there will be, in addition, two passenger-lifts. The bed-room floors have two areas for light placed in the centre of the blocks, and for ventilation and light two shafts will be formed under the domes at each end of the structure.

The elevations are treated with red brick and Portland dressings, above a basement with a battering and rusticated face. We are inclined to regret the placing of such a massive and lofty building in its present position, where it will stand out of line with and overbalance most adjoining buildings, and hide a portion of the Adelphi-terrace viewed from Waterloo Bridge. The position of the hotel block, standing, as it does, quite detached from all other buildings, necessitates adequate arrangements for escape in case of fire, and these, no doubt, will be provided, in addition to the security afforded by fireproof floors and stone staircases.

* We gave an elevation of the river front of these buildings, together with plans and a small section, in the *Builder* for October 20, 1888, pp. 285, 286, together with further particulars relating to the scheme.

DESIGN FOR STAIRCASE FOR A LARGE TOWN MANSION.

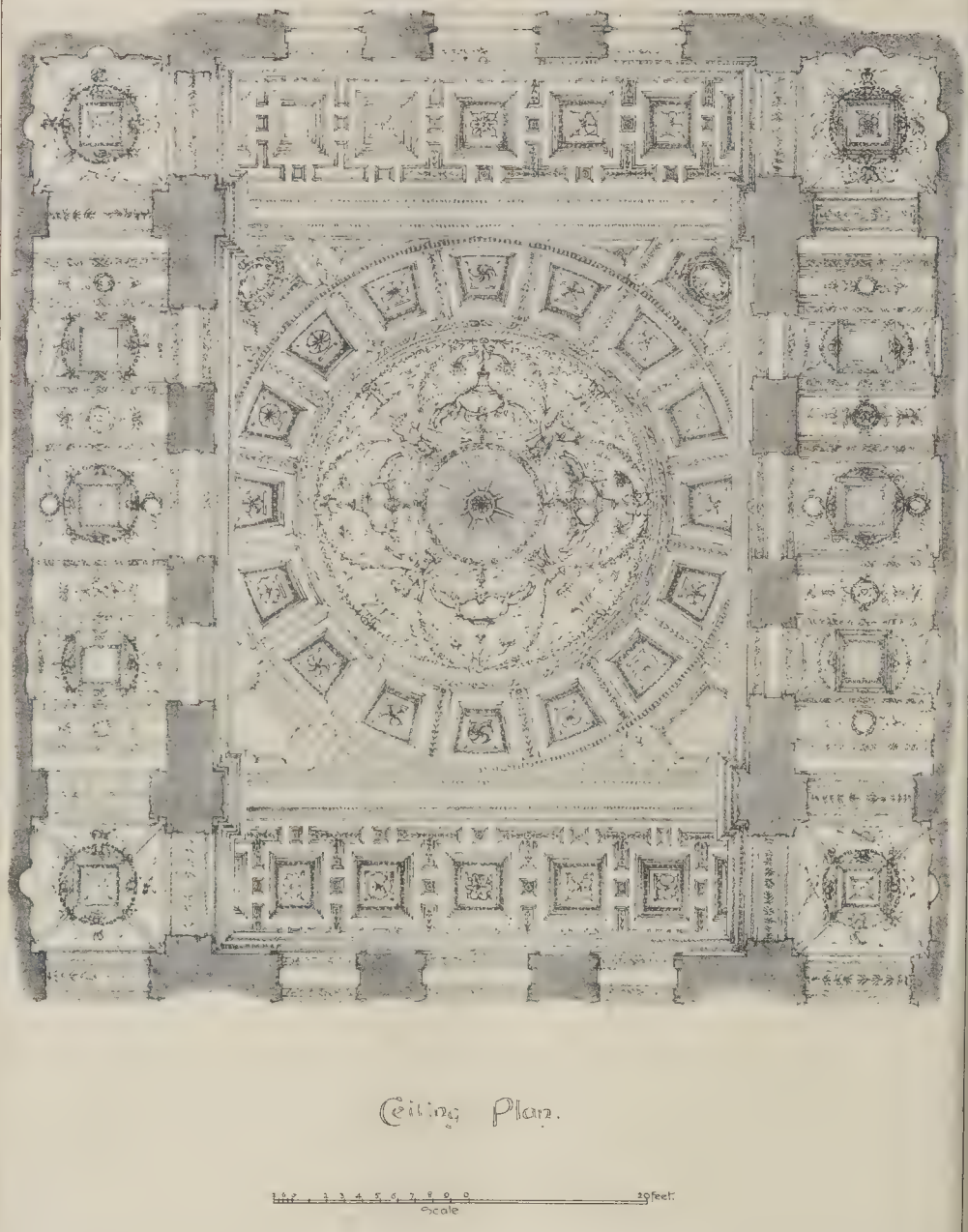
BY MR. A. MACKINTOSH.

CROSS SECTION SHEWING DETAIL.



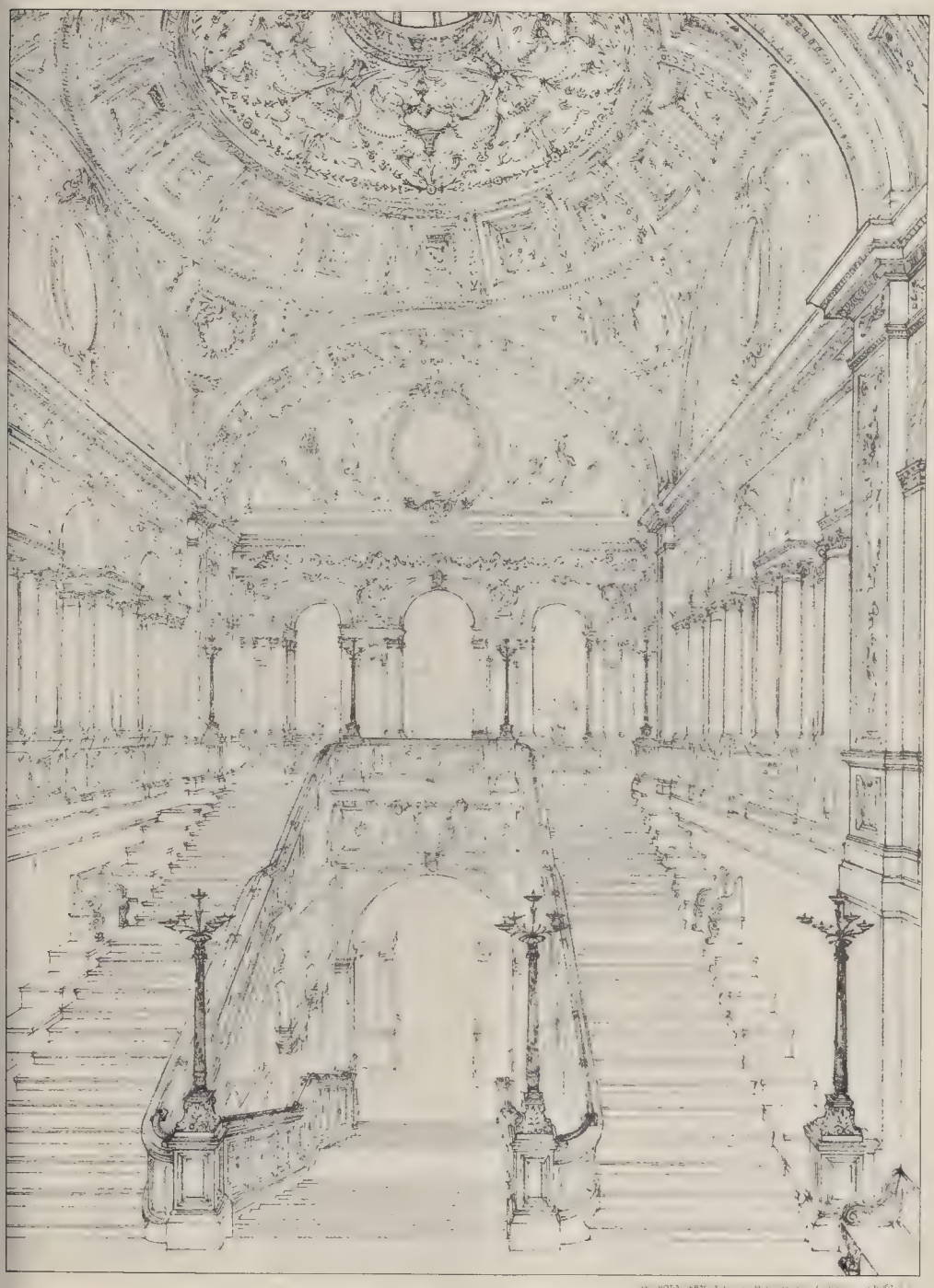


Tite Prize, R.I.B.A., 1891.



DESIGN FOR STAIRCASE FOR A LARGE TOWN MANSION.—By Mr. A. Mackintosh.

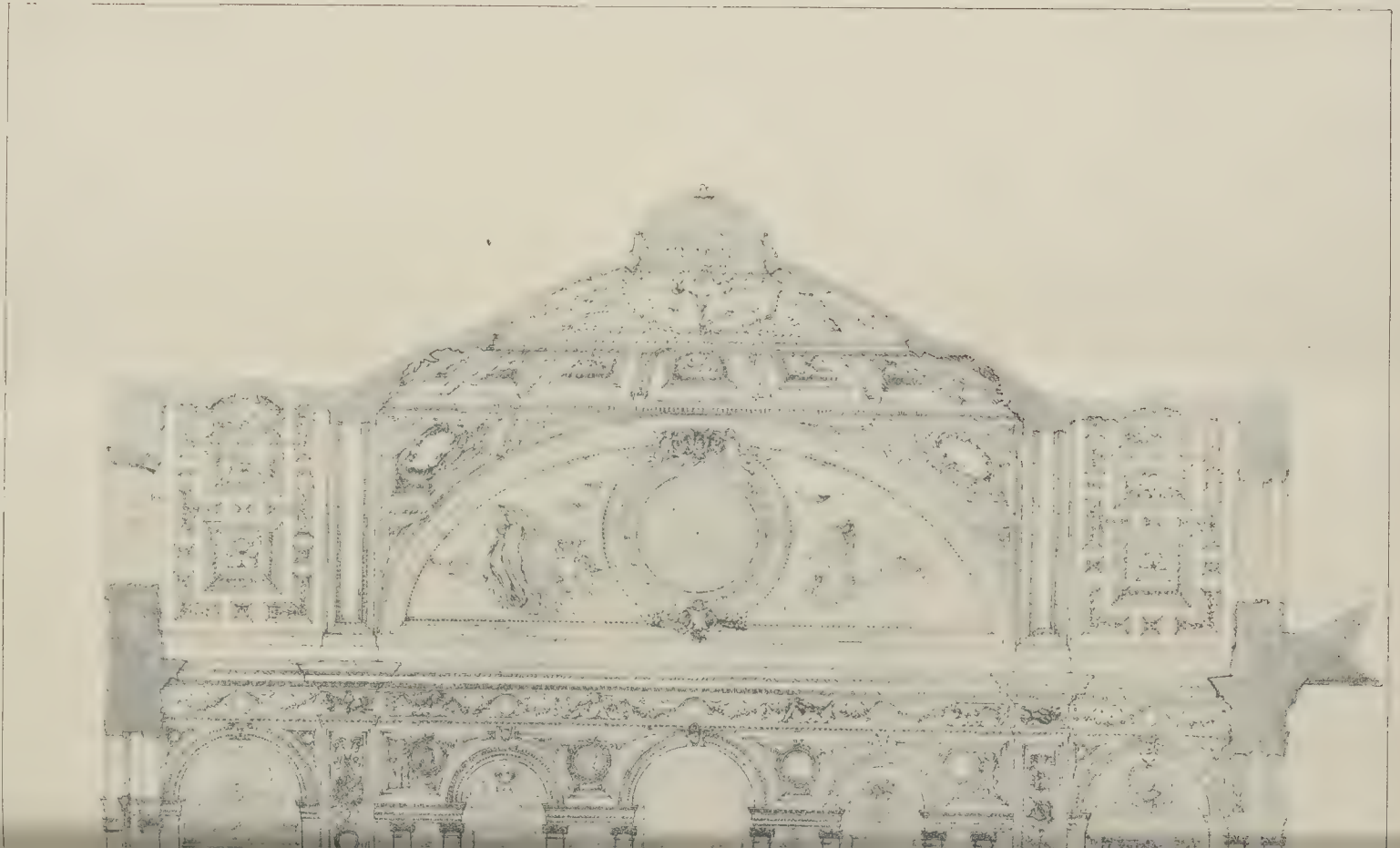
Tite Prize, R.I.B.A., 1891.

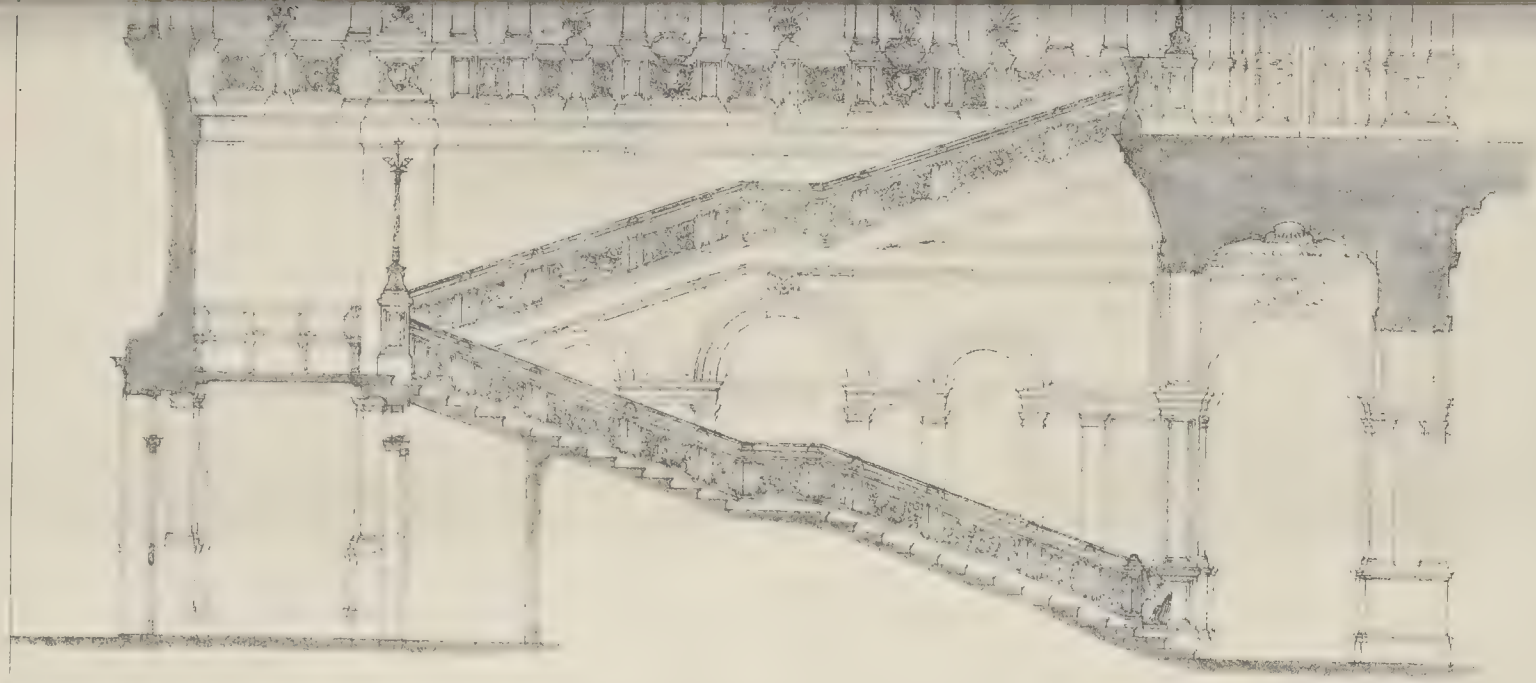


DESIGN FOR STAIRCASE FOR A LARGE TOWN MANSION.—By Mr. A. Mackintosh.

PERSPECTIVE VIEW

Tite Prize, R.I.B.A., 1891





DESIGN FOR STAIRCASE FOR A LARGE TOWN MANSION.

BY MR A. MACKINTOSH

LONGITUDINAL SECTION

feet

Ed. Pugin, R.I.B.A. 1891

Illustrations.

DESIGN FOR A STAIRCASE FOR A TOWN MANSION.

THIS design, by Mr. A. Mackintosh, is the one to which the Tite prize was awarded this year by the Council of the Institute of Architects. We commented on it in a short article on the students' designs in a previous number.

It is only necessary to add here that the figures in the spaces on each side of the circular windows were intended to represent Morning and Spring; Day and Summer; Evening and Autumn; Night and Winter.

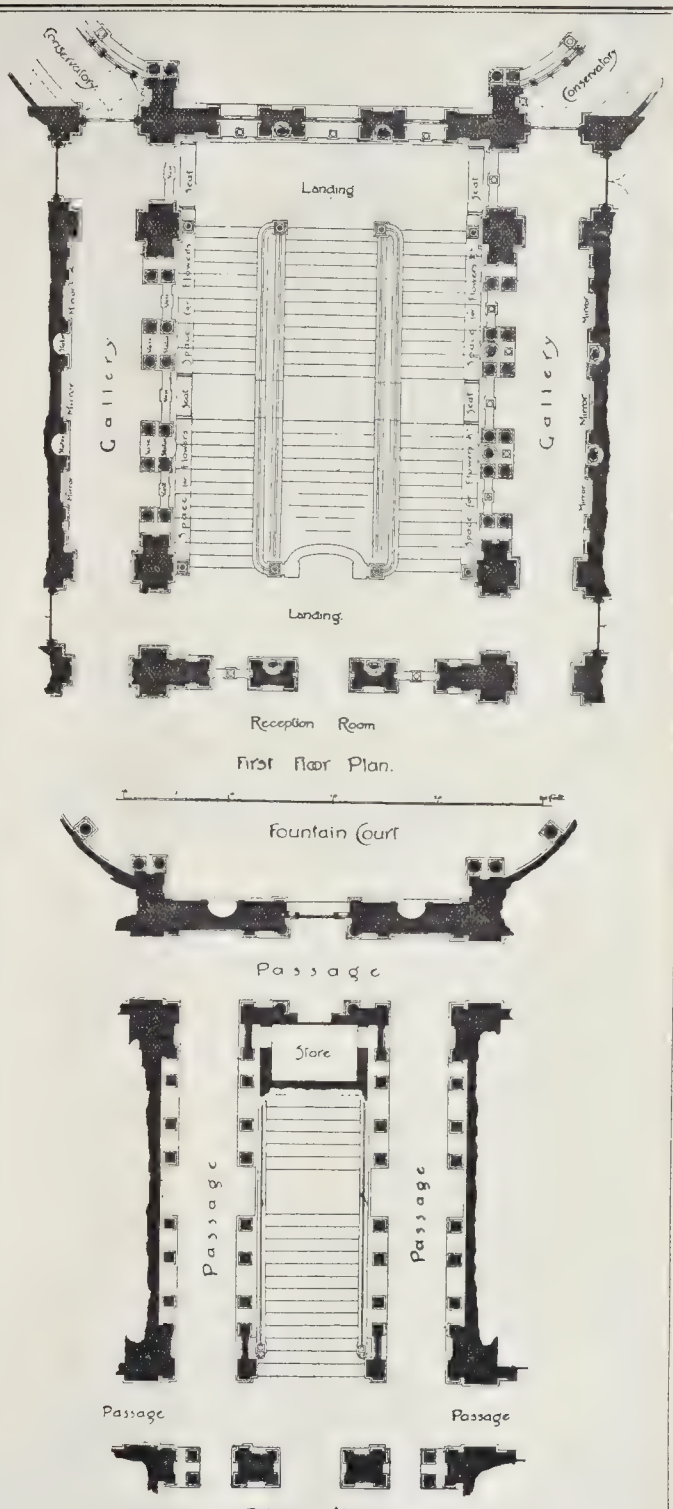
THE IMPERIAL PALACE AT CONSTANTINOPLE.

THIS plan of the ancient Byzantine Palace at Constantinople is introduced as an illustration of Professor Aitchison's Fourth Royal Academy lecture which is printed in this number, and in which the plan is fully described.

LECTURES AT UNIVERSITY COLLEGE.

ON Monday, the 9th inst., Mr. W. St. Chad Boscawen gave the fourth of his lectures, the subject being "Art and Religion." He began by saying that in a mixed civilisation, such as that of Babylonia, it was certain that the varied myths and legends would soon find expression in art. Among our earliest, smallest, and at the same time most important relics, of Babylonian civilisation, were the little cylinder seals. These objects formed a very important class, and corresponded in Babylonian art to the coins and painted vases of classical archæology. The manufacturers of these objects derived their inspiration from the current myths of the people, and we therefore have the earliest illustrations of many of those myths in Greek mythology which had been transmitted to the West through Phœnician and other sources. Mr. Boscawen then proceeded to describe some of the chief myths which were illustrated upon the gems. The principal source was to be found in the epic of Gizdhubar, a work in which the numerous Volklieder of Chaldea had been collected, probably about B.C. 2000. This work was one of the most important storehouses of mythological material; based upon a solar myth, there had been woven into it a large number of legends of much greater antiquity than the epic itself. Among the stories we find almost all the episodes of the labours of Heracles. His struggle with the lion, with the man-bull, the Cretan minotaur, his visit to the garden of the Hesperides, his sickness and wearying from the poisoned garment of Nessus, are all found in this poem. Mr. Boscawen then showed how these legends had come to Greece by two channels, one series by a Phœnician and Cypriote intercourse, the others by the Hittite road through Asia Minor. To the former belong the legends of the Babylonian goddess of love, Ishtar, while by the northern road another series, grouped around the Asiatic warlike mother-goddess, appeared in the West in the tales of Artemis and the Amazon queen, Omphale. The lecturer then gave translations from several inscriptions illustrating these legends, and showed how many of them, which had hitherto been inexplicable by the old canons of Aryan mythology, became perfectly clear in the light of the mythology of Babylonia. One of the most remarkable results of this new material was the clearing up of many of the cycles of Greek and Western Asiatic myths. Mr. Boscawen next showed how new and important a light the discoveries in Babylonia, and the discoveries in the land of the Hittites, threw upon that most important series of legends of the Asiatic mother-goddess. The Ephesian Artemis was but another form of the full-breasted Hittite goddess, whose statue was found at Carchemish, and of the Babylonian Ishtar-Nana, the nursing mother of all nature. The lecture was concluded by a remark that many of the symbols upon the coins of Asia Minor, especially of Ephesus, were replicas of the token marks of the Asiatic goddess.

Prof. Poole, on Thursday, the 12th inst., delivered his third lecture on Greek art. After recapitulating some of the statements he formerly made, he drew special attention to the fact that in the ascendency of Athens (478-404 B.C.) the arts were united, while sculpture ruled painting, and had strong influence over architecture. All the men and women—gods and goddesses—have



Design for a Staircase ("Tite Prize"). Plans.

the same quite impersonal type, and we need the adjuncts we find in them to show us who they are. Phidias had a great hand in the Parthenon,—in the eastern frieze, the frieze of the gods in the centre, and other portions. Vase-painting dates thirty years before sculpture, and coins twenty years later. The epoch of painting extends from 404–330 B.C. During this time painting was predominant. The period from 404 shows a decline in sculpture (which was the work of inhabitants of Greece or the Grecian Islands), and the painters who succeeded seem to have been all Asiatics or from Asia Minor, Ionia, and Mysia, and accustomed to skies more brilliant even than those of Greece. The art of painting was developed at this period to the highest point ever reached before the time of Raphael. We have nothing of this work, except the reflection of it in the relief, by Zeuxis, of a Heraclea, probably in Asia Minor, and feebler workers, are thus traceable. From 404-352 there were no great sculptors. Apelles flourished at the end of this time; he was the favourite painter of Alexander. About 352 Scopas and other four sculptors appeared; and the greatest work of that age is the mausoleum of Halicarnassus. The two main points are the splendid Ionic tomb within, and the magnificent quadriga at the summit. It is plain that there was rivalry in these works, as distinguished from the harmony and consecutive character of the Parthenon. There is here, on the other hand, individuality and great excellence and charm, but very little consecutiveness. Pithis was the author of the statue of Mausolus on the summit, while Scopas is supposed to have erected the side which faced the east. The latter sculptor is by us moderns placed first, although the ancients put him only second. There is one nearly perfect portion of the frieze, and that is, the charioteer, whose expression is wonderful. Prof. Poole then spoke of some peculiarities in the later sculpture,—*e.g.*, the deeply-recessed eyes, as distinguished from the perfectly natural representation of the older works. The stronger lines seem to have been due to the necessity for emphasising peculiarities. The mind is not *rested* by the Mausoleum work as it is by the harmonised work of the Parthenon; it is rather agitated by the variety and peculiarities. Praxiteles, 340 B.C., worked on the temple of Ephesus, of which we have some small remains. In his and other works of the time we discover a wonderful knowledge of anatomy, remarkable for the age. One statue of his (which Prof. Poole said he thought was not sufficiently admired) was that of Demeter or Ceres, which is in the vestibule of the Græco-Roman room in the British Museum. On the face there is intense sympathy, and if we found that face in a Roman Catholic cathedral we should have said it was the finest Madonna ever delineated. But the body is very inferior; and the lecturer suggested, to explain this, the bold hypothesis that the people of Cnidus (like those of Cos), being impoverished, implored Praxiteles to execute, at least, the head, lest the goddess should be angry, while the rest of the work was carried out by another. Prof. Poole pointed out a remarkable peculiarity about the Venus of Milo (250 B.C.), which you think is half-a-head taller than it is because of the increased size of the arms, &c.; while the Venus de Medicis appears, from its prettiness and affectation, less by about 5 in. than it is. When Alexander formed a Court he headed it by a Queen, and the result was that the nobles became monogamous within thirty years, and we have several women in that time possessed of great political excellence and private virtues. The terra-cotta ornaments show the taste of the period, the subjects being chiefly women and girls, while the earlier showed an excess of athletes. Another feature of the later works is the beautiful representation of little children (on the group by Praxiteles, on the other hand, the infant is a blot on the production). Prof. Poole concluded by drawing a parallel between the great sculptors and poets of that age; Æschylus (who was reserved, and had large and simple majesty, like Phidias, nothing distressing about his scenes—even Agamemnon dies off the stage); Sophocles (who takes nature as he sees it, and has infinite pity); and Euripides (who presents a new type, is cynical, and with him women—except in the case of Alcestis—are not raised to their due level). He was the great favourite of the vase-painters. The next lecture will be on the Local Schools of Greek Art.

On Monday last Mr. W. St. Chad Boscawen gave the last of his series of lectures on Babylonian archæology, his special subject being the Rise of the Semites. He said that in previous lectures in this course he had sketched the chief features of the civilisation of the early Babylonian empire, the product in its primitive form of a plodding, inventive Turanian people. It had gone on developing within itself, and with the exception, perhaps, of slight influences from Egyptian sources, it was subject in a very minor degree to foreign influence. It seems to have a curious resemblance to the developments in Egypt under the IVth and VIth dynasties, when Egypt was, indeed, "Egypt for the Egyptians." In the same way there was very little trace of contact by war with any other country except that of Elam. We cannot tell for how many centuries this state had lasted, or how long it would have continued had it not been for the introduction of a new and progressive element. This was to be found in the warm-blooded and keen-minded Semites, who, attracted to the rich pasture-lands of Babylonia and to the markets of the cities, soon saw in the new civilisation with which they were brought in contact much that delighted them. Mr. Boscawen then proceeded to show how the inscriptions revealed much of the early life characteristics of these people. Living a nomad life, restlessly wandering, and engaged in constant tribal wars, they became under Babylonian influence a very powerful factor in propagating this civilisation. The annual tribal movement found its outlet in the annual war which to some extent in Babylonia had been established, but which was a great State institution in Assyria. It was curious to observe how this movement northward was stamped on the Tigro-Euphrates Valley, and that which is the characteristic feature of the life of the tribes of the Shamar and Anezeh of the present day, of moving northward with the heat was found to have existed from the earliest time. These Semitic colonies at Sippara, Assur, Calah, Nineveh, and Horan, form, as it were, so many milestones on the route. Mr. Boscawen then proceeded to describe the great influence the Semites exercised in trades and illustrated it by quotations from several early inscriptions. They simplified the writing in Chaldea as they did in Egypt, and in religion they effected an entire reformation of the Pantheon. They rapidly analysed and adapted, and finally spread abroad, through Northern Mesopotamia, Syria, and Palestine, that which they had learned. It was to this Akkadian and Semitic culture that we owe the marvellous civilisation of Assyria. It was a mixed product. There were many elements in it (indeed, all the ground work) which were Babylonian; but its powerful influence, spreading on the banks of the Tigris to the shores of Greece, was due to the restless wanderings of the Semite. In conclusion, Mr. Boscawen said that to understand the civilisation of Assyria it was necessary, as he trusted he had in some degree succeeded in doing, thoroughly to expound the wonderful development in all branches of the culture of ancient Chaldea. To understand Greek Art, Greek mythology, it was necessary to understand the art, religion, and civilisation of the great colony of the mother country Babylonia. He hoped that this link in the chain would be supplied by a future series of lectures

THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of the London County Council was held on Tuesday last at Spring-gardens, the Chairman (Sir John Lubbock), presiding.

The Blackwall Tunnel.—The Bridges Committee brought up a long report on this project, setting forth the opinions of Sir Benjamin Baker and Mr. Binnie (the Engineer to the Council) as to the feasibility of the scheme, and a number of reasons why, in the opinion of the Committee, this communication, so long promised, should be proceeded with as soon as possible. The Committee recommended:—

"(*a*) That the Committee be authorised to instruct the Engineer to prepare drawings, specifications, and conditions of contract for a tunnel not more than 27 ft. external diameter, and not less than 23 ft internal diameter, provision being made therein for vehicular and pedestrian traffic, and that tenders be invited by public advertisement for the construction of the works

(*b*) That the Committee be authorised to empower the Engineer, in preparing such drawings, specifications, and conditions of contract, to consult Sir B. Baker, K.C.M.G., and Mr. J. H. Greathead, M. Inst. C.E., as may be found desirable.

(*c*) That it is not desirable to proceed with the provisional works of sinking a shaft as authorised by the Council."

Mr. Osborn, Chairman of the Bridges Committee, having moved the adoption of paragraph (*a*),

Mr. Rhodes moved, as an amendment:—

"That, as it appears on high professional authority that in the present stage of engineering science and practice it is not practically possible to construct under air pressure a tunnel at Blackwall of a larger external diameter than 27 feet, or a larger internal diameter than 23 feet; and as it also appears that such dimensions will not satisfactorily and properly afford space for foot passengers in addition to adequate space for two lines of vehicles, it becomes essentially desirable to carefully reconsider the whole question, both in its financial and other relations, and also alternative means of effecting required transfluvial communications of a kind shown by experience to be, probably, easily practicable and comprehensively effective; and that therefore the report be referred back for further consideration."

The amendment was seconded by Mr. Myer, and, after a long discussion, was negatived by 67 votes against to 28 for. The further consideration of the subject was then postponed.

The London Water Question.—The Council next proceeded to consider a special report of the Parliamentary Committee upon the London Water Bills now before Parliament, in so far as it recommended the Council to oppose those Bills. After some discussion it was resolved—

"That a petition be presented to Parliament by the Council in opposition to the Metropolis Water Supply Bill, and that the Council do oppose each of the following Bills, against which they have presented petitions, that is to say—

The London Water Commission Bill.
The Southwark and Vauxhall Water Bill.
The Croydon Water Bill.

and that the costs and expenses of and incidental to the said petitions and the proceedings consequent thereon be charged to and paid out of the County fund."*

After transacting a great deal of other business, the Council adjourned.

ARCHITECTURAL SOCIETIES.

Leeds and Yorkshire Architectural Society.—On the 16th inst., Mr. J. S. Corder, of Ipswich, read a paper on "The Timber-framed Buildings of East Anglia," before the Leeds and Yorkshire Architectural Society. Mr. Corder exhibited a large number of sketches made by himself of some of the best specimens of existing buildings of the kind in the Eastern Counties. Mr. W. H. Thorp, the President of the Society, was in the chair, and a vote of thanks was given to Mr. Corder.

Manchester Architectural Association.—The last ordinary meeting of this association was held at the Manchester Athenæum, on the 17th inst., Mr. T. Chadwick, President, in the chair. A paper was read by Mr. J. A. Gotch, F.R.I.B.A., on "The Renaissance in Northamptonshire," illustrated by numerous views by an oxy-hydrogen lantern. A vote of thanks, proposed by Mr. Stelfox, seconded by Mr. Woodhouse, and supported by the Chairman, was accorded to Mr. Gotch for his paper.

York Architectural Association.—A paper on "Building Legislation" was read on the 12th inst., before the York Architectural Association, in the York Church Institute, by Mr. J. Spencer Yates, Assoc. M.Inst.C.E. Mr. Pollard, the President, occupied the chair. The paper dealt with the many advantages resulting to the inhabitants of cities and towns from efficient building laws providing for more efficient construction and sanitary arrangements of our dwellings. The model by-laws of the Local Government Board were in their general effects criticised. The discussion was taken up by the President, Mr. Monkman, Mr. Penty, Mr. Hepper, and Mr. Pegg, and a vote of thanks was accorded to Mr. Yates for the paper.

Glasgow Architectural Association.—The usual monthly meeting of this Association was held on the 10th inst., the President, Mr. Wm. J. Anderson, in the chair. A paper on "Scottish Baronial" was read by Mr. Charles R. M'Intosh, who prefaced the historical review of the style with a commendation of the claims it has on architectural students as exhibiting standard models of picturesque grouping. To the Scot it should appeal with the added force of national association. Divided into five periods averaging a century each, the typical castles of Scotland were detailed. The essayist showed a series of illustrations of the more important of the buildings instanced.

Dundee Institute of Architecture.—On the 12th inst. a lecture was delivered in the Y.M.C.A. Hall, Dundee, under the auspices of

* We intend shortly to give an analysis of the main provisions of these Bills, and of the London Water (Meter) Bill and the Metropolitan Water Companies' (Charges) Bill.

he Dundee Institute of Architecture, Science, nd Art, by Mr. William Norwell, painter, on 'Decoration in relation to Architecture." Mr. C. Ower, who presided, briefly introduced the ecturer.—Mr. Norwell began by enlarging upon he close relationship between architecture and lecoration, saying that it would be incongruous o speak of them apart. According to the eport in the *Dundee Advertiser* he described he remnants still existing of Greek and Roman lecoration, and alluded to the developments of lecorative work during the Renaissance period nd subsequently. Speaking of the decoration of architecture in Scotland, he mentioned the chapel at Glamis Castle as a fine example of he decorative art of the seventeenth century. In the quaint old Church of Fowlis are some of he most artistic decorations of their kind in Scotland. The ceiling of the great hall in the mansion of Earslhall, at Leuchars, is finely painted. The tower at Collairnie, in Fifeshire, has also decorative inscriptions, and the old Palace of Culross is distinguished for its decorated ceiling and walls painted in *tempera*. The Palace at Falkland still shows on its ceiling fragments of the original painting and gilding. Talking of the decoration of old buildings in Dundee, Mr. Norwell said:—In a building in Rankine's-court, recently removed to make way for an extension of Mr. Keiller's confectionery premises, were discovered in what had been a dining-hall the remains of a decorated ceiling. On the beams were painted inscriptions taken from "Quarles's Emblems," and on the spaces between were flower and fruit subjects in *tempera*. An example of this *tempera* work may be seen in the Dundee Museum—part of a decorated roof taken from a house that stood in the Nethergate, and which belonged to Alexander Wedderburn, at one time Town Clerk of Dundee. The house at the corner of Thorter-row and Nethergate, once the town residence of the Gowrie family, was also elaborately decorated in this way. In concluding his address, Mr. Norwell said that good work must be fairly remunerated. A standard of high excellence would require to be established and recognised. While eye-service should be discouraged on the part of workmen, it was also necessary that the masters should be upright and exemplary. Clients, from a mistaken notion of present gain, sacrificed the stability and finish of their work in a way that no after outlay could put right. Scamped work was not cheap at any price. Frequently he was expected to produce high-class decoration on unworkmanlike productions of other crafts, on surfaces altogether inadequately prepared for high-class treatment. For this he did not blame the members of the other building trades. It was the system that was at fault in these days of cheap and hasty work.

COMPETITIONS.

AYR FREE LIBRARY.—In the competition for the Carnegie Free Library, ten sets of plans were sent in, and those submitted by Messrs. Campbell Douglas & Morrison, of Glasgow, have been placed first. The design of Mr. David Sturrock, Glasgow, was placed second, and that of Messrs. M'Arthy & Watson, Edinburgh, third. Dr. Rowand Anderson, of Edinburgh, acted as professional assessor to the Library Committee.

PETERHEAD FREE LIBRARY.—At a meeting of the Peterhead Town Council, on the 9th inst., a report by the Free Library Committee came up, in which the plan of Mr. M'Millan, Aberdeen, was recommended by nine votes to seven given for the plan of Messrs. Matthews & M'Kenzie, Aberdeen, both being estimated on a basis of 3,000*l*. A discussion took place over a motion by Provost Smith to agree to the purchase of a suitable site at the corner of Queen-street and St. Peter-street at a cost of 1,000*l*., and to adopt Mr. M'Millan's plan. Mr. Gray moved delay for a month. Mr. M'Millan's plan was ultimately approved, and the work was ordered to be gone on with without delay.

NEW CHURCH, LEIGH WOOD, CLIFTON.—We understand that the design submitted by Mr. John Medland, of London, in the competition for a new church at Leigh Wood, Clifton, has been accepted by the Committee.

ST. ANDREW'S CHURCH, EXMOUTH.—We are informed that the committee have awarded the premiums in this competition as follows, viz.:—(1) Messrs. Paul & Cogswell, London, W., and (2) Messrs. Phillips & Holdgate (design No. 2), Newport (Mon.). *Proxime Accessit*, Mr. H. Wilson, London. There were fifty-five designs received. The assessor was Mr. G. H. Fellowes Prynne, A.R.I.B.A.

FREE LECTURES TO ARTISANS AT CARPENTERS' HALL.

PROFESSOR ROBINSON ON "SANITARY AND INSANITARY DWELLINGS."

THE first of the present series of free lectures to artisans and others was delivered on the evening of Wednesday, the 11th inst., at Carpenters' Hall, London-wall, by Prof. H. Robinson, M.Inst.C.E., his subject being "Sanitary and Insanitary Dwellings." The chair was taken by Sir John Coode, K.C.M.G., who briefly introduced the lecturer.

Prof. Robinson said that "Sanitary and Insanitary Dwellings" was a subject which he had the greatest pleasure in lecturing upon, because he had always felt, independently of his professional connexion with sanitary matters, how important it was to struggle against the apathy which existed to such a large extent amongst the public, and to endeavour to give some information which would guide everyone in the simplest arrangements of their houses, upon the healthy condition of which depended the lives of those who were dear to them. Last year in London there were 2,276 deaths from preventible causes,—namely, fever and diphtheria. One important point to observe in choosing the site of a house was that it should be free from damp, and be so situated as to prevent other houses being constructed so as to in any way interfere with the current of pure air around and within it. He emphasised the necessity of having the whole basement of a house erected on wet subsoil concreted to prevent the possibility of the damp rising, remarking that the presence of damp in a house was a fruitful source of disease, and in some cases alone caused diphtheria. The construction of a dry area in addition to a damp course in the wall was also essential. In a great number of very beautiful mansions the construction of windows was not carried out with due regard to the proper admission of the rays of light from heaven. One point, therefore, to bear in mind in building a house was not to exclude the light of the sun. The lecturer proceeded to point out some of the causes of the pollution of the air. One of the ordinary causes, he stated, was the respiration from the human beings occupying the house; others were the non-removal of refuse from the immediate neighbourhood of the house, the existence of old cesspools or old receptacles for filth, which very frequently were permitted to be covered up and hidden during the construction of a house, and the fact of a house being sometimes built upon what was called a "made" soil. He had seen, within five miles of where they were then assembled, low-lying land filled up with all sorts of refuse by those who ought to have been prevented by the authorities. In years afterwards that land was built upon, and, as a matter of fact, was a constant source of pollution to the air immediately surrounding it. The ordinary methods of removing foul air were by having a Tobin tube or opening in the window, and a fireplace. There was a great want of uniformity amongst the building by-laws issued by local authorities. They partially met the points to which he had been referring, but not sufficiently. At the present time a great number of houses were built without provision for fresh air, which was so necessary. He had had occasion during the last twenty years or more to inquire into the causes of a good many outbreaks of disease which he regarded as preventible, and he had become more and more convinced that there was a certain class of people who did not feel any repugnance in building a house improperly, knowing that all the elements of danger to life existed. He always looked upon a jerry-builder as a man whom he would like to hunt out of society. Some years ago he suggested that it would be a good thing for every local authority to keep, and to open to the public a death-chart, or a map indicating by a red or black spot where any fatal case of typhoid or preventible disease had occurred. In the course of a few years such a record would tell its own tale. Besides the purity of the air, one very important point was, to take care about the water supply of a house. Although water when delivered from its source might be free from pollution, it very often became polluted afterwards in various ways. One of the commonest ways was the fact of people allowing their cisterns to be exposed to the air. He exhorted his hearers to see that their cisterns were cleaned and covered up properly, and, in conclusion, pointed out the necessity of having the drains of houses overhauled and tested before they were occupied, and the desirability of having the drains so constructed as to ensure the speedy removal of the fluid refuse.

At the close of his lecture the Professor received a very cordial vote of thanks.

The second lecture of the series was delivered by Professor T. Roger Smith, F.R.I.B.A., on Wednesday evening last. Mr. A. Waterhouse, R.A., P.R.I.B.A., presided, and briefly introduced the Professor, who lectured on the "Failure of Buildings." There was a large audience.

Books.

The Chemistry of Iron and Steel Making. By W. MATTIEU WILLIAMS, F.C.S. London: Chatto & Windus.

THIS treatise may be regarded as intermediate between those usually classed as "popular" and those that are severely technical. Mr. Williams of late years has been better known as the author of popular science articles in the magazines than as a technical writer, but this little work testifies to his considerable knowledge of the subject under consideration. It is a pity that the author has not more thoroughly re-written the various chapters which too often are simply articles and controversial letters taken pretty much as they stand from the various periodicals in which they first saw the light. The result is a somewhat irritating want of coherence. As the work is avowedly one on "The Chemistry of Iron and Steel Making," the reader is apt to feel not a little disappointed at finding himself inveigled into reading somewhat stale controversies and expressions of Mr. Williams' opinions, and at finding more recent matters of interest, such as the Gilchrist and Thomas Basic process for the elimination of phosphorus, and the Bower-Barff process for protecting iron from oxidation, dealt with only in the most superficial and perfunctory manner. Although we confess to a feeling after reading this *omnium gatherum* of Mr. Williams' contributions to the literature of iron and steel making that the author might have done better, we must, in justice, say that much that is treated of is deeply interesting, and written in clear, vigorous, if occasionally dogmatic, language.

The introductory chapter gives an interesting account of various steps that led from the use of stone implements to those probably of native metals like gold and copper. We have seen specimens of native copper in a state of remarkable purity obtained from a remote province in the almost unexplored interior of Brazil. Attention was drawn to the metal by travellers who came across vessels and implements of beaten copper made by the untutored aboriginal natives, and enquiry revealed the existence of numerous "pockets" containing large masses and smaller nodules of metal. This would seem to uphold Mr. Williams's theory that the wide gap between the flint and bronze period was bridged over by a "gold,"—and we may surely add, a "native copper,"—period. Tin and copper ore, found, as they are, side by side in Cornwall may by accidental admixture and fusion in the same fire have originated the valuable alloy, bronze. The bronze period was a long one, owing probably to the great difficulty of obtaining iron from its ores. The early iron-makers naturally selected for their purpose the most metallic looking ore, as well as the one most easily reduced. This they found in magnetic oxide of iron, which could be reduced with charcoal in small furnaces, and which would yield a metal of the character of mild steel. In fact, the earlier samples of ancient iron were probably in most cases of the nature of steel, it being more easy to produce this from the available ores and fuel, than malleable iron.

This use of pure ores and pure fuel enabled the primitive iron-maker to obtain a satisfactory product in a rough and ready manner. The growing scarcity of charcoal fuel and the comparative scarceness of the purer ores of iron led ultimately to attempts to obtain iron by the use of more abundant ores and pit coal. Then the troubles of the iron-maker began. Sulphur was added to the resulting iron, chiefly from the fuel, and phosphorus from the impure ores, and with these two deadly enemies of iron, iron-masters and chemists are still struggling.

The growth of the iron industry is strikingly shown in the fact that in 1788 we produced 61,300 tons, in 1888 7,898,634 tons. There was a slight falling-off in our production for a few years subsequent to 1872, and Mr. Williams suggests one very reasonable explanation—viz., that iron, subject as it is to wear and tear and oxidation, is far from imperishable. Assuming, for example, that the average life of a rail is fifteen years, the millions of tons that were made from 1865 to 1872 must be thrown back as old iron between 1880-7. Ship-plates, boiler-plates, shafts, girders, &c., come back in like manner as old scrap, and, the greater our production at the time of their birth, the greater their competition with new iron after death.

The chapter on the ores of iron is clearly written and very interesting. The red ores, or hæmatites, consisting mainly of sesquioxide of iron ($Fe_2 O_3$), are favourites, owing to their freedom from phosphates. This freedom is due to their geological position. The phosphates, which are so damaging to clay iron-stones, are mostly, if not entirely, due to the remains of vertebrated animals, whose bones contain so much phosphate of lime. The nucleus of many of the clay iron-stone nodules is a fossilised fish. The best hæmatite occurs chiefly in the Cambrian and Silurian rocks, in which are only the remains of invertebrate animals, whose solid framework is carbonate of lime. Mr. Williams sees great possible changes in the future, and while he acknowledges for this country great advantages in the production of finished iron, he ventures the prophecy "that some of us may even live to see the time when pig-iron will be shipped from America to this country as ballast, as wheat is being shipped at present."

In the chapter on fluxing, roasting, and calcination, a good deal of space is devoted to the action of the various fluxes used in soldering. Mr. Williams apparently claims as his own theory in explanation of the action of these substances, one which almost every intelligent man has adopted—viz., that a flux acts not by altering the melting-point of the solder, or even by any direct effect on its fluidity when melted, but its whole efficiency depends on its presenting to the melted solder a pure metallic surface to which it can adhere, or, in fact, alloy itself more or less completely.

A suggestion is made that the so-called slag, or, as Mr. Williams prefers to call it, "cinder," the most unmanageable of all the waste products of British manufactures, might be more used by architects for decorative work where fairly durable imitations of onyx, jasper, and agate would be suitable.

The chemistry of the blast furnace is dealt with in a very readable manner, but want of space prevents a full treatment of so large a subject, and our remarks must be confined to matters that may be regarded as of more immediate interest to our readers.

In connexion with remarks on the temperature of formation of carbonic acid gas and carbonic oxide, Mr. Williams refers to a fact too often ignored by stove-makers and users,—viz., "No carbonic oxide is traceable in cases of slow combustion, such as that of manure heaps, or in the animal body, neither does it show in slowly-burning stoves; but if we make a common unlined shop stove red-hot, there is a noxious escape of carbonic oxide which passes through the red-hot iron, and diffuses before there is time for its combustion in the air to take place. The headache effect of such ill-constructed stoves is due to this,—not to the drying or roasting of the air, as is commonly supposed. Carbonic oxide is an active irritant poison. Carbonic acid is merely non-respirable."

Pig-iron is very happily described as "a mongrel steel, containing too much carbon to be weldable, and too much of the other impurities to be malleable, or have any degree of workable toughness. Its simple merit is fusibility, and hence it may be used for foundry purposes, provided it is not excessively charged with silicon, sulphur, or phosphorus." It seems to be much more difficult to find a definition for steel that will apply to all its varieties. The fallacy of estimating the value of steel by its hardness is pointed out. Hardness is but one quality required; there must also be a special ability to endure smart blows or vibratory shocks. Where tenacity has to be combined with stability, and hardness with toughness, says Mr. Williams, "the best material at present known is made by combining the purest of iron with the purest of carbon, and excluding everything else." This, of course, does not cover those pseudo-steels obtained by the addition of other elements than carbon; these, however, are special productions useful in certain directions, but which may very well be excluded from the class of true steels. The addition of 2·45 per cent. of aluminium, according to a paper read by Mr. W. J. Keep before the Iron and Steel Institute last May, converts re-melted wrought-iron into a steel-like product that welds well and can be cast. Again, armour plates containing rather less than 4 per cent. of nickel have, according to American trials, exhibited great tensile strength, where an all-steel plate was completely cracked by the shot, and the Cammell compound plate may be said to have entirely broken up. It is at once a virtue and a vice in iron that its properties can be so marvellously modified by the addition of often infinitesimal proportions of other elements.

The chapter on the hardening and tempering of steel will well repay perusal. Some of the ancient recipes for fluids to be used in hardening steel are amusing. Good results may be looked for if the fluid used be "the blood of a man xxx years of age and of a sanguine complexion, being of a merrie nature and pleasant." Apart from these historical curiosities, the user of tools will obtain from Mr. Williams's lucid explanations much serviceable information.

Dealing with the all-important question of iron and steel tests, Mr. Williams very rightly insists on the fallacy of relying on mere hardness, or even the power of resisting a gradually and steadily applied tensile strain. We are glad to see a well-merited tribute of praise paid to an excellent little manual, which has long had a place on our shelves,—we refer to the "Management of Steel," by George Ede,—a work that puts to shame many more modern so-called technical manuals, which are often mere specimens of bookmaking by those quite devoid of practical knowledge of the subjects dealt with.

The chapter on "Iron *versus* Steel for Structural Purposes" opens with General Hutchinson's *couleur de rose* report on the ill-fated Tay Bridge which a few months afterwards became a ruin. The chapter is too lengthy and too important to be usefully summarised in a few lines, but it is insisted that for girders and the other supports of bridges which are especially liable to vibratory shocks, mere tenacity under a gradually-applied and steady strain is of little value unless taken in conjunction with other tests in which violent vibrations and sudden shocks are elements. "The theory that localised crystalline structure is produced by vibratory action may sometimes be very convenient for contractors, but," says Mr. Williams, "I doubt whether it has any reliable foundation in fact."

The chapter on the protection of iron from corrosion is a fair *résumé* of the subject. The chief point of novelty is the recommendation of "once run" mineral oil for the removal of rust and the subsequent preservation of choice ornamental ironwork. The device is only applicable, however, to interior ironwork and its efficacy is attributed to the formation of an imperceptible film of the semi-dissolved carbon in the crude oil. As we have already said, the Bower-Barff process is dealt with in a few bald sentences. Considering the widespread interest felt by all interested in iron as a structural material and the great expectations that were not long since expressed as to the future of the process, it would certainly seem that in a work devoted to the chemistry of iron and steel making space might well have been spared for a subject of so much moment, and about which there is so much difference of opinion.

The protection and ornamentation of iron by films of platinum, gold, and silver, obtained by the application of mixtures of essential oils and salts of the metals to the surface of the heated iron, we would suggest might also be described and criticised in any future edition that may be called for.

In conclusion, the book will be found, notwithstanding a few deficiencies, very useful to every intelligent user of iron, and we trust that its success will be such that its author will have an opportunity of imparting to it greater homogeneity, and of treating with greater fulness of detail many of the latest discoveries and applications connected with his subject.

Outlines of Ancient Egyptian History. By Auguste Mariette Bey. Translated and edited, with notes, by M. Brodrick. London: Gilbert & Rivington. 1890.

This compact and handy little volume of 175 pages is a model of what such books should be. The translator's work has been done carefully, and its supervision (as we are told in the preface), "both in manuscript and proof," by Mr. Le Page Renouf, Keeper of the Egyptian and Assyrian Antiquities in the British Museum, is sufficient guarantee of its accuracy.

The book is divided into two parts. Part I. treats briefly of the history of the "dynasties," in which their bewildering chronology and probable historical sequence are intelligibly set forth. Part II., to most people perhaps the more interesting half of the book, is devoted to an account of the principal monuments, arranged in order of time, according to the dynasty under which they are supposed or known to have been erected or wrought. The excellence of this arrangement is obvious.

We notice one grave defect,—viz., the absence of any kind of index. Surely, in a work of this sort we ought to have had, at least, an index of names of persons and places. Let us hope that the book may speedily reach another edition, so that so serious an omission may be supplied.

An Account of the High Altar-Screen in the Cathedral Church of St. Albans. By Henry Hucks Gibbs. St. Albans: Gibbs and Bamforth; 1890.

This is a pamphlet giving a short account of the history, as far as known, of this celebrated screen, of the modern statues, which have been inserted in it, and of its restoration generally, by Mr. Henry Hucks Gibbs, at whose sole expense the screen has been restored. Illustrations are given of the screen as now restored, and of its appearance in the epochs of its previous history. The names of the saints whose figures are inserted are given, with a short account of each. The figures and the new work generally were executed by Mr. Harry Hems. The proceeds of the sale of the book are to go to the Repair Fund of the Abbey.

Correspondence.

To the Editor of The Builder.

ADJOINING OWNERS UNDER METROPOLITAN BUILDING ACT.

Sir,—Referring to the article under this heading, in your issue of the 31st ult., and Mr. H. Chatfeild Clarke's letter in your number of the 7th inst., it would appear that the decisions in the two principal cases cited by you, viz., Hunt *v.* Harris (1865), 34 L.J., C.P., 249, and Fillingham *v.* Wood, L.T.R., year 1890, p. 66; Surveyors' Institution Professional Notes, vol. iv., p. 381, are directly in conflict.

In Hunt *v.* Harris, the plaintiff and defendant were respectively leaseholders for long terms, of adjoining premises, No. 38 and 37, Eastcheap. The party-wall between the premises got out of repair and became dangerous. The Commissioners of Sewers for the City of London, in accordance with sec. 72, served both plaintiff and defendant with notice to repair the wall. Plaintiff, the leaseholder of No. 38, accordingly did the necessary work; defendant, the leaseholder of No. 37, did nothing, and refused to pay to plaintiff any contribution towards the expense, on the ground that he (defendant) was not "owner" within the meaning of the Act, so as to make him liable therefor, as he alleged that he had underleased in parts, to several underlessees, the whole of his premises, No. 37, for terms of seven and a half and twenty-one years, and that therefore they, his underlessees, were the persons liable for payment. On appeal to the Court of Common Pleas, judgment was given for plaintiff, the Court affirming that the defendant was, under the circumstances, the person meant by the Act to be made liable for payment, and not his underseers.

The recent case of Fillingham *v.* Wood, decided by Mr. Justice Chitty, was that of a party-wall, in which the "building owner" on one side gave the usual previous three months' statutory notice to Smith, the leaseholder of the whole of the adjoining premises, and proceeded to do works to the party-wall. It appears that Smith himself occupied a portion of his premises, but had underleased other portions next the party-wall to the plaintiff for a term of three years. Plaintiff now asked for an interim injunction to prevent defendant interfering with the party-wall, on the ground that he (plaintiff) was entitled, as "owner," under the interpretation section of the Act, to three months' notice from defendant, before defendant could be entitled under the Act to interfere with the party-wall. Mr. Justice Chitty held that plaintiff, although only an underlessee for a short term of a portion of the premises only, was an "owner" within the meaning of the Act, and so entitled to notice, and granted the injunction.

In Hunt *v.* Harris the Judges, Earle, C.J.; Byles, J.; and Smith, J., appear to have arrived, by three different roads, to the conclusion that under-lessees of portions of the premises were not "owners." Earle, C.J., said the "owner" meant by the Act is the owner of the structure, viz., a person in possession or receipt of the rents and profits, *i.e.*, a person having a beneficial lease entitled to the rack rent and that the statute contemplated in the "adjoining owner" something in the nature of a permanent interest of the whole of the premises, as appears from section 84 [giving power to adjoining owner to have chimney-stacks, &c., built]. He points out also that by section 74 if "owner" will not pay, the Commissioners have power to sell the structure, and

it would be very inconvenient to think of selling in case of default of a sub-lessee who might have a very short term only.* He says the owner of a long term who has underlet and who is entitled to the rack rents is liable. He may or may not have recourse to his underlessees or to his landlord for contribution, that depends on their contracts. Byles, J., said there is nothing to show that the demises of portions of these premises to the underlessees carries any interest whatever in the party-wall. Lodgings are frequently let on leases for terms of more than a year, and he certainly would be very much astonished to be told that such leases include the demise of portions of the party-wall. (It is well known, however, that some leases of portions of premises do demise portions of the external and party-walls, although it is possible that they do not do so by presumption or inference, but only by express mention thereof. A. & C. H.). He certainly did not find that defendant demised any portion of the party-wall to his sub-lessees, and therefore he, the defendant, was liable. Smith, J. It is difficult to construe the Act definitely. The facts of each case must be narrowly looked at. He thought, in this case, defendant answered the description of "owner" in the Act. Defendant is in immediate possession of the whole of the rents and profits, and therefore the beneficial "owner," and the evidence did not satisfy the court that there are other persons who would answer that description.

In Fillingham *v.* Wood, Mr. Justice Chitty echoes Mr. Justice Smith as to the difficulties of putting a definite construction on this Act of Parliament and the expediency of dealing with each case as it arises, and then proceeds to give judgment for plaintiff on the ground that although he is only underlessee for only a portion of the premises, yet he is an "owner" according to section 3, because his term was greater than that of a "tenant from year to year.'

The Judges appear to have coincided with the observation said to have fallen from the late Lord Chief Justice Cockburn, that "the builders made the Act, and they had better interpret it, for he could not."

The following sections of the Act more particularly refer to the "owners" and their liabilities, viz., section 3 (interpretation) "'*Owner*' shall apply to every person in possession or receipt either of the whole or of any part of the rents or profits of any land or tenement, or in the occupation of such land or tenement other than as a tenant from year to year, or for any less term, or as a tenant at will." Section 97 of Part 4 (Miscellaneous Provisions): "The owner immediately entitled in possession to such premises, shall in the first instance pay such expenses. . . . . If there be more owners than one, every owner shall be liable to contribute to such expenses in proportion to his interest,"—*i.e.*, to pay contribution to the owner who has, in the first instance, paid all the expenses. But it has been held that this does not entitle a lessee to levy contribution from his landlord if he, the lessee, is under express covenant to repair the party-walls.

These, to the lay mind, apparently conflicting decisions do not appear to assist us to the definition of the meaning of "owner" in the Act, more especially as the judges in both cases warn us that we must only very narrowly apply their decisions to other cases. But it should be borne in mind that Hunt *v.* Harris is probably of superior authority, being that of the Court of Common Pleas, presided over by the Lord Chief Justice thereof, whilst Fillingham *v.* Wood is a decision by a single justice of the Chancery Division, and on a prayer for an interim injunction only.

If Hunt *v.* Harris be correct, then, as sub-lessees for more than a year are not "owners" liable to pay, one would reasonably consider that they are not owners entitled to notice; but then Mr. Justice Chitty, in Fillingham *v.* Wood, says they *are* "owners" entitled to notice (their liability to pay not arising in that case).

The general practice with architects has been, as Mr. Chatfeild Clarke correctly states, to serve notices on the under-lessees of parts of adjoining premises, and to receive contribution from them, but if the superior lessee of the whole premises is also entitled to notice, how are to be arranged the differences which may arise? The Act provides for a quasi-arbitration by three surveyors only,—one appointed by the building owner, one by the adjoining owner, and a third surveyor, who is to be appointed by the other two surveyors, and is to act in the event of their disagreement. But, having served a notice on the lessee of the whole premises and on each of the underlessees of each portion, how are we to act if the lessee and his underlessees differ and each appoints his own surveyor? There will be then four surveyors to each portion of the party-wall, an impracticable and illegal number, which, we think, shows that the Act did not contemplate more than one immediate "owner" of any portion of a party-wall, to be dealt with by the building owner.

The only clear line of interpretation we can get from the cases is that the adjoining "owner" must be either the owner in fee, not encumbered with any tenant in possession holding a greater interest than "from year to year, or as tenant at will," or he must be the lessee or underlessee immediately entitled to possession, and to whom the party-wall or a part therefore has been demised.

Personally, we consider this conclusion to be unsound and inconsistent with the general tenour of the Building Act, which ignores actual ownership in party-walls; but where it finds one wall only between two premises occupied by different persons, makes that wall a "party-wall," quite irrespective of whether it is built wholly on the land belonging to the one premises or the other, or partly on the land of one and partly on the land of the other, and gives to the owners of both premises certain rights over the wall, and subjects them both to certain liabilities in respect thereof without regarding whose property the wall might be otherwise.

A. & C. HARSTON.

* The learned Judge did not comment on the difference which existed between the powers of the *Commissioners* (of Sewers of the City of London) and those of building owners, in the recovery of expenses. The Commissioners' powers, as is proper in the case of a public authority, are more extensive than those of a "building owner." (And it must be remembered that this was an action by an owner and not by the Commissioners.) The former by sec. 74, may, in the event of non-payment by the owner, "sell such structure . . and deduct from the proceeds of such sale the . . expenses." The building owner has no such power. Further, sec. 73, "the expenses incurred by the Commissioners in respect of any dangerous structure . . shall be paid by the owner of such structure, but without prejudice to his right to recover the same from any lessee or other person liable to the expenses of repairs." From which it may be inferred that the Commissioners had a wider range of owners to proceed against than have "building owners," leaving the owners so proceeded against, recourse to their lessees or sub-lessees according to the tenour of their respective contracts.—A. & C. H.

PROPOSED NEW CONCERT HALL, LANGHAM-PLACE.

SIR,—In the description of the above building sent you by my friend Mr. Knightley, and published in your last issue, he has forgotten to mention that the designs were prepared in 1887 for a proposed Company by Mr. Knightley and myself as joint architects—Mr. Knightley taking the elevations and I the plans and internal arrangements and the negotiations with the late Metropolitan Board, who gave their sanction to the plans. The drawings, with the exception of the elevations, were all made in my office, the plan on street-level, which you publish, being a facsimile of one of them. The Company never went to allotment, though it is still in existence, and under a private arrangement as to fees between me and Mr. Knightley made in September last (as a personal client of his was going to erect the building), I was "to retire from all active interference in the building of the hall;" but none the less the building will be the joint design of Mr. Knightley and yours obediently,

CHARLES J. PHIPPS, F.S.A.

The Student's Column.

VENTILATION AND WARMING.—VII.

FORMULÆ FOR CALCULATIONS.

THE formulæ which are used for calculating the various problems that have to be solved in the determination of the proper size of openings and channels, and of the extent of the motive power to be supplied in order to plan a system of ventilation to fulfil a definite purpose, are based upon the laws which regulate the movement of fluids in general.

As the method of arriving at our specific formulæ is instructive, we will proceed to investigate the general case.

In Fig. 1 we have a channel A B′ communicating with a larger channel B C, and we will consider the movement of the fluid, with which these are filled, in the direction of the arrows.

We will assume that the temperature of the fluid in the two channels is different, that in B C being higher than that in A B′, so that the specific weight of fluid in A B′ is greater than that in B C, and that the different specific weights per unit of volume are r_1 and r_2. The sectional areas of the channels we will denote s_1 and s_2, their length h_1 and h_2 respectively. If the channels stand vertically, the volume of fluid in A B′ acts with its full weight $h_1 r_1 s_1$ by the force of gravity, to produce movement in the direction of B C. But if the channels are in a sloping situation, the force exercised in producing movement is less. We will therefore consider the channels to be horizontal, and assume a concentrated force R_1 to be acting at the point A, operating equally on the mass A B′. Therefore we assume that the force R_1 amounts to m times the weight of the mass $h_1 r_1 s_1$. Thus we have (1) . . . . $R_1 = m h_1 r_1 s_1$.

Similarly, for the motive force acting on B C, we have—

(2) . . . . $R' = m h_2 r_2 s_2$.

To maintain the motion there must be acting in accordance with hydrostatical laws on each unit of the section a force of $\frac{R'}{s_2} = m h_2 r_2$. Accordingly, on the section s_1 of A B′ must be acting a force at B′ or A of $R_2 = \frac{R'}{s_1} s_1 = m h_2 r_2 s_1$

We have, therefore, acting at A, an united force of

(3) . . . . $R_1 + R_2 = m h_1 r_1 s_1 + m h_2 r_2 s_1 = m (h_1 r_1 + h_2 r_2) s_1$

And, accordingly, for the value of m we have

(4) . . . . $m = \frac{R_1 + R_2}{s_1 (h_1 r_1 + h_2 r_2)}$

where $R_1 + R_2$ denotes the motive force operating on the moving weight.

If we consider in the whole mass from A to C a moving stream whose section is unity, and take Q to be the weight of fluid set in motion in an unit of section, and of the weight producing motion in the same unit, we have $r_1 h_1 + r_2 h_2 =$ Q and $\frac{R_1 + R_2}{s_1} = q$, that is $R_1 + R_2 = q s_1$, and substituting these in (4) we have

(5) . . . $m = \frac{q s_1}{s_1 Q} = \frac{q}{Q} = \frac{\text{moving weight per sq. unit.}}{\text{moved weight per sq. unit.}}$

The determination of the factor m is, therefore, independent of the positive sections of the various channels, but is rather a function of the length of the channels and the specific weight of the fluid.

To investigate the question of velocity with an accelerating force g^1 per second, and an initial velocity of c per second, we have for the—

Velocity at end of 1st second $c + g^1$
" " 2nd " $c + 2g^1$
" " t " $v = c + t g^1$

Therefore (6) $g^1 t = v - c$, $\frac{g^1 t}{2} = \frac{v - c}{2}$ and

$$(7) \quad t = \frac{v - c}{g^1}$$

The mean velocity is $c + \frac{g^1 t}{2}$ therefore the length $H = \left(c + \frac{g^1 t}{2}\right) t$.

By substitution from (6)

$$H = \left(c + \frac{v - c}{2}\right)\left(\frac{v - c}{g^1}\right) = \left(\frac{2c + v}{2}\right)\left(\frac{v - c}{g^1}\right)$$

and $2 g H = (c + v)(v - c) = v^2 - c^2$,
therefore $v^2 = c^2 + 2 g^1 H$.

If we take $g^1 = m g$, that is m times the accelerating force acting per unit of length, then from (5)

$$g^1 = g \frac{q}{Q} \text{ and hence follows}$$

$$(8) \quad v^2 = c^2 + 2 g \frac{q}{Q} H.$$

If we now consider A B in figure 2 as a part of a channel with an uniform section s then the flow therein will, in accordance with experience, have an uniform velocity v if moving freely without hindrance. If r denotes the weight of a cubic unit, we have for the acting force $H s r v^2$.

If we consider the flow to be going on at very small intervals of time, and that in this manner a part equal to $\frac{1}{n} H \times s r$ arrives at the outlet B, the remaining acting force becomes

$$(9) \quad H s r v^2 - \frac{1}{n} H s r v^2 = H s r \left(v^2 - \frac{1}{n} v^2\right).$$

This part $\frac{1}{n} H s r$ is restored by a similar amount of inflow at A. In the first moment, the velocity which the remaining volume retains is reduced to v_1, because the moving force must be distributed also over the newly-imported portion of the flow. The acting force of the present whole mass in the length A B will therefore be: $H s r v_1^2$ but if we assume n so large, and the part $\frac{1}{n} H$ so small, that the outflow becomes continuous, then no loss of the acting force results, and the equation (9) holds good.

Hence $H s r \left(v^2 - \frac{1}{n} v^2\right) = H s r v_1^2$ from which

$$(10) \quad \ldots v^2 = v_1^2 - \frac{1}{n} v^2 = v^2 \left(1 - \frac{1}{n}\right).$$

The velocity of movement in any part of the channel $\frac{1}{n} H$ can be calculated from (8).

As the final velocity must, in accordance

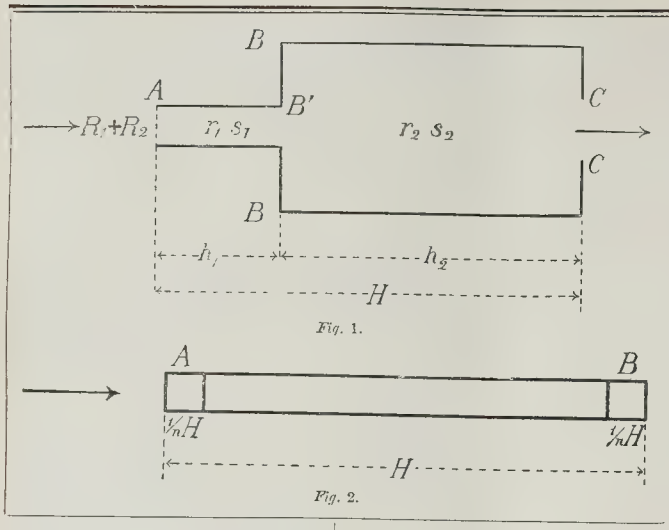


Fig. 1.

Fig. 2.

with the above investigation, attain the original velocity v, we have $v^2=v_1^2+2g\frac{q}{Q}\frac{1}{n}H$, and by substitution from (10) there follows—

(11)... $v^2=v^2-\frac{1}{n}v^2+2g\frac{q}{Q}\frac{1}{n}H$, from which results—

(12)... $v=\sqrt{2g\frac{q}{Q}H}$.

By taking the interval of flow at a length $\frac{H}{n}$ we should have a velocity according to (10) & (11) from the beginning of one interval to its end increasing from $v_1=v\sqrt{1-\frac{1}{n}}$ to v, and at the transition to the next interval returning immediately from v to $v\sqrt{1-\frac{1}{n}}$.

If $n=\infty$, $\frac{H}{n}=0$, that is if the intervals are infinitely small, the limiting velocities are v and $v_1=v\sqrt{1-\frac{1}{\infty}}=v$. The movement is then continuous, and the constant velocity is equal to v, that is, equal to $\sqrt{2g\frac{q}{Q}H}$.

We can now proceed to apply this to the case of motion produced in fluids by reason of a difference of temperature.

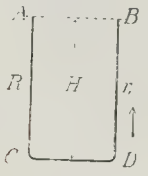


Fig. 3.

In fig. 3 let us assume A C and B D to be columns of water of equal sectional area and equal height, connected by the continuation of the same pipe C D, but of different temperatures, that of B D being the higher. Then the weight of the column A C is greater than that of B D, and as the atmospheric pressure at A and B is the same, movement results in the direction of the lesser resistance, that is, towards B.

The force tending to produce motion is, taking the sectional area of the columns as $=1$, $HR-Hr=H(R-r)$, where H is the height of the column and R and r the respective specific weights. If we now suppose the column B D separated, the motive force is acting at D, and the weight moved is Hr. The length $=H$. Our general formula (12) gives us, therefore, for the velocity

(13) $v=\sqrt{2g\frac{H(R-r)}{Hr}H}=\sqrt{2gH\frac{R-r}{r}}$

and the amount of outflow per second is, when s = the smallest section of the whole arrangement

(14) $vs=s\sqrt{2gH\frac{R-r}{r}}$

Similarly it is evident that if the column BD were of varying temperatures, and therefore of varying specific weights, r_1, r_2, r_3, &c., then, if r is the mean specific weight, our formula (13) holds good. Again, if the column A C be similarly considered, and R be its mean specific weight, the formula also holds; and we may therefore consider it generally true where R and r are the mean specific weights of the respective columns.

We have, for convenience, assumed the fluid to be water, but as we now see that the movement wholly depends upon difference of specific weight in the columns, our results will hold good for any fluid, and therefore for air.

OBITUARY.

The late Baron von Hansen.—We regret to have to record the death of this eminent architect, who was one of the most prominent representatives in Europe of the old school of Classic architects. He was seventy-eight years of age at the time of his death. Von Hansen was created a Baron by the Austrian Emperor, in recognition of the services he had performed in the beautifying of the capital, which owed to him some of its finest special buildings, and also to a great extent the public improvement carried out in the formation of the Ringstrasse. Baron von Hansen was an Honorary Corresponding member of the Royal Institute of British Architects, from whom he received also in 1858 the Royal Gold Medal, when the President, Mr. Waterhouse, spoke in high terms of admiration of his works.

A good many of Hansen's buildings have been illustrated from time to time in our columns; we may refer to the Houses of Parliament, Vienna (December 29, 1877); the great hall of the Vienna Exchange (November 23, 1878); the Academy of Plastic Arts, Vienna (April 1, 1876); and the Academy of Science at Athens (January 5, 1884). The Houses of Parliament at Vienna is one of the finest modern works in Greek style; formal no doubt from the point of view of those who look to picturesqueness as the main element in architecture, but exceedingly dignified in effect and grouping; and as to style, Vienna is nearer to Greece than England, and a style which is certainly unsuitable here may be better accepted there, in point of suitability to climatic conditions, &c. The qualities of dignity and breadth of treatment which are so prominent in the Houses of Parliament are equally to be seen in the Academy of the Plastic Arts, with its lofty plain basement (occupying about half the height of the building) and the elegant effect of the small columnar orders in the upper stories, contrasting with the expanse of plain wall at the base. The particular form of architecture which Hansen followed has perhaps had its day, as a style for modern use; but the high artistic merit of its treatment at his hands must always be recognised.

Recent Legislation as to Buildings and Streets in London.—A paper on this subject was read by Mr. A. A. Hudson, Associate, at the meeting of the Surveyors' Institution held on Monday evening last.

GENERAL BUILDING NEWS.

Restoration of Canterbury Cathedral.—The work of restoration to be carried out at Canterbury Cathedral comprises a new roof over the cloisters, and a concrete bottom to the floor of the triforium. The front of the cathedral, near the north Norman tower, is being restored, and when this is completed steps will be taken to arrest the decay of the south front, restored in Dean Alford's time, which is mouldering away from the softness of the Caen stone then used. The works, which will be spread over several years, are being designed and carried out in accordance with the advice of Mr. Ewan Christian.

Restoration of Selby Abbey.—A part of the work in connexion with the restoration of Selby Abbey has just been completed. Some time since the Restoration Committee received an offer from Mr. Thomas Holdsworth, of Clay Cross, Derbyshire, a former resident of Selby, to undertake the cost of the restoration of the sacristy. This offer having been accepted, a plan was drawn up by the architect, Mr. J. Oldrid Scott. This included the laying of a marble pavement in two colours, red and white, in alternate squares; the restoration of the carved stonework, the greater portion of which had been removed to other parts of the church; and the cleaning and repairing of the oak screen and altar-rails.

Dunblane Cathedral Restoration.—The nave of this building, which has stood without a roof for 300 years, has now got a new roof put on. The large Gothic windows have also all been glazed, including the great west window in the western gable. The choir, which has served for centuries as the Established Church, has had its roof stripped off, and a new one is to be put on to harmonise with the new roof of the nave.—*Scotsman.*

New Congregational Church, Coventry.—The new church in Warwick-row, Coventry, has just been completed. The frontage is a modification of the Italian style of architecture. In the centre is the main entrance, surmounted by a semi-circular stone arch. On each side is a separate front entrance to the galleries. There are six windows in front, which, like the main entrance and gallery doors, have semicircular arches. Above the entrance is a balcony. The main doorway gives access to a porch, from which folding doors on either side open into small lobbies, and these again by other folding doors into the chapel. The chapel is 73 ft. long and 45 ft. wide, with an apsidal recess at the end opposite the entrance, cut off by a light stone screen, supported by two marble pillars. The pulpit is supported by a short stone pedestal, and is constructed of mahogany, with ebonised mouldings and pitch pine panels into which perforated gilt ironwork is fitted. The whole of the seats are of pitch pine. The galleries are supported by iron pillars. The windows have lead lights, with cathedral tinted glass. Around the walls there is a wainscoting of pitch pine. The ceiling has a curved surface, relieved by an ornamental border. Tobin's ventilators are used, and the building is heated throughout with hot water, the boiler for which is in the basement in the rear of the chapel. Communicating with it are the minister's and deacon's vestries, &c. Beyond these vestries the schools are situated. The main room is 50 ft. long by 28 ft. At the extreme rear of the building is the infants' school, fitted with gallery seats. Over the vestries is a lecture-hall. The schools and all the other parts of the premises communicate by passages with the chapel. Messrs. G. & I. Steane, of Coventry, were the architects. Mr. C. G. Hill, of Coventry, was the contractor. The heating apparatus was commenced by the Eagle Iron Works Company, and finished by Messrs. Matterson, Huxley, & Watson.

Tower of Ashbourne Church.—We hear that the tower and spire of Ashbourne Church, Derbyshire, are about to be restored. The spire is over 200 ft. high. The work has been entrusted to Mr. Alfred Hill, of Tideswell.

Dedication of St. Augustine's Church, Addle stone.—The Church of St. Augustine, Addlestone, Surrey, has just been dedicated by the Bishop of Guildford. It has been erected on a piece of land which was given by the Ecclesiastical Commissioners, and which adjoins the Weybridge-road. It is a corrugated iron building, consisting of nave and chancel, with a vestry at the south of the eastern extremity of the nave. Internally the woodwork which lines the walls is painted grey. The chancel has a raised floor. It is separated from the nave by a carved and gabled screen. There is a carved panelled reredos, and the pulpit and lectern are of stained and polished pine, as is also the screen. The building is heated by stoves. The total cost of the whole work was 500*l.* The church was erected by Messrs. Jones & Willis, of London, but a local paper states that much of the designing for the interior was the work of, or was suggested by, the vicar.

Re-opening of Loxley Chapel, near Sheffield.—This chapel has just been restored and renovated. The gallery has been strengthened by new ornamental metal columns, and re-pewed with seats. The body of the chapel also has been re-pewed with seats of pitch pine. A new gallery has been erected at the east end for the new organ.

The old pulpit, which has been restored, is brought forward in front of this gallery, and is surrounded by communion-rails. Two new vestries and two class-rooms have also been provided. The door on the south side has been replaced by a window. At the west end two new porches have been erected of pitch pine. New staircases giving access to the gallery at both the east and west ends of the building have been put up. The heating apparatus, which was supplied by Messrs. Newton, Chambers, & Co., has been fixed to warm both the chapel and the schoolroom. The contractors are Mr. James Fox, of Bradfield, and Mr. Jonathan Marsh, of Stannington. Mr. G. A. Wild was the architect. The estimated cost is 1,200*l.*

COMPLETION OF ST. JOHN'S CHURCH, BURNLEY.—The church of St. John the Baptist, Burnley, is now undergoing alteration and enlargement. The nave is to be extended by two bays, giving an additional accommodation for about 100 people. A tower is also to be erected, the height being 105 ft. The ground floor of the tower will be used as a choir vestry, and there will be a porch at the south entrance to the church. The architects are Messrs. Waddington & Son, of Burnley. The estimated cost of the alteration is about 4,000*l.*

REBUILDING OF DUNCOMBE HOUSE, HELMSLEY.—On the 17th inst. the Earl of Feversham laid the foundation-stone of a new mansion at Helmsley, Yorkshire, which is to replace the one destroyed by fire twelve years ago. The new residence will occupy the same ground as that on which its predecessor stood, and the original style of architecture, English Renaissance Classic, will be reproduced. The plans have been prepared from designs by Mr. William Young, of London, and the contract for the execution of the work has been entrusted to Messrs. W. & J. Kirkwood, of Edinburgh. The floor above the basement will be mainly occupied by the grand hall and a saloon. The hall, which will be entered from the west side, is to be 40 ft. square and about 38 ft. in height, and will be finished with stone dressings, fluted columns with Corinthian capitals. The saloon will be entered from the hall, and this apartment will be 90 ft. by 25 ft. A dining-room will occupy the north-east corner of the block, and on the basement there will also be a suite of apartments. The floor above will be approached from the hall by two staircases, the one of oak and the other of stone. On this floor the plans provide for the construction of a dozen bedrooms, and there will be a chapel 35 ft. by 24 ft. at the north-west corner. On the attic floor there will be fifteen more bedrooms and other appointments. The servants' quarters are in the wings, which were uninjured by the fire, but provision is to be made in the new building for the housekeeper and butler. The floors are to be of fireproof construction, and the building will be heated by hot-water pipes, Haydn's system being that adopted, and hydrants will be placed on every floor. The mansion will be built of freestone from the Bilsdale and Farndale quarries. The estimated cost is a little over 30,000*l.*

BARROW CHEMICAL WORKS.—The estimate of Messrs. W. A. Peters & Sons, Townhead, Rochdale, amounting to 7,700*l.*, has been accepted for the construction of the new Machine-house and Salle, for the Barrow Chemical and Wood Pulp Works, Barrow-in-Furness. The architects are Messrs. Maxwell & Tuke, of Manchester.

FOREIGN AND COLONIAL.

FRANCE.—It is proposed that the profits arising from the exhibition of Meissonier's works, to be organised by the École des Beaux-Arts, should be devoted to the erection of a statue to his memory in one of the public places of Paris. The Municipal Council of Lyons intends also to place a tablet to mark the house in which he was born. The house is situated in the Rue de Thou, near the Place Croix-Pâquet.——The French Government has conferred the title of Chevalier of the Legion of Honour on the German painter Charles de Uhde, whose picture of Christ inviting children to come to Him, treated in an entirely modern spirit, attracted much admiration at the Champ de Mars Salon.——The death is announced, at Cosne, of the painter Dumont.——The Art Club of Rotterdam, which has for some years held in that city exhibitions of the works of French artists, proposes to get up in Paris an exhibition of the works of Dutch artists. Probably the Ville de Paris Pavilion will be put at their disposal for this purpose.——The "Société Philanthropique" of Paris will open in the month of May an exhibition illustrating the art of the early part of the nineteenth century, in a gallery in the Palace des Beaux-Arts; including not only pictures and statues, but also furniture and costumes of the period.——The large foot-bridge which, during the 1889 Exhibition, served to connect the galleries of the Quai d'Orsay, opposite the Pont d'Alma, has been purchased for 35,000 francs by the Compagnie du Nord and the town of Calais, and it now unites the two parts of the new railway-station at Calais. It has been tested up to a load of 114,000 kilogrammes without deflection, though it was licensed for 46,000 kilogrammes only.——The new theatre at Mayenne, of which M. Hélain is the architect, has just been opened.——The new Hôtel des Étudiants at Montpellier, designed by M. Carlier, has just been opened. The great hall is decorated with large mural paintings by MM. Ernest Michel, Marsal, Leenhardt, and Privat. Another artist, M. Cayla, of Montpellier, has decorated the Salle des Jeux with some fine landscapes.——M. Grébaut, director of the French Archæological School at Cairo, has discovered at Thebes no fewer than 240 sarcophagi of the priests of Ammon, some large statues of Osiris, Isis, and Nephtis, 100 papyri and a great number of statuettes. This discovery was made near the place where M. Maspéro discovered, in 1881, the Royal mummies of several dynasties.——Three more antique busts have been discovered in the course of the excavations at Martres-Tolosane.——M. Colibert, the architect who made the restoration of the Rue St. Antoine and the Bastille for the 1889 Exhibition, has left for America, with the object of designing for the Chicago Exhibition some restorations of portions of American cities as they appeared in the 15th 16th 17th and 18th centuries.——The death is announced, at Versailles, of a very talented engineer, M. Adolphe Wenger, who was formerly attached to the Paris, Lyons, and Mediterranean Railway Company. He was the inventor of the form of continuous brake adopted by the Orleans Railway Company, and on some of the Russian railways.——It is considered tolerably certain that the vacancy in the Institute, left by the death of Baron Haussmann, will be filled by M. Alphand.——The Committee of the "Association Amicale des Architectes Diplômés par le Gouvernement" has elected the following officers for the year 1891:—President, M. Marcel Deslignières; Vice-President, M. Paul Wallon; Assistant-Secretary, M. Léon Destors; Treasurer, M. Davoust; Members of Council, MM. Yosso, Gautier, Leclerc, Mayeux, Michelin, Chancel, Dupuis, Gagey, Bonnier, G. Hénard, Poupinel, and Redon.——The three ceilings commissioned from M. Henri Levy, for the Mairie of the Sixth Arrondissement, have just been fixed in position. They are circular paintings, forming allegorical representations of the three-fold Republican motto: Liberty, Equality, Fraternity.

BERLIN.—The Committee of the International Art Exhibition has published an official notice to the effect that it has been decided to give the Architectural Division a prominent position by itself, and we hear that room will be found for the exhibits in the spacious and well-lighted "Machinery Hall" of the Exhibition buildings. The new Berlin Architectural Society, Vereinigung Berliner Architekten, is to have the management of the Architectural Division, and has been asked to elect a hanging committee under the presidency of Professor F. Wolff, of the Royal Technical College.——The Emperor, whilst dining with the French Ambassador, M. Herbette, last week, expressed the hope that France would be well represented at the May Exhibition, and that "Chauvinism" would be forgotten in matters concerning art. He set a good example with his letter of condolence to the Paris Academy on the occasion of the death of Meissonier. A letter from the French Ambassador to the Managing Committee of the Exhibition, which has now been published, shows that the matter has been recommended to the attention of the Paris artists, and that the Emperor's hope is likely to be realised, although the Paris Salon and Moscow Art Exhibition will be on at the same time.——At the older of the two architectural societies, Architekten Verein zu Berlin (in which faces have greatly changed since the formation of the rival institution) an election of officers has taken place. The places of the retiring President and Vice-President (Messrs. Wiebe and Schwechten) have been filled by Geh. O. Brths Voigtel and Jungnickel, and in the Committee we see the names of Messrs. Blankenstein, Eggert, Goering, Hagen, Hossfeld, Jacobsthal, Kellert, Sarragin, and Wallot. The new régime intends dividing the members into two distinct groups: (1) for architectural art and archæology; and (2) for construction and civil engineering.——The Prussian Royal Academy intends giving away a travelling studentship of the value of 150*l.* a year for two years, together with an extra sum of 30*l.* for travelling expenses proper. Competitors must be under 32 years of age. The conditions require candidates not only to give proofs of former study in the form of sets of drawings, but also require them to work out a design for a given subject in six months' time, and to work out a small sketch design before the examining body.——In the "Kunstgewerbe Museum," where the model of Professor J. C. Raschdorff's new Cathedral design can be seen, models of buildings in the vicinity of this proposed erection have now been placed in position. The effect of the different buildings, such as the royal castle, the old museum, &c., in comparison to the proposed Cathedral is unsatisfactory, the Cathedral entirely "killing" its neighbours.——"Die Allgemeine Electricitats - Gesellschaft," in whose hands the electric-lighting of a greater part of the city now lies, has to supply current for 120,000 incandescent and 6,000 arc lights this year. Subscribers pay a third of a penny per hour for an incandescent light, the fee charged for keeping a single light in order is 5s. per annum, and the rent for the "meter" 40s. per annum.

MISCELLANEOUS.

BUDAPEST.—By order of the Hungarian Ministry of Commerce, an Exhibition of Products, Machines, and Implements connected with the various clay; stone, cement, and asphalt industries, will be held, under the management of the directors of the Commercial Museum at Budapest, in the Exhibition Buildings, in the Stadtwaeldchen, from May 15 to June 30, 1891. Foreigners are invited to exhibit all kinds of labour-saving machines, implements, and appliances connected with the above industries, and also articles of the said industries, manufactured in foreign countries, provided they are not yet produced in Hungary. Further particulars may be obtained through the Austro-Hungarian Consulate, 11, Queen Victoria-street.

MR. BALDWIN LATHAM ON THE BENARES DRAINAGE.—Mr. Baldwin Latham, the sanitary expert, has completed his inquiries with reference to the Benares drainage schemes, and laid his views before the Municipal Commissioners on Monday last. With regard to the question disposing of the sewage in the Ganges, he said the objections to this course were purely sentimental—that danger to public health could only occur for a short distance below the outfall. He nevertheless strongly recommended the Board to bring themselves into accord with public feeling on the subject in England, and dispose of the sewage on land. If this course were adopted, he advised the Board to acquire 1,000 acres of land for a sewage farm, and retain the management in their own hands. In considering the cost of the disposal of the sewage on land, he said that, exclusive of expenses for cultivation, it would cost not more than Rs 23 to Rs 33 an acre; and the question the Board had to consider was what portion of the expenditure would be recovered by the profits of the farm. Judging from experience in England and India, it appeared to him most probable that the additional cost accruing from the disposal of the sewage on land would be recouped to them.—*Indian Engineer.*

ELECTRIC LIGHTING.—In connexion with this subject we have received from Mr. B. T. Batsford, a book by Mr. F. A. Fawkes, which contains sections and patterns for "architectural and enriched casings for electric wires," showing how the wiring can be laid in grooves in casings and skirtings, with screw-dome moulded covering pieces. We have also to acknowledge the receipt of Messrs. Blakey, Emmott, & Co.'s price-book of electric light machinery.

THE AMERICAN PRODUCTION OF PIG IRON.—The statistics published by the American Iron and Steel Association, and compiled from returns received direct from the manufacturers, show that, for the first time in the history of the iron industry of the United States, that country has at last succeeded in beating her great European rival, Great Britain, in the annual output of pig iron. We learn that the American production of crude iron last year was 9,202,703 gross tons (of 2,240 lb.). We in this country are somewhat less expeditious in getting early statistics of that nature, but it may be estimated that our output of pig iron in 1890 will be something under 8,000,000 tons so that the United States have outstripped Great Britain by close upon a million and a quarter tons. As the American production of pig-iron in 1889 was 7,603,642 tons, the increase in 1890 amounts to no less than 1,599,061 tons, or over 21 per cent. The output of 1889 being over 17 per cent. greater than in 1888 (when it was 6,489,738 tons), the combined increase in the last two years was over 38 per cent. It was stated that the increase of output in the second half of 1890 would have been much larger (the production in the first six months being 4,560,513 tons, and in the second six months 4,642,190 tons), had it not been for the blowing-out of many furnaces in December, which was caused by the strike of the Alabama coal miners and the financial stringency. As it is, the Americans may well be proud of a record which eclipses all former performances.

THE NORWEGIAN TIMBER TRADE IN 1890.—Last year Norway exported 1,848,000 cubic metres of timber of all kinds, as against 2,021,500 cubic metres in 1889, or 8½ per cent. less. Great Britain was the largest importer, taking more than half of the total quantity exported. The quantity of planed wood goods for building purposes exported was 8 per cent. less than in 1889. Of the total, 56 per cent. went to this country. Prices were, in consequence of over-production, very low, and will no doubt remain so. In consequence of this, all the leading saw-mills in Scandinavia have agreed to reduce this year their output by 25 per cent., representing about 350,000 standards. The wood pulp trade last year was in a wretched state, prices being ruinously low. Of mechanically-made pulp 205,000 tons were exported, against 190,000 tons in 1889, and as much in preceding years. Of chemical pulp 26,000 tons were exported, as against 25,000 tons in 1889. The value of the pulp exported is estimated at about 80,000*l.*

THE FRANKFORT ELECTRICAL EXHIBITION.—Exhibits are still received for the great electrical exhibition to be held in Frankfort between May 15 and October 15. The committee arranging the exhibition is styled Comité der Electrotechnischen Ausstellung zu Frankfurt am Main.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
Main Drainage Scheme	Girvan (N.B.) Police Commrs.	Not stated	Mar 21
*Church at Winnington	The Committee	do	Mar. 31
*Drawings for Laying-out and Development of Property	West of England Land and Investment Trst. Limited	25l. and 15l.	do.
*Technical School, Rochdale	The Committee	50l. and 30l.	April 11
*Covered Market, Arcades, and Shops, Halifax	Markets and Fairs Committee	100l. 50l. and 30l.	May 1
*Cross Deaf and Dumb School	The Committee	Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer	Tenders to be delivered.
*Supply of Materials	Hendon Local Board	S. S. Grimley	Feb. 23
*Works and Materials	Mortlake Highway Bd.	H. Richards	do.
Eight Houses, Brighstown, Halifax	Geo Buckley & Son	Geo Buckley & Son	Feb. 24
*Roadmaking and Paving Works	Willesden Local Board	O. Claude Robson	do.
*Works and Materials	do.	do.	do.
Re-making Sidmouth-road	Newes-Re-under-Lyme Town Council	Jas Pattison	do
Thirty-one Cottages at Pontrhondda	Llwynypia Fldg Club	R. S Griffiths	do.
New Branch Office, Coleraine	Belfast Banking Co Lim.	S. P. Close	do.
Arch, Manchester Ship Canal	Runcorn Impt. Com.	Official	do.
School, Caretaker's House, Kitchen, &c.	Cardiff School Board	J. P. Jones	Feb. 25
Extension of Board School	do	Robinson & Salmon	do.
Enclosing and Fitting Show Yard, Exmouth	Devon County Agricultural Association	Official	do.
*Paving Works	Hackney Board of Works	J. Lovegrove	do.
*Works and Materials	Hammersmith Vestry	H. Mair	do.
Sewering, Kerbing, &c.	Handsworth U.S.A.	E. Knowerthy	do.
Additions to Hospital, Fusehill Workhouse Carlisle	Guardians	Jas. Murchie	do.
Kerbs, Setts, Gullies, &c.	Gateshead Corporation	J. Bower	Feb. 26
Additions to Vicarage, Upton, Bishop Burn Rose		Nicholson & Son	do.
Repairs, Public Baths	Northwich Local Board	Official	do.
Sewering, Paving, Levelling, &c. Back Ainley-street	Elland Local Board	G. Hepworth	do.
Pipe Sewers (2,200 feet)	Devonport Town Corn.	John F. Barns	do.
Main Sewer, Donagh, Antrim	Guardians	J. Clark	do.
Three Retort Vaults, Hydraulic Mains, &c.	Heckmondwike GasCo.	Offi.	do.
Three Houses, Belmont, Belfast	David Shaw	Sam. Stevenson	Feb. 27
Additional Water Supply	Largs Commrs.	W. R. Copland	do.
Re-roofing Church, Millfield, Ireland	Vestry	Thos Drew	Feb. 28
Retort House, &c.	Burton-on-Trent T.C.	T. L. Rushton	do.
Granite Road Metal	Lower Stratforth and Tickhill Highway Bd	Official	do.
Additions to Schools, Llangarw	Llangeinor School Bd	G. T. Lambert	do.
Five Dwelling Houses, St. Leonard's Road	J. B. Crocker	John Dennis	do.
*Supply of Materials	Wakefield U.R.S.A.	F. Massie	do.
Farm Buildings, House, and Infectious Disease Hospital	Meanston Asylum Committee, Yeadon	J. V. Edwards	Feb. 30
*Repairing Road Materials	Mar. Local Board	Official	Mar. 2
*Making up Roads	Islington Vestry		do.
Add to 2 to Board School, Lr. Wimborne	Knowle School Board	H. F. J. Barnes	do.
Pavil. n. Building Green	Hildax Cricket and Football Club	Jackson & Fox	do.
*Isolation Hospital	Brentford Local Board	J. H. Stratton	do.
*Sewerage Works	Hornsey Local Board	T. de Courcy Meade	do.
Making-up of Private Roads		do.	do.
*New Isolation Block at Hospital		do.	do.
*Foreman's House at Highgate Depôt		do.	do.
*Works and Materials		do.	do.
Brick Fence Wall	York Corporation	Alfred Creer	do.
Making Road and Laying Sewers	Sedbury Building Soc.	W. W. Robinson	do.
Laying Water Mains	Morley Corporation	Chas. Gott	do.
*Iron Bridges at Infirmary	St. Marylebone Guar.	A. Saxon Snell	do.
*Purchase and Pulling down Bulling Mat.	School Bd for London	Official	do.
Township Offices	Killiney & Ballybrack Town Commrs.	Sir T. Deane & Son	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Works and Materials	Camberwell Vestry	Official	Mar. 2
*Sewers Works, Supply of Disinfectants, &c	do.	do.	Mar. 3
Diverting Portion of Hebble Brook and Sewering	Halifax Corporation	E. R. S. Escott	do
Road Works	Wigton (Cumberland) Highway Board	John Sibson	do.
*Alteration and Extension of School	Burton-on-Trent Sch. B	R. Churchill	do.
*Works and Materials	Lewisham Rd. of Wks.	Official	do.
*New Warehouse	G. W. R.	do.	Mar. 4
*Painting York Station	W. E. R.	H. Copperthwaite	do.
Intercepting Sewer	Halifax Corporation	E. R. S. Escott	do.
Re-building "Black Bull Inn," Aiwalton, near Bradford, Yorks		Jackson & Fox	do.
*Roadmaking and Paving Works	Fulham Vestry	W. Sykes	do.
*Pipe Sewers, &c.	do.	J. P. Norrington	do
*Supply of Broken Granite	Cranbrook R.S.A.	Official	do.
Granite Road Metal (10,000 tons)	HardingstoneHigh. Bd.	do.	do.
Seven Cottages, Tantobie	Tanfield District Industrial Soc. Ltd.		Mar. 5
*Escape Staircases	Wandsworth and Clapham Union	T. W. Aldwinckle	do.
*Works and Materials, Weymouth Sub District	War Department	Official	Mar. 6
*Alteration and Additions to Workhouse	Tonbridge Union	W Oakley	do
Public Baths	Stamford Corporation	W. Blackshaw	do.
*Taking down and Re-building Lexford Bridge	Essex County Council	P. J. Sheldon	Mar. 7
*Stoneware Sewer Pipes and Gully Traps.	Bath U.S.A.	C. R. Fortune	do.
Concrete Reservoir	Bethnal Green Waterworks Co Lim.	Official	do.
*Wrought-iron Fence, Entrance Gates, &c.	Beckenham Local Bd.	G. B Carttar, C.E.	Mar. 9
*Laying of C. I. Pipes (Sea Water scheme)	Bournemouth Twn C.	F. W. Lacey	do.
*Works and Materials	War Department	Official	do.
*Works and Materials, Shoreditch Sub District	do.	do.	do.
*Maintenance and Repair of Roads	Kent County Council	do.	Mar. 10
*Repairing Roads	Borough of Croydon	do.	do.
*Works and Materials	Rotherhithe Vestry	do	do.
*Main Drainage Extension Works	West Ham Council	Lewis Angell	do.
*Thirty New Almshouses, Chapel, &c.	Trustees of Washington Hospital Charity	W. Watson	Mar. 11
*Construction of Reservoir	Windermere Gas and Water Co.	J. Newton & Son	do.
*Road Materials and Team Labour	Norfolk County Coun.	Official	do.
*Works and Repairs, Building Materials, &c. Chatham	War Department	do.	Mar. 13
*Infectious Diseases Hospital	Borough of Blackburn	do.	Mar. 14
*114 to 124 Cottages	Blaina Cottage Building Co.	E. A. Johnson	do.
Fourteen Dwelling houses, Holywell Green, Halifax		C. F. L. Horsfall & Son	do.
*Works, Materials, &c.	Bath U.S.A.	C. B. Fortune	do.
*Works and Materials (Gravesend Sub-District)	War Department	Official	Mar. 16
*Works, Repairs, Building Materials, &c. Aldershot	do.	do.	Mar. 18
Work at Congregational Church, Hanley, Staffs.		A. P. Miller	No date
Additions and Alterations to Public Buildings, Rechill	Rechill Market Hall Co.	Clayton & Black	do.
Detached Villa, Ilkley, Yorks		C. H. Hargreaves	do.
New Co-operative Stores, Loftus-in-Cleveland		Clark & Moscrop	do.
Leicestershire Road Metal and Slag	Towcester Highway Bd.	R. W. Rolfe	do.
New School Buildings and Alterations of existing Building, Darnal, Sheffield		C. J. Innocent	do.
New Stores	Broomhill, Northern Co-operative Soc.	Oliver & Lesson	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Street Inspector and Inspector of Nuisances	St. Giles B. of Works	32s.	Feb. 23
Sanitary, &c. Inspector	Worthing Twn Coun.	160l.	Feb. 25
*Engineer and surveyor	Llandudno Impt. Com.	200l.	No date
*Clerk	do.	150l.	do.

Those marked with an Asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv., vi., vii., viii and ix. Public Appointments, p. xxi.

ELECTRIC LIGHTING FOR COVENTRY.—On the 10th inst., a special meeting of the Coventry City Council was held to adopt the necessary resolution as a preliminary to obtaining powers for the introduction of the electric light into Coventry. The Deputy-Mayor (Alderman Thomson) presided, and proposed "That application be made to the Board of Trade for a Provisional Order, under the Electric Lighting Acts, 1882 and 1888, authorising the Mayor, Aldermen, and citizens of the city of Coventry, to erect and maintain electric lines and works and produce, store, supply, and distribute electricity for public and private purposes within the city of Coventry, and that all proceedings heretofore taken in that behalf be confirmed." Mr. Andrews seconded, and the resolution was carried unanimously.

THE ENGLISH IRON TRADE.—The persistent sameness of the reports regarding the condition of the English iron trade which reach us week after week is becoming almost tantalising, and yet there are but slight signs of a change for the better. The iron market continues quiet, if not dull, the policy both with buyers and sellers being still to restrict their transactions to small quantities with short deliveries. Pig-iron has been tolerably steady during the week in the North of England and Scotland, but there is a tendency to weakness in Lancashire and the Southern districts, and sales below makers' quotations are reported. Bessemer iron is easier, and 1s. a ton lower, the depression being due partly to the large stock of hematite warrants, partly to the quietness in the steel trade. The business in finished iron is only moderate, and there has been a further drop in black sheets of 2s. 6d. a ton, owing to the inability of the sheet-iron makers to rehabilitate their combination. Tin-plates are rather quieter, but strong in tone. The shipbuilding trade is unchanged, but engineers report a decline in fresh orders.—*Iron.*

NEW PETROLEUM SPRINGS.—Russian journals state that petroleum springs of immense volume have been discovered near the town of Tvapse, on the Black Sea. They are situated so that the oil may be carried through iron mains direct into tank vessels, and it is expected that the new supply will greatly influence the Russian oil trade.

ROYAL ENGLISH OPERA HOUSE.—In our description of this building last week we omitted to mention that the whole of the exits are fitted with Kaye's "Patent Panic Fittings," as approved by the County Council. The swing doors with their automatic bolts allow the door to swing, but securely fasten when required.

ASSOCIATION OF MANCHESTER STUDENT ENGINEERS.—The fourth annual dinner of the Association of Manchester Students of the Institution of Civil Engineers took place on the 11th inst., in the Victoria Hotel, Manchester. Mr. J. Abernethy, past President of the Institution of Civil Engineers, presided. Mr. C. F. Budenberg proposed "The Institution of Civil Engineers," and, the chairman having replied, Mr. Thomas Ashbury proposed "The Association of Manchester Students." Mr. R. H. Heenan, the President, in responding, said that during his presidency he had tried his best to bring about the union of the students with the other members of the profession, because the example of the elder members could not be very well followed by those who had never seen them. He concluded by presenting to Mr. A. D. Greatorex, Assistant Borough Engineer of Southampton, an address and a timepiece in recognition of his services as secretary of the Association for the last four years. Mr. Greatorex expressed his thanks for the gift. The other toasts included "The Ship Canal" (proposed by Mr. L. B. Wells and responded to by Mr. E. Leader Williams).

MEETINGS.

SATURDAY, FEBRUARY 21.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." II. 3 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." III. 4.15 p.m.

Edinburgh Architectural Association. — Visit to Register House.

MONDAY, FEBRUARY 23.

Society of Arts (Cantor Lectures). Mr. Gisbert Kapp on "The Electric Transmission of Power." II. 8 p.m.

TUESDAY, FEBRUARY 24.

Institution of Civil Engineers. (1) Further Discussion on Messrs. Llewelyn B. and Claude W. Atkinson's paper on "Electric Mining-Machinery." (2) (time permitting) Mr. J. Thornhill Harrison, on "The Subterranean Water in the Chalk Formation of the Upper Thames, and its Relation to the Supply of London." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. Charles Jones on "Scavenging, Disposal of Refuse and Sewage." 8 p.m.

Builders' Clerks' Benevolent Institution. — Annual General Meeting of Donors and Subscribers. 7.30 p.m.

Birmingham Architectural Association.—Mr. T. E. Bateman on "Castle Bromwich Church." 7.30 p.m.

WEDNESDAY, FEBRUARY 25.

Carpenters' Hall (Free Lectures to Artisans).—Professor J. W. Groves on "Timber: its Growth and Decay." 8 p.m.

St. Paul's Ecclesiological Society.—Paper by Mr. E. P. Loftus Brock, F.S.A., entitled, "Notes on the Ancient Churches of Middlesex." 8 p.m.

THURSDAY, FEBRUARY 26

Society for the Encouragement of the Fine Arts.—Mr. Alfred Gilbert on "The Moral and Intellectual Influences of Music." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Institution of Electrical Engineers.—8 p.m.

FRIDAY, FEBRUARY 27.

Institution of Civil Engineers (Students' Meeting).—Mr. B. Chatterton on "Disintegrators." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. Shirley F. Murphy on "Infectious Diseases and Methods of Disinfection." 8 p.m.

Society of Arts (Popular Afternoon Lectures).—Captain Abney, F.R.S., on "The Science of Colour." 4.30 p.m.

SATURDAY, FEBRUARY 28.

Architectural Association.—Visit to St. Stephen's Church, Stepney.

Builders' Foremen and Clerks of Works' Institution.—Annual dinner, Holborn Restaurant. 6 p.m

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." III. 3 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." IV. 4.15 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

2,792.—APPARATUS FOR CARRYING PLATE-GLASS: *J. J. Spear.*—This invention relates to an apparatus lifting on two hooks secured to conveyance and easily raised; made of wood and iron, the flat surface being covered with felt so as to form a soft bed on which the plate will rest. Wood buttons support the glass when putting on and off, and when flat two rollers will take the back weight and run themselves clear.

3,285.—BRICK-MAKING MACHINERY: *W. Sayer.*—In order to prevent the clay or plastic material from clogging, the knives, cutters, or worms, the pugging or expressing knives, and worms are made of a rounded section from where the knive-blade joins the boss to the periphery.

3,481.—GAS OR OIL STOVES AND BOILERS: *J. T. Spencer.*—According to this invention, mirrors or reflectors are arranged on the door of stove, so that stooping to regulate the flame is unnecessary.

7,601.—GULLY TRAPS: *J. W. Welsh.*—The trap which is the subject of this patent is made in one piece with trap, dish-stone, and double dip-seal, with a ventilator and inspection hole between them. The waste and slop water pass through a loose cast-iron perforated grating into a small trap-chamber, preferably formed with a rounded bottom without angles so as to prevent any deposit occurring; two dips, the one nearest the house being deeper than the other, dip down into this chamber or bend, and, beyond those and at a point higher than either, the exit to the drain is placed; between the two dips is an inspection or cleaning-hole which is closed by a plate of clay or iron covered with asphalte or some impervious substance placed above the level of the overflow to the drain, and, below this hand hole but still in the air space above the water-line, is a branch-pipe leading to the open-air outside the house. If the pressure is too strong, and it passes the first dip, it rises into the intermediate air-chamber, thence through the ventilating-pipe, and into the outside air, the greater depth of the second dip preventing its going farther and entering the house. The trap is set level and then the two water-seals are perfect.

16,328.—SPIRIT-LEVELS: *H. Green.*—The glass carrying the spirit and bubble is curved, and shows, in connexion with an indicator or plate, on the stock of the level, the angle at which it is moved.

18,742.—PARQUET FLOORING: *J. Idrac.*—This invention relates to a cheap form of parquetry, is termed "parquet surchénés," and is made of compound blocks, —&c., only the upper part of each block is composed of expensive wood, the lower or under part, which only serves to support and strengthen the upper part, is of cheap wood, the two parts being secured together by glue and by being dovetailed together by a novel form of joint.

NEW APPLICATIONS FOR PATENTS.

February 2.—1,847, J. Mellor, Door Check and Closer. —1,853, G., J., and M. Clarke, Water-closets, &c.—1,875, R. Fisher, Heating Buildings.—1,885, H. Symons, Slate Slip for Repairing Slated Roofs

February 3.—1,936, J. Wild, Combined Gully and Flusher for Sewage and Closets.—1,940, H. Herrmann, Parquet Floor.—1,959, H. Lake, Fire Grates.

February 4.—1,995, R. Hield, Hinges.—2,001, T. Hughes, Construction of Artisans' Dwellings or Workmen's Cottages.—2,012, J. and J. Campbell, Flush Cisterns.—2,014, E. Mobbs, Flushing Water-closets, &c. —2,017, J. McGlashan and E. Braidwood, Fireproof Decorative Material for Ceilings, Walls, Woodwork, &c —2,071, G. Blanks and B. Lefebure, Dry-press Brick making Machines.—2,078, W. Munns, Door Stop.—2,080, W. Munns, Stone-crushing Machine.

February 5.—2111, R. Faulkes and others, Jointing Drain or other Pipes.—2,116, J. Aspinall, Whitewash brushes.

February 6.—2,222 A. Jolliffe, Attaching Door-knobs to Lock spindles.

February 7.—2 273, C. and J. Rouldsworth, Wind, Dust, and Rain Excluder for Doors.—2,278, E. Smith, Baker's Ovens.—2,288, J. Bartlett, Ventilating Cowls.

PROVISIONAL SPECIFICATIONS ACCEPTED.

20,638, R. Stanley, Boring or Tunnelling Machines.—21,035, D. McKellar, Bench Stops.—21,087, J. Sepulchre, Increasing and Regulating the Draught of Fire-places and Stoves.—21,120, J. Longworth, Closing, Latching, and Opening Doors. S. J. Kaye, Stops for Doors, Gates &c.—17, T. and E. Collins, Glazing Roofs, &c.—70, C. Sharp and J. Firth Fire-grates.—124, J. Bobart, Open Fireplaces.—160, N. Dennys, Anti-fouling Paint for Wood and Metal.—418, A. Spanier, Fireplaces.—546, E. Wright, Fireplaces and Cooking-ranges.—681, C. Day, Prevention of Smoke from Fireplaces.—747, W. Redish, Fire-grates.—775, A. Carrs, Disinfecting Apparatus.—977, W. Small and J. Ewart, Roof-gutters.—1,078, G. Charlton, Reversible Windows.—1,147, R. Heaton, Cottage Dwellings.—1,237, W. Munns, Building Construction.—1,345, H. Burnet, Preventing Water-pipes from Bursting.—1,558, E. Smith, Parquet Flooring.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

16,473, E. Blount, Door Check.—19,446, H. Dwight and others, Hanging of Doors.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

FEBRUARY 10.—By *Phillips & Dyer:* 39, Queen's-rd., St. John's Wood, u.t. 46 yrs., g.r. 15*l.*, 800*l.*; 54, Alfred-rd., Paddington, u.t. 58 yrs., g.r. 5*l.*, 315*l.*—By *T. D. Westacott:* 1, Rhodes-st., Barnsbury, u.t. 67 yrs, g.r. 5*l.*, 80*l.*, 240*l.*; 24, Nailour-st., Caledonian-rd., u.t. 60 yrs., g.r. 10*s.*, r. 30*l.*, 30*l.*; 2, Twyford-st., u.t. 53 yrs., g.r. 7*l.* 10*s.*, r. 34*l.*, 425*l.*—By *Dunn & Soman:* 111, Hopton-rd., Streatham Common, f., 630*l.*

FEBRUARY 11.—By *Messrs. Aldridge:* 20, Osborne-rd., Thornton Heath, and a plot of land, f., 300*l.*—By *Alderson & Co:* F.g.r. of 10*s.*, with reversion in 43 yrs., Atkinson-rd., Clapham, 560*l.*; f.g.r. of 35*l.*, with reversion in 33 yrs., Thornton-rd., 3,000*l.*; f.g.r. of 31*l.*, with reversion in 33 yrs., South-rd., 2,250*l.*; f.g.r. of 10*l.* and 15*l.* 14*s.*, with reversion in 33 and 43 yrs., 1,270*l.*; f.g.r. of 77*l.*, with reversion in 33 yrs., Atkins-rd., 4,595*l.*; f.g.r. of 382*l.* 10*s.*, with reversion in 33 yrs., Thornton-rd., 7,695*l.*; f.g.r. of 47*l.*, with reversion in 43 yrs., Clarence-rd., 1,310*l.*; f.g.r. of 80*l.*, with reversion in 33 yrs., 2,220*l.*; f.g.r. of 25*l.*, with reversion in 33 yrs., King's-rd., 1,400*l.*

FEBRUARY 12.—By *Hoppe & Sowdon:* No. 528, Commercial-rd., E. c., 260*l.*; No. 116, Whitehorse-st., u.t. 11 yrs., g.r. 21*l.*, r. 53*l.*, 30*l.*; 115, Brook-street, u.t. 29 yrs., g.r. 10*l.*, r. 36*l.*, 105*l.*—By *Newton & Co.:* 55, Albion-grove, Barnsbury, u.t. 52 yrs., g.r. 7*l.*, r. 44*l.*, 450*l.*—By *Weston & Son:* 1 to 5, Lansfield-ter., Streatham, f., 1,000*l.*; 16 to 24, Burgoyne-rd., Stockwell, u.t. 70 yrs., g.r. 25*l.*, r. 143*l.*, 655*l.*; 28, Burgoyne-rd., u.t. 76 yrs., g.r. 5*l.*, r. 28*l.* 12*s.*, 230*l.*; 3 and 11, Lawrence-rd., Brixton, u.t. 58 yrs., g.r. 10*l.* 10*s.*, r. 82*l.*, 525*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS

TIMBER.

Greenheart, B.G.		
Do.	6 10 0	7 15 0
Teak E.I. load	8 0 0	14 0
Pitch Pine	2 5	"
Australian	2 5	"
Ash, Canadian	2 10 0	4 0
Birch	2 5 0	4 0
Elm	3 0 0	4 5
Oak, British	3 0 0	4 15 0
Do., Canadian	2 10 0	3 10 0
Canada	4 15 0	6 5 0
Pine, Canada, red	2 10 0	3 10 0
Do., yellow	2 0 0	3 10 0
Lath, Dantzic	0 0 0	0 0 0
St. Petersburg	5 0 0	7 0 0
Deals, Finland,		
2nd & 1st std. 100	7 0 0	10 0 0
Do. 4th & 3rd	7 0 0	8 0 0
Do. 5th	6 0 0	7 10 0
St. Petersburg,		
1st yel.	9 0 0	14 0 0
Do. 2nd yellow	8 0 0	9 0 0
Do. white	6 10 0	10 0 0
Swedish	6 10 0	15 0 0
White Sea	8 0 0	10 10 0
Canada, Pine 1st	15 0 0	24 0 0
Do. 2nd	9 0 0	15 10 0
Do. 3rd	7 0 0	11 0
Do. Spruce, 1st	8 10 0	10 10 0
Do. do. 2nd & 3rd		
2nd	6 0 0	7 10 0
New Brunswick	5 0 0	7 0 0
Battens, all kinds	4 10 0	15 10 0
Flooring Boards,		
1st yel.	0 10 0	0 14 0
2nd	0 9 0	0 10 0
Other kinds	0 8 0	0 7 6
Cedar, Cuba	/3	/4
Honduras, &c.	/4	/5
Mahogany, Cuba	/4	/6
St. Domingo		
Do.	0 0	0 0
Mexican	0 0	0 0
Tobasco	0 0	0 0
Honduras	0 0	0 0
Box, Turkey	4 10 0	15 0 0
Rose, Bahia	10 0	18 0 0
Lignum Vitæ	18 0 0	20 0 0

TIMBER (*continued*).

Satin, St. Do.		
Do., Jamaica	0 0 9	0 1 3
Pernambuco	0 0 10	0 1 6
Walnut, Italian	0 0 5	0 0 7
METALS.		
Iron Bars, Welsh,		
Hammered	6 0 0	6 15 0
Do. at works		
Do., Swedish	5 1 0	6 5 0
Do., Staffordshire,		
at Hall	6 5 0	7 0 0
Cast, British,		
cake and ingot	50 0 0	57 0 0
Best selected	58 0 0	60 0 0
Sheets, strong	68 0 0	90 0 0
Chili, bars	42 10 0	0 0 0
Yellow Metal	0 0 6	0 0 6½
Lead, Pig,		
Spanish	12 8 9	12 10 0
English, soft		
Do., hard	0 0 1	12 12 6
Sheet, Milled,		
Patent Shot	1 0 0	0 0 0
Pipe	1 0 0	0 0 0
Zinc, English,		
Sheet	27 10 0	0 0 0
Vieille Montagne		
Do.	28 0 0	0 0 0
Tin, Straits, Cash	90 1 0	0 0 0
Australian	90 1 0	0 0 0
English ingots	94 10 0	0 0 0
OILS.		
Linseed	ton 21 15 0	22 0 0
Cocoanut, Cochin	35 15 0	0 0 0
Do. Ceylon	29 0 0	0 0 0
Palm, Lagos	25 0 0	0 0 0
Rapeseed, English		
pale	28 10 0	29 1 0
Do. brown	27 0 0	0 0 0
Do. refined	29 0 0	0 0 0
Do. foreign	27 10 0	0 0 0
Do. refined	29 10 0	0 0 0
TAR—Stockholm		
barrel	1 7 6	1 9 0
Archangel	0 14 6	0 0 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BRENTFORD.—For constructing new road round the Royal Oak Inn, the Brentford Local Board. Mr. J. H. Stevens, surveyor:—

[illegible]	£1,438 0	[illegible]	£1 [illegible]
[illegible]	[illegible]	[illegible]	[illegible]
Macey	1,07[illegible]	[illegible]	[illegible]

* Accepted.

BRENTFORD.—For making up [illegible] Road, Brentford. Mr. J. H. Stevens, Surveyor:—

Macey	£1,[illegible]	[illegible]	£[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

* Accepted.

BRISTOL.—For public [illegible] Mr. W. H. [illegible] Mr. [illegible]:—

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[All at Bristol.]

CARDIFF.—For works in connexion with the Docks Pumping Station, the Docks Committee. Mr. W. Harris, Engineer:—

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

* Accepted.

No. 1 Contract.—Excavating and Trenching, for Watermain and Fittings.

Cresselloss	£[illegible]	Hartland	[illegible]
Robert Barry	[illegible]	Edmund Lewis	72 16 0
James Garland	2[illegible]	H. J. Davies	67 18 4
Batchelor & Snowdon	220 2 6	[illegible]	[illegible]
Cann & Hadley	220 0 0	[illegible]	57 1 8

No. 2 Contract.—For Supplying and Laying and Fixing of Watermain and Fittings.

J. G. Proger	£246 13 0	Cross Bros., Cardiff*	274 5 0
Batchelor & Snowdon	308 0 0	H. J. Davies	298 6 8

* Accepted.

Work in both cases tendered for on the schedule of prices, according to net measurements.

CARLISLE.—Accepted for the erection of ten houses in Morley-street, for Mr. J. J. Fearnley. Mr. H. H. Hodgkinson, architect, 54, Bank street, Carlisle:—

Builders. G. & N. Bell	£980 0 0
Joiner. J. Hudson	353 0 0
Plasterer. J. Harrington	113 0 0
Slater. J. Smith	54 4 7
Plumber.—W. J. Wilson (accepted)	67 7 6
Painter.—S. Allan	20 18 6
Ironfounder. J. Edmondson	17 0 0

[All of Carlisle.]

CASTLEFORD.—For paving, flagging, &c., Oxford-street, for the Local Board. Mr. H. H. Brondbent, Surveyor, Local Board, Castleford. Quantities supplied:—

Feather & Speight, Micfield	£3,333 15 2½	D. Speight	£3,115 0 0
Taylor & Speight	3,331 2 2	Josh. Speight	3 088 17 6
Geo. Walker	3,267 3 11	C. Ledgar, Leeds*	2,892 0 0

* Accepted.

DUFFTOWN (N.B.).—Accepted for the erection of a new infant school and about 400 yards of enclosure walls for the Mortlach School Board. Mr. Geo. Sutherland, architect, Dufftown, N.B.:—

Builder. R. & J. M'Intosh, Bin Hs.
Carpenter. David M'Kay, Dufftown.
Plumber. John Watson, Huntly.
Plasterer. Alex. Grant, Elgin.
Slater. Geo. Murray, Dufftown.
Painter. Edward J. Gordon, Dufftown.

EARLESTOWN.—For the erection of new schools for the Earlestown District School Committee. Messrs. B. & S. Burdett, architects. Hardware, tree st. &c.:—

Wm. Harrison	£[illegible]	Bolt & Barker	£1,87[illegible]
Thos. Richardson	[illegible]	Wm. M'Intosh	1,8[illegible]
Jno. Whittaker	1,825	Jno. Unsworth, Lowe's	
Peter Tickle	1,801	Town (as [illegible])	1,725

ENFIELD HIGHWAY.—For the erection of twenty-three villas, St. Stephen's-road, E. Enfield Highway, for Mr. W. G. B. Beck. Mr. Edward Clark, architect:—

J. & H. Cooke	£6,[illegible]	[illegible] Tall	£7,0[illegible]
W. Shurmur	6,[illegible]	J. Arnell	4,[illegible]
J. Bryce	5,41[illegible]		

HALIFAX.—Accepted for the [illegible] and formation of an approach road abutting on the Victoria Cattle Market. Mr. T. Lodge Pickard, architect:—

Masons and Bricklayers [illegible]	£147	0	0
Carpenters and Joiners W. H. [illegible]	100	0	0
Plumber and Glazier C. A. [illegible]	38	6	0
Slaters and Plasterers [illegible]	27	0	0

[All of Halifax.]

Land £12 0 0

HOUNSLOW.—For [illegible] at Gunnersbury House, for Mr. Keith D. Young. Mr. S. Woodhead, [illegible] and surveyor, Bentinck-[illegible], W.:—

[illegible]	[illegible]	[illegible]	£[illegible] 0 0
[illegible]	[illegible]	[illegible]	£[illegible] 0 0

ISLINGTON.—For [illegible] at No. [illegible], Caledonian-road, for Mr. [illegible] Mr. S. W. [illegible], surveyor, Britannia [illegible]:—

Hoyle & [illegible]	[illegible]	[illegible]	£[illegible] 0 0

LEAMINGTON.—For extensive additions and alterations to Warneford Hospital, for the Committee of Management. Mr. Keith D. Young, architect, 9, Southampton-street, Bedford-[illegible], W.C.:—

Brown & [illegible]	[illegible]	[illegible]	£13,7[illegible] 0
Lowe	[illegible]	[illegible]	[illegible]
Ward	[illegible]	[illegible]	[illegible]
Smith & Sons	[illegible]	[illegible]	[illegible]
Bowyer & [illegible]	[illegible]	[illegible]	[illegible]
Loader, Nye & [illegible]	[illegible]	[illegible]	[illegible]
Read, Ibbotson & Co.	[illegible]	[illegible]	[illegible]
Hill	[illegible]	[illegible]	[illegible]

LEEK.—Accepted for the [illegible] of a [illegible] for the Leek Local Board. Mr. [illegible], Surveyor to the Local Board, architect:—

[illegible]	[illegible]	[illegible]	£[illegible] 0 0
[illegible]	[illegible]	[illegible]	£[illegible] 0 0

LONDON.—For [illegible] at No. [illegible], Wellington-street, Strand, for the Land [illegible]:—

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

LONDON.—For alterations and repairs at No. 52, Stanhope-street, N.W. Mr. W. H. Collins, architect:—

Hearn & Co.	£[illegible]	[illegible]	[illegible]
H. Smith & Co.	474	Holland & Co.	[illegible]

LONDON.—For [illegible] at 45, Pond-st., Hampstead, for Messrs. Reuben Pain & Son. Mr. Alfred Conder, architect, Robert Palmer and Sons, Westminster, Quantities by Mr. Thomas Reed, 61, Lincoln's-inn-fields, W.C.:—

Wall & Co.	£[illegible]	[illegible] Lathan & Sons	£[illegible]
[illegible] Mansbridge	[illegible]	[illegible]	[illegible]
Thomas & Co.	[illegible]	[illegible]	[illegible]

LONDON.—For alterations to No. [illegible], Blenheim street, W. Mr. John Hamilton, architect:—

[illegible]	£[illegible]	W. Shurmur	£[illegible]
[illegible]	[illegible]	Snewin Bros. & Co.	[illegible]
[illegible]	[illegible]	Clapton (accepted)	[illegible]

LONDON.—For rebuilding No. 56, Old Kent-road, for the London and Provincial Bank, Limited. Mr. A. E. Hutchings, architect:—

Chatfers	£[illegible]	[illegible] & J. Jarrard*	£[illegible]
Piland Bros.	[illegible]	* Accepted.	

LONDON.—For alterations, additions, and repairs, at No. [illegible], Eastcheap, Islington for the London and Provincial Bank, Limited. Mr. A. E. Hutchings, architect, 11, Victoria-street, Westminster:—

Ashby	£[illegible]	[illegible] & J. Jarrard (accepted)	£[illegible]

NORWICH.—For the erection of infectious diseases hospital at North Heigham, for the Corporation. Mr. F. E. Matthew, City Engineer, Guildhall, Norwich:—

Hebner Bros.	[illegible]	Wilkin & Wilkins	£4,8[illegible]
Robt. Wegg	5,[illegible]	R. W. Bennett*	4 290
Smith & Watling	[illegible]	* Accepted	
Youngs & Son	[illegible]	[All of Norwich.]	

OLDCASTLE (Ireland).—For alterations and improvements to public-house in Canal-street, for Casey's Drogheda Brewery Company, exclusive of painting. Mr. V. Scott, architect:—

P. L. Scott	[illegible]	Thos. Grace, Oldcastle*	£306
M. Keenan	[illegible]	* Accepted.	

PEEL (near Gosport).—For the erection of a residence for Mr. E. Leane. Mr. Harry A. F. Smith, architect, Gosport:—

J. Croad	£1,9[illegible]	T. Dugan	£1,100
J. Crockerell	1 [illegible]	J. Plummer, Fareham*	999
Warehams	[illegible]	* Accepted.	

PENRYN (Cornwall).—For the erection of new Wesleyan chapel and school buildings, for the Wesleyan Trustees. Mr. J. Wills Trounson, architect, 27, Clarence-street, Penzance:—

G G Powell	£1,400	A. Carkeek, Redruth*	£1,276
T. Tonkin Rickard	1,397	Pooley	1,208
W. H. Stephens	1,300		

* Accepted.

PENZANCE.—For alterations and additions to 9, St. Mary's-terrace, Penzance, for Mr. Lanham. Mr. Oliver Caldwell, architect, Penzance

Mason Work

John Burnett	£270	Alfred Trythall	£215
Rowe & Pidwell	270	William Ford, Penzance*	218

Carpenter's Work

Joseph James, Penzance*	£258	W. H. Trounson	242

* Accepted.

SEVENOAKS.—For levelling, metalling, kerbing, tar-paving, channelling, &c., Gordon-road, for the Local Board. Mr. Jabez Mann, Surveyor, Local Board Offices, Sevenoaks

E & W Iles	£916 3 0
Henry Lee	747 0 0
David Mauche	665 10 0
Sidney Hudson, West Dulwich*	660 9 7

* Accepted according to schedule of prices. Surveyor's estimate, £800 0s. 0d.]

SHEPPERTON (Middlesex).—For all drainage and rabbit-work (exclusive of stables and entrance lodge) to The Poplars, East Halliford, near Shepperton, Middlesex, for Mr. Stephen W. Fry, J.P. No quantities supplied. Mr. James Neale, F.S.I., F.R.I.B.A., 10, Bloomsbury-square, London, W.C.

Thos. Knight & Sons, Chertsey	£1,297 10 0	Joseph Norris, Sons, Knaphill*	£1,134 10 0

* Accepted.

SOUTHAMPTON.—For providing and laying down tesselated pavement, bollards, shoe-scrapers, slipper-baths, water-troughs, &c., at the Pound, Pound-lane, for the Corporation. Mr. W. B. G. Bennett, Architect and Surveyor, Southampton:—

J. Sparshott & Co.	£1,467 0 0	J. Bradford & Co.,	
T. Wood & Co.	1,451 17 8	Lidiard (accepted)	£1,025 0 0
J. L. Bone	1,200 0 0	Poole & Co.	978 0 0
J. & F. Hoy	1,195 0 0	Thomas & Taylor	730 10 0
Russell & Co.	1,070 0 0	W. Stratford & Son	700 0 0

STOKE-ON-TRENT.—For the erection of a detached house, Regent-street, Stoke-on-Trent, for Mr. W. Heath. Quantities supplied. Mr. A. E. Wood, architect, Tunstall, Staffs.:—

Thomas Cooper, Tunstall (accepted)	£565 0 0

TARA (Ireland).—Adjourned tenders on modified plans for building a medical residence, &c., for the Dunshaughlin Board of Guardians. Mr. A. Scott, architect, Navan, Ireland:—

P. O'Brien	£1,200	Thos. Mackey, Dublin*	£1,300
Luke Madden	1,295		

* Accepted.

TISBURY (Wiltshire).—For alterations and additions to Fyfe House, Tisbury, Wilts, for Mr. V. F. Benett-Stanford. Mr. C. Stanley Peach, architect, 8, John-street, Adelphi, W.C.:—

J. Shillitoe & Sons	£16,500	A. Estcourt & Son	£[illegible]
Stephens & Bastow	[illegible]	H. Hiley & Greenwood	14,777
H. J. Reed	13,980		

TUNSTALL.—For alterations and alterations to Woodlands Pottery, for Messrs. W. H. Grindley & Co. Quantities supplied. Mr. A. E. Wood, architect, Tunstall

Charles Cope, Tunstall (accepted)	£[illegible] 0 0

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VOL. LX. No. 2208. SATURDAY, FEB 28 1891.

ILLUSTRATIONS.

Byzantine Architecture: Illustrations to Professor Aitchison's Royal Academy Lectures :—
Ornament at Sta. Sophia, Constantinople, and St. Mark's, Venice ..... *Double-Page Ink-Photo.*
Marble Panelling and Mosaic Frieze, Μονὴ τῆς Χώρας, Constantinople.—Drawn by Mr. Sidney H. Barnsley ..... *Two Single-Page Ink-Photo's.*
Hambleton Old Hall: North Front: Plan and Details (from Gotch's "Architecture of the Renaissance in England") ..... *Single-Page Photo-Litho.*
Design for a Staircase for a Town Mansion, by Mr. T. Davison, A.R.I.B.A. ..... *Single-Page Photo-Litho.*

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English Renaissance Architecture.

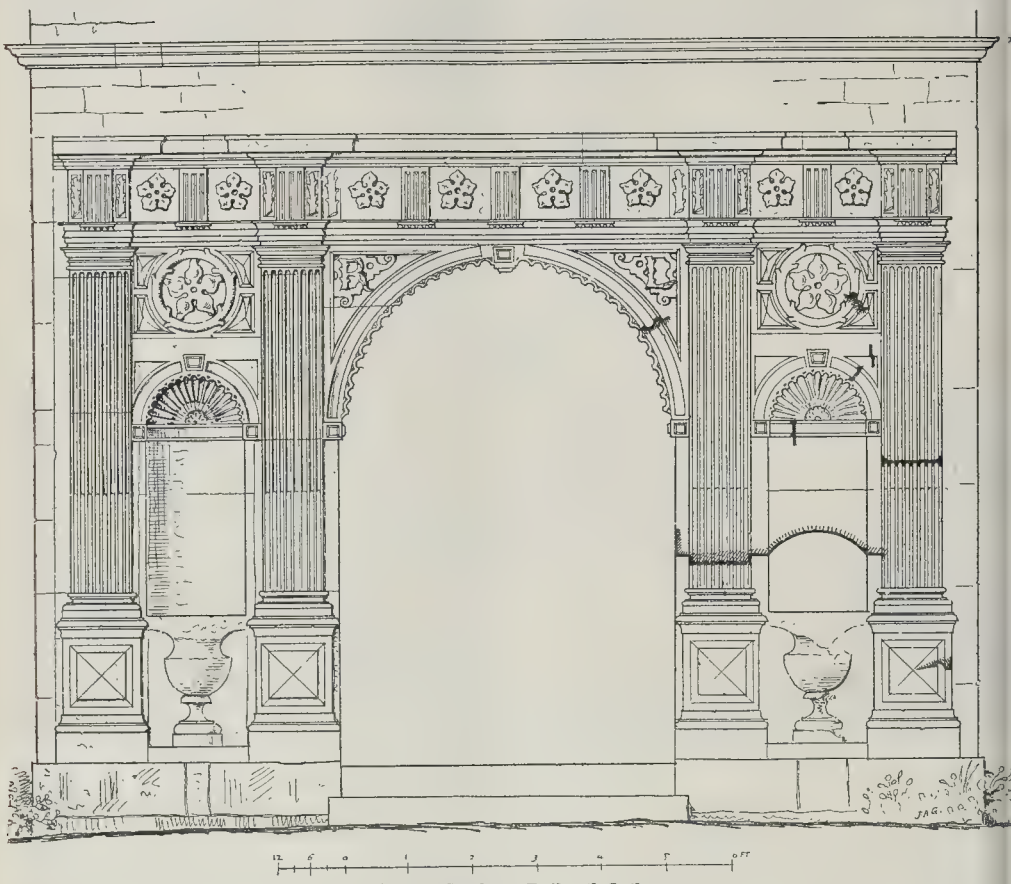
THE first part of Mr. Gotch's new illustrated work on English Renaissance architecture,* to be completed in six parts, promises us, at all events, a very complete and beautiful set of photographic illustrations of the most interesting and picturesque period of domestic architecture of this country. The dates between which the examples are selected will show at once that it has not been the object of the work to illustrate the central type of Renaissance architecture as it existed in this country when the Classic element had attained its full influence, but the period when English architecture was beginning to feel the effect of the Italian revival, but still retaining a specially English character of its own. The mullioned window still remained; the "order" had been adopted in a manner rather picturesque than classic, an elegant ornament to the architecture, but subordinate to the effect of the whole; not, as in the Palladian type of architecture, overpowering and crushing the domestic feeling and expression out of the building. It was fortunate that the taste for sumptuous habitations, and the spirit of rivalry among wealthy and powerful Englishmen in this respect, should have arisen just at this juncture, when the Renaissance movement had brought into England a taste for dignity and refinement in the architectural design of houses, but had not yet obliterated the feeling for freedom of treatment and picturesqueness of plan and outline. In regard to this matter of plan, however, we cannot but express our disappointment in regard to the almost entire absence of plans, the only plans given being the small one of Apethorpe in the text, and that of Hambleton Old Hall, which is included in the page of illustrations from this interesting house which, by the author's permission, is reproduced to a smaller scale as one of our lithograph plates in this number. Of course the production of complete plans which are to be trustworthy would have immensely increased the labour in connexion with such a work as this, and perhaps even have prevented the undertaking; but we should have thought a few more might have been attainable. There is one argument to be urged on the other side, viz.: that the planning of the class of buildings here illustrated was not their strong point. From the modern point of view they were mostly very inconveniently planned, and therefore are not of value to modern architects as matter for study, except in a historical sense. The main object in building an Elizabethan or Jacobean mansion was not to produce a convenient or economically-planned house, but a stately one, which would show an impressive front on approaching it, and a fine suite of entertaining rooms within; and the end was more especially attained if these were finer and more stately than those in the new house of some rival owner in an adjacent county. This feeling of indifference to the minor and more prosaic elements of house-building is emphatically shown in the manner in which Bacon, in his otherwise admirable and suggestive essay "Of Building," dismisses the whole subject of subsidiary and service rooms in one curt sentence at the close of his essay—"As for offices, let them stand at distance, with some low galleries to pass from them to the palace."

It should be observed, before we go further, that the line drawing of which we give a reproduction does not represent the character of the bulk of the illustrations. Most of these are reproductions from photographs taken from the buildings, and produced by what in England is called the "Phototype" and in Germany the "Lichtdrück" process. The author has gone to Germany for the reproductions, which are very good, and represent the details of the buildings with great sharpness, the texture and jointing of the stones, and the incidents of light and shadow. But all this can be done as well in England, and we do not understand the fancied necessity which is supposed to have driven the author or his publisher to Germany to procure this form of illustration.

In his Introductory chapter the author sums up in a few words the characteristics of the period and of the style illustrated. All the houses, he observes, were built for show rather than comfort; symmetry was the prevailing characteristic, and the dwellers in these houses, he thinks, must have paid a heavy penalty often, in internal discomfort, for the show of dignity they made externally. This was probably the case, though in many instances it is very likely that a great deal more convenience of plan was possible even within the symmetrical lines of the exterior, than was actually attained by the rather rough-and-ready manner of planning which contented the "noble owner," who very often practically devised the plan himself, and probably only found out when he came to live in the completed house how many things he had overlooked. In the case of Burghley House, as is well known, and as Mr. Gotch notes in his remarks on the illustrations, the workmen applied directly to Lord Burghley for instructions, which he seems to have given according to his own ideas, but with the help probably of this or that expert as required. It is obvious that though a picturesque house could be built in this way, it would be impossible under this system to carry out a properly-devised and convenient plan.

The essay of Bacon, just now referred to, is of peculiar interest in regard to the illustrations of houses which belong to the date at which Bacon wrote, and some of which seem almost to have furnished the hints for his remarks and criticisms. What sort of house it was that the Elizabethan nobleman or statesman dreamed of for himself, and accomplished if he could, we might gather pretty accurately from this essay, even in default of existing examples. Bacon indeed begins by observing that "houses are built to live in, not to look at, therefore let use be preferred before uniformity, except where both may be had." But he soon shows that he was as much taken as any of his compeers with the idea of symmetry. He admits that you cannot have a perfect palace "except you have two several sides," one for feasts and triumphs, the other for dwelling, but he goes on to say that they should be "uniform without, though severally partitioned within," in which of course he gives away at once his previously-expressed

* "Architecture of the Renaissance in England: illustrated by a series of views and details from buildings erected between the years 1560–1630, with historical and critical text;" by J. Alfred Gotch, F.R.I.B.A., assisted by W. Talbot Browne, A.R.I.B.A. Part I. London; B. T. Batsford; 1891.



Porch to Gate-house, Kenilworth Castle.

Reduced from a plate in Mr. Gotch's "Renaissance Architecture in England."

opinion that houses were built to live in and not to look at. His remark in speaking of the two sides, "I understand these to be not only returns, but parts of the front," does not mean that these two main portions of the house were to be carried round the angle with the same architectural treatment, as he afterwards describes the court behind as consisting of three sides "of far lower buildings than the front." His house is therefore essentially a large state block in front, with wings of inferior dimensions in the rear. In regard to the arrangement of this main block he says:—

"I would have, on the side of the banquet in front, one only goodly room above stairs, of some 40 ft. high, and under it a dressing or preparing place, at times of triumphs. On the other side, which is the household side, I wish it divided at first into a hall and a chapel (with a partition between), both of good state and bigness; and those not to go all the length, but to have at the further end a winter and summer parlour, both fair: and under these rooms a fair and large cellar sunk underground, and likewise some privy kitchens, with butteries, pantries and the like. As for the tower" (he has previously mentioned a tower in the centre of the block as essential) "I would have it two stories, of 18 ft. high apiece above the two wings, and goodly leads upon the top railed in with statues interposed."

The wings of lower buildings at the sides, flanking the inner quadrangle, are to be "all stately galleries" on the state side of the house, "with three or five fine cupolas placed at equal distance, and fine coloured windows of several works." The special requirement of "three or five" cupolas of course refers again to the prevalent idea of symmetry; there must be an uneven number in order to have a centre one and a similar design on each side, and the expression shows emphatically how prevalent was the idea then of the necessity for symmetrical arrangement in every part of a building. On the household side the wing is to contain "chambers of presence and ordinary entertainments," with some bedchambers; "and let all three sides be a double house, without through lights on the sides, that you may have rooms from the sun both for forenoon and afternoon." Bacon had evidently felt the inconvenience of too much sunlight in these large-windowed houses, remarking almost immediately afterwards that "you shall have sometimes fair houses so full of glass that one cannot tell where to become to be out of the cold." (Was he thinking of Hardwick Hall?) The court is not to be paved, "for that striketh up a great heat in summer and much cold in winter," but divided by cross walks into four quarters of grass, "being kept shorn but, not too near shorn." He hardly seems to have appreciated therefore the beauty, in connexion with a symmetrical architecture, of what Milton calls the "smooth-shaven lawn," which as a matter of effect, can hardly to our thinking be kept too neat and close-cut in such a position. He seems to have forgotten again his objection to paving, for in speaking of the further or second court he says "paved as the other court was"; unless he means to imply that it should be formed with cross walks similar to the other court. This second court is to be a cloister court, and surrounded on all sides by the garden, the lower story towards the garden being a place of shade. The rooms in this court are to be of a more private character, and one of them must be for an infirmary, with "anticamera" and "recamera" joining it, "if the prince or any special person be sick" (Bacon always moves among great personages). But we have not yet exhausted our courtyard effects, for we must have no less than three successive courtyards in front of the house, to make a gradual and duly impressive approach: "a green court, plain, with a wall about it; a second court of the same, but more garnished with little turrets or rather embellishments upon the wall; and a third court, to make a square with the front, but not to be built, nor yet enclosed with a naked wall, but enclosed with terraces leaded aloft, and fairly garnished on the three sides, and cloistered on the inside with pillars, and not with arches below." The last sentence is not very plain; we take it to mean that there should be a colonnaded terrace walk some little height above the ground level, and with a solid and not an arcaded basement-wall under it. In such a case the colonnade and basement might range with the basement and part of the columnar decoration of the house, so as to connect it with the whole courtyard, and this idea may have been in Bacon's mind, but he does not make any suggestion of it.

So much for Bacon's practical exemplification of the principle with which he started, that houses were built to live in and not to look at, and which nevertheless seems to admit, in his idea, of an expenditure upon mere adornments and approaches which none

but a Crœsus could realise, and throughout which the idea of complete symmetry of design and laying out is emphasised. And on the whole it must be admitted that for houses on a large scale and in which it is intended to give an impression of palatial dignity, there is nothing like symmetrical design, provided it can be carried out in a rich and sumptuous manner. No doubt a dull, flat, and economical architecture looks doubly dull and flat when treated symmetrically; but where there are the means to realise a fine architectural treatment without stint in regard to cost, nothing is so dignified and stately as a symmetrical design. No doubt, like blue china, it is difficult to live up to; it suggests a kind of semi-palatial and princely order of life, and perhaps therefore should be avoided where there is not the means or the desire to keep up this kind of state. But even on a small scale, symmetry, provided that it is an elegant and not a heavy order of symmetry, will sometimes suffice to raise a small house to an appearance of dignity which it could not otherwise possess. This is very well exemplified in the elevation of Hambleton old Hall, which we have reproduced partly on that account. Apart from its symmetry and the arcade in the centre, this would be just a farmhouse; these features raise it to the rank of a gentleman's house. This little building is an example also of one of the characteristics which Mr. Gotch notes in regard to this early period of the English Renaissance, the combination of the gable with the use of the classic column. In the arcaded parapet is seen a curious reminiscence of Gothic detail, in the use of the triangular sinking in the spandrels of the arches, just as we see it in the interstices of Gothic tracery. It does not harmonise with the rest of the central portion of the building, nor with the use of the keystone to the arch, but it is historically a very interesting bit of detail.

Another of the features to which Mr. Gotch draws special attention is the use of the large mullioned windows along with Classic detail. This feature had sometimes a practical value in enabling the architects of the larger houses in this style to carry out that union of exterior symmetry with varied interior arrangement which, as we have seen, Bacon regarded as one of the desirable qualities in a large mansion. These large mullioned windows enabled the architects on occasion to use the same window design for a single story in one position and for a double story in the corresponding position on the other side of the central feature: a method of treatment sometimes used in large houses of this class, as in Hardwick Hall, and which is quite indefensible on pure architectural principles, and only to be pardoned as an occasional vagary on the part of an architect struggling to combine external symmetry with internal freedom; a combination absolutely illogical and improper, and which can only be regretted as an occasional weakness in an otherwise fine type of domestic architecture.

The finest portion of Burghley House, which forms the first series of illustrations, is the central feature of the courtyard façade (plate 3). The detail of this is curiously incongruous. Three orders are employed in the engaged columns which occur in couples, with niches between them, on each side of the central openings; Roman Doric on the ground story, Ionic in the middle story, and a miniature Corinthian above. The boldness of treatment of the centre is remarkable, with its large semi-circular arch enclosing the doorway, a similar large arch on the first floor, with a deeply shadowed cavity beneath it, against which stands out the bust which is fixed on the centre pedestal of the balustrade. On the third story the slightly projecting mullioned bay-window appears to be an interloper from a different world of architecture. The square mass of the centre turret with its lofty pyramidal spire seems rather to crush this window. At the sides the smaller pyramids, with their curious inverted scrolls at the base, cut through so as to leave an opening against the sky, are almost grotesque in taste, but the bold manner in which they are connected with the central feature by the colossal conventional heraldic lions is very fine. In the same view are seen two of the curiously-formed and utterly inexcusable chimneys, formed of coupled columns with a piece of architrave laid across them, which in turn carries the chimney-pots, the columns being apparently hollowed as flues. Taken by itself this is as bad a piece of detail as could be found: but when seen at a little distance on the approach to the house these features assist in giving it that remarkably picturesque and multitudinous effect of skyline which is the first thing that strikes one in the building; and which, however Classic some of the details may be, is in its *ensemble* much more Gothic than Classic in feeling. Where three or four of these columnar flues are combined together they look rather better than the coupled ones, and at a sufficient distance one does not realise exactly what the detail is which has been so much misapplied. The west front of the house, with its octagonal turrets and cupola terminations, is far more Mediæval than Renaissance in general appearance; indeed with the exception of the curious balustrade with its little obelisks on pedestals between the open arches, there is not a Renaissance detail in it. The most singular incident in the architecture is the sloping downward of the strings over the first-floor windows on the north front, from the centre to the angle, the window heads being gradually lowered with them. The author merely draws attention to this peculiarity, without suggesting any explanation of it. It is obviously an unintentional feature, probably the result of some carelessness in the setting-out of the heights on the west front, which were found not to correspond on the upper story with those of the central feature of the north front, and this rather clumsy way was adopted of rectifying the error.

Hardwick Hall, as Mr. Gotch says of it, is a flat tame uninteresting building, characterised by a series of very large windows, all nearly alike and all bald in design and destitute of cornices or other architectural embellishment. The boundary-wall of the enclosure, which is seen in the foreground of the view, is interesting in relation to a remark in Bacon's essay. We have already suggested that possibly Hardwick Hall gave rise to his complaint about the superabundance of windows in some great houses. The series of ornamental features on the coping of this wall exactly answer to Bacon's description of the second court of entry to his imaginary mansion, "garnished with little turrets, or rather embellishments on the wall;" the sentence might have been written as a description of it.

The claims of Haddon Hall to be classed among Renaissance buildings are barely apparent on its exterior, at least on the garden front which forms the first illustration, and it is curious to compare this with the almost entirely Renaissance style of the wainscotting of the Long Gallery, which is the subject of the next plate. The Gothic spirit still asserts itself in the plastered ceiling with its tracery design, but in regard to the woodwork the interval between designing the exterior and fitting the interior was evidently sufficiently long for the Gothic spirit to be laid and the Renaissance to take its place. Park Hall is again a curious mingling of Gothic feeling with bits of Renaissance detail, shown chiefly in the Ionic capitals to the wooden pilasters, and in the shape of some of the flat uprights of the black and white work, which resemble the silhouette of a baluster. Between the Ionic-headed pilasters the spaces are occupied by quatrefoils in black and white, as nearly Gothic as possible. Apethorpe Hall (pronounced Apthorp) has the singularity, in the court-yard view, of appearing much more Renaissance in the ground-story than in the upper portion, the ground-story consisting of a rounded arcade on columns and with keystones, and an entablature over the arcade, the upper stories having square-headed mullioned windows, which however are just classicised a little by the piece of entablature inserted over them and the fluted ornament in its frieze. How often this combination of a Classic entablature in ground-story and mullioned windows over it has been imitated in recent architecture it is unnecessary to observe; it is a combination rather piquant in itself and which has taken the fancy of the present generation of architects, who are now disposed to act over again the mixture of styles which in the sixteenth century arose naturally out of the then circumstances. This imitation will probably not have any more lasting influence than other imitations; it is something new for the moment, no doubt, and gives a pleasantly old-fashioned look to a new building. Stibbington Hall is chiefly noticeable for its curious gateway, with an open gable of reflex curve (as if the walling had been taken away and only the coping left), enclosing an open circle within it. It is not beautiful, and it is to be hoped no one will try for "originality" by copying it, but it is an interesting relic of the architectural fancies indulged in at this period.

It must be admitted that the letterpress of the book is rather meagre, and that the author seems to have thought it sufficient to give a few remarks as to the date of each building and one or two of its peculiarities, without going further into its history. This is to be regretted, because Mr. Gotch has the capacity to write very well and picturesquely on subjects of this kind, and he would have added to the popular value and interest of his book in giving full literary descriptions of the buildings. As it is, we do not very well understand whether the book is intended for architects or for the general public. If for architects, it is deficient in plans and measured drawings; and even in regard to the views we must confess that we prefer drawings to photographs, provided they are accompanied with a sufficiency of measured details; there is a separate interest in drawings for their own sake, arising out of the style and feeling in their execution, which does not belong to a photograph. Where measured details are but sparingly given, no doubt a photograph, when reproduced by a process which leaves the detail clearly defined, is the method which can be best trusted to give all the detail as accurately as the scale will allow. But a series of photographs, with a few words of explanation to each, is not all which used to be looked for in a large illustrative work on architecture. Times are changed, and books we presume must be produced more quickly as the age moves quicker; but they cannot in that case have the monumental value which attached to some of the typical architectural illustration books of the previous generation, such as Sharpe's "Parallels" and Bowman and Crowther's "Churches," and others that some of our readers will recall.

THE NEW INTERPRETATION OF THE EAST FRIEZE OF THE TEMPLE OF NIKÈ APTEROS AT ATHENS.



THE east frieze of the Nikè temple has long remained an unsolved problem,—a problem, too, of which archæologists were confessedly a little weary, and which they had allowed to fall into temporary abeyance. And yet the marbles are in fair preservation; twenty-four figures, every one of which has left substantial traces, still tempt conjecture.

As so often happens in such cases, it is not the actual monument itself that has prompted a fresh suggestion. Dr. Bruno Sauer has been led to his new interpretation by a study of a well-known terra-cotta plaque in the Smyrna Museum. This plaque has usually been held,—though the view has always been beset with difficulties,—to represent the strife between Athene and



East Frieze of the Temple of Nikè Apteros.

Poseidon for the dominion of Athens,—the contest being decided by voting. Dr. Sauer holds that the scene represented is the decision of the gods between Asia and Hellas. Further, he believes the terra-cotta to be only an excerpt from a larger composition representing the same scene, and this composition he believes to have been the east frieze of the Nikè temple. How fitly such a subject would adorn the little temple that crowns and guards the Acropolis approach need scarcely be pointed out.

The details of the interpretation will best be followed by reference to the accompanying wood-cut, and indeed it is only by a careful examination of the composition of the frieze and the balance of its various parts that the necessary conditions of any just interpretation can be realised. The two principal figures (13 and 16), manifestly important divinities, are seated near, but not precisely at the centre, between them is a standing woman, figure 14. To the right five (17-21), to the left four (9-12) figures are standing in repose, and evidently in conjunction with the seated ones. Among these quiet standing figures, one in each group (10 and 19), is distinguished from the rest by superior majesty and dignity of pose. At the extreme left are three quiet figures grouped together (1-3). Moving towards the centre, three in rapid motion (4-6) of the corresponding figures to the right. Only one of these in motion (24) is preserved. On the left a definite *cæsura* divides the three figures moving towards the centre from a seated one (7), with a standing figure near her (8), and this pair are again, though less markedly, divided from the middle figures. In this last respect left and right balance, but when it comes to the seated and standing pair on the right two things are noticeable: first the group of two on the right are in action, not quiet like that on the left, and second, the *cæsura* noticeable on the left has quite disappeared on the right.

Returning to the centre group, it is of the first importance to note that the middle front is occupied, not by any figure, but by the junction of the two slabs. Immediately to the right of this, and balancing the standing figure Athene (14), are the remains of some vertical supports, which have been usually taken to be human legs, and accordingly explained as either Pan or Ganymede. A close examination proves that they are too square to be human, and that, in fact, they are nothing more (as is evident from comparison with similar objects on coins) than the vertical supports of a table shown in perspective—a table similar to that seen in the Smyrna terra-cotta.

We have, then, an assembly of the gods, and a table in the most prominent position. Comparing the scene with the Smyrna relief, it is evident we have some ceremony of voting in the presence of the gods. The figures 13, 14, and 16 are Poseidon, Athene, and Zeus, but they do not fix the subject of the controversy; for that, Dr. Sauer thinks, we must refer to the seated woman figure (23). The figure is undoubtedly characterised in the most marked fashion,—as in deep sorrow and anxiety, with drooping body and sunken head. Clearly she has every reason to be concerned in the issue of the voting. Her counterpart (7), though much mutilated, can yet be made out as sitting erect, and apparently fearless. The voting is clearly not between two rivals for possession, but between accused and accuser, as in the case of Orestes; the figure 23 is the accused. The meaning of such a scene, represented on the Nikè temple, would be obscure enough but for the design on the well-known "Persian" Lower Italy vase. There Asia, seated aloft, challenges Hellas, who is sorely beset and troubled, but sustained by the support of Zeus, Athene, and Nikè. The scene on frieze and vase alike is, of course, supposed to take place *before* the first Persian war. It is throughout conceived on the lines of an Attic law-suit,—accuser and accused when not pleading are seated. Zeus, who has instituted the suit, presides conjointly with Poseidon. Athene is counsel (*συνήγορος*) for the accused Hellas, and she, with the table that holds the voting urn, occupies the centre. The figures in motion are also intelligible on this supposition. The maiden (figure 22) plays the part of court messenger, summoning the other maiden (24) as witness on the part of the accused.

The remaining figures can be named with, at least, considerable probability. No. 18 is unquestionably, from the remains of goat-legs, Pan, who played so prominent a part as ally of the Athenians. He is balanced by (11) Theseus, a figure familiar in this relation from Mikon's Marathonomachia. Aphrodite (3), with Eros (2), and Peitho (1) stand to the extreme left as disinterested spectators. The stately woman-figure (17) immediately behind Zeus must be Hera, balanced by (12) Amphitrite behind Poseidon. The two closely-united figures, 20 and 21, can scarcely be other than Demeter and Korè. It is probably not by accident that the central groups of quiet figures judging the cause are twelve, and yet clearly, if Theseus and Pan are present, they cannot be the twelve orthodox Olympians. This is important when we come to decide the attribution of the two imposing women-figures 10 and 19. In connexion with these two figures, it should be noted that in the Smyrna terra-cotta of all the twelve judges, only two remain—Athene and Poseidon, and these as the representatives of the two dominions of land and sea. It does not, therefore, seem too bold to call the two majestic women figures, Gaia and Thalassa, the impersonations of Land and Sea, standing here as opponents, not as in the East pediment, united into one group. Thalassa is well in place (10) on the side of Poseidon, and near to Theseus (11), Poseidon's son. Given this attribution, and it is natural to call the mature male figure (9) Aigeus, whose story was so closely linked with the Nikè temple, and whose Heroon stood just below. Gaia also on the land side (19) is well in place between Pan and Demeter, and Korè and her figure is strikingly like that of the statue now explained as Gaia Kourotrophos in the Acropolis Museum.

It may possibly be felt by some that so realistic a representation of a law-court scene is inartistic; this, however, is surely a modern rather than an ancient objection. The law-court scene in the Eumenides is no less precise in its realistic scenery, yet no one feels it is unpoetical. The issues were large enough to redeem the contest from all pettiness:

> "Too well, too well was the great stake worth
> The strife divine for the gods to judge."

THE PANAMA CANAL.—The reconstituted Panama Canal Company has succeeded in concluding a new agreement with the Republic of Colombia respecting the Canal works. The time for the completion of the Canal is extended to the year 2000, but effective work on the Canal is to have commenced by February 28, 1893. The assets of the old company, including machinery, &c., are to be transferred to the new one, which will also wind up the old concern. In return for these concessions, the Colombian Government is to receive £400,000 in gold and £200,000 in Canal shares, with the right of having a representative on the Board.

NOTES.

THE announcement that the Government has decided to issue a Royal Commission to inquire into the relations of capital and labour has been received with much satisfaction in many quarters. It will, no doubt, be useful to Conservative speakers at the General Election: it will be paraded as showing the interest which the Government takes in the well-being of the artisan class. But it is difficult to see what practical result can follow from the report of the Commission. It will give much interesting information to the public, but it cannot produce a panacea for the disputes between employers and employed. Should a State Board of Conciliation be established? The country and Parliament can decide this question just as well now as when a Royal Commission has reported. The appointment of such a Commission is also liable to create hopes which cannot be realised, and may, in fact, do more harm than good.

THE conclusion of the House of Commons to refer the London Water Commission Bill to a Select Committee was the best that could have been come to, provided that the other Bills to be brought forward in relation to London water supply be treated in the same manner and referred to the same Committee, as they probably will be. The subject is far too large and important to be dealt with hastily or without the fullest investigation. The debate was marked, we are glad to see, by a generally reasonable and judicious tone in the main, and it is satisfactory to find more than one prominent member of the House supporting the view, which we believe is the only practical one, that the London County Council is the proper body to have control of the water supply. The appointment of a new and separate public body to deal with it is both unnecessary and likely to prove inconvenient, as well as expensive.

IT is a pity that the Cheap Trains (London) Bill was not defeated by a larger majority than the 19 recorded. As Sir J. Pease said, the Bill really represented the kind of philanthropy which consisted in A saying that B ought to hand over something to C. It appears that as a fact some of the railway companies now provide workmen's trains at a cheaper rate than this Bill demanded. That depends of course on the nature of the traffic of the railway and on the districts which it serves. To mark out an area round London within which all railway companies should be compelled to carry workmen at a rate unremunerative to many of them would in the end only lead to an extension of London to the limits of that area, and to a most inconvenient and dangerous swamping of other classes of railway traffic.

IN Berlin, and in its artist circles especially, the two main topics of conversation are the Raschdorff Cathedral design and the International Art Exhibition. The latter has now a certain amount of political importance attached to it, since the Emperor seems to wish to commence friendly relations with France on a basis of mutual art interests, and since the steps taken by him on the occasion of Meissonier's death, and lately again at the French Ambassador's dinner, are likely to have the result he aims at. The reply from the Paris Academy to the Emperor's letter of condolence was couched in the most agreeable terms, and a few days after the

Ambassador's dinner one heard of the formation of a Paris Committee, including names such as those of Détaille, L'Hermitte, Bougereau, Cazin, &c., for the arrangement of the Exhibition contributions. The delegate of this committee has been to Berlin; the Berlin Managing Committee has put one of its best halls at the disposal of French exhibitors, and judging from the names already entered this group promises to be a representative one.* England seems to have elected Professor A. Lutteroth, of Hamburg, to manage the arrangement of its group, and the Professor's long list of names contains among others already those of Sir F. Leighton, Millais, G. F. Watts, Pettie, Henry Moore, Wimperis, Th. Collier, Alma Tadema, Walter Crane, Orrock, Marcus Stone, Ford, Simonds, Gilbert, Thornycroft, &c. The Italian delegate's list is a still longer one, and includes loan pictures from the Roman National Gallery. Belgium, Holland, and Spain, will be well represented, and as to Austria, we hear that the Managing Committee are already at a loss to know where the unexpectedly large number of exhibits for this group are to be hung. It may be advisable to state that although, as stated in our last number, the time of delivery for would-be exhibits is from March 14 till April 10, that it is customary, and in the interests of both exhibitor and Exhibition Committee, that a notification as to the size of the work to be presented for admission be made to the delegate† as soon as possible. In reference to the Architectural Division of the Exhibition, which, by the bye, is to be the forerunner of the International Architectural Exhibition to be held at Berlin, 1896, we hear that the committee of architects in charge have now unofficially made known their wish to prevent the admission of architectural exhibits in the form of photographs. Photography is only recommended as a practical means of reducing plans to a more convenient size for exhibition purposes.

THE latest number of the Athenian *Mittheilungen* of the German Archæological Institute (xv., 4) is chiefly taken up by the long-delayed report of the discoveries at the temple of the Kabeiroi, near Thebes. Two years ago (No. xiii., p. 412) the vases discovered were discussed, and in part published. The present number deals with the terra-cottas, bronzes, and inscriptions. In striking contrast to the vases, the terra-cottas which have been found by thousands present no especial local characteristics; they are similar to those found everywhere in Bœotia and Locri,—the same type occurs in endless repetition, *e.g.*, there are 250 sheep, 200 pigs, 25 recumbent lions, 30 seated lions; the goat-legged Pan occurs 25 times. After the remarkable interest of the vases, it must be confessed that the remainder of the find is somewhat disappointing, though the inscriptions—many of which are reproduced in facsimile—will be full of interest for the specialist in epigraphy. The report is the joint work of Drs. Tzanto, Graef, and Wolters. To the same number Dr. Dörpfeld contributes a paper on the now famous inscription published by Lölling (Δελτιον 1890, p. 92), in relation to the early Athene Temple of the Acropolis. This inscription, found in a number of fragments and skilfully put together by Dr. Lölling, yields the following substantial additions to our knowledge of the temple in question. We learn from it that in the 6th century B.C., the whole building went by the name of the Hecatompedon—further, that its back portion served as a treasury, and consisted of several chambers. The further question arises and is answered in the affirmative by Dr. Lölling, Did the temple continue to hold its name of Hecatompedon after the building of the Parthenon? Dr. Dörpfeld thinks not; he holds that after the building of the Parthenon the old temple was called ὁ ἀγχαῖος or ὁ παλαιὸς νεως, and the name Hecatompedon was transferred to the cella of the new temple, which was in itself exactly 100 ft. long. This view he supports in detail by arguments turning mainly on the general disposition of the new temple, the name of its various parts, and the notice we have of the treasures stored in these several departments. In the general report, which concludes the number, hope is held out that the topography of the Athenian agora may before long be established. The Peiraeus railway is to be extended, and will pass under the present "Athena" street. This will involve the pulling down of many modern houses, and the line must cross the ancient road that led from the Dipylon to the agora. It will be hard if the excavators do not come on some ancient remains of topographical importance.

AT the last meeting of the Hellenic Society on Monday afternoon, when there was an unusually large attendance, Mr. Ernest Gardner read a very interesting and judicious paper on Dr. Schliemann's life and works, giving full value to all that Schliemann did for archæology, but without crediting him with all the discoveries which he claimed, or losing sight of the fact that he was a very fanciful and imaginative explorer, and too ready to believe he had found what he wished to find. Professor Gardner declined to give the name of "Troy" to Hissarlik; the Troy of Homer, he said, was built in the same country as the Camelot of the Arthurian legends, and its relics would not be discovered by any delving in material soil; but that did not lessen the archæological value of what Schliemann actually did find there. Mr. H. W. Schultz then read a long and learned discussion on the north doorway of the Erechtheion, showing that it was probably not contemporary with the rest of the building. The substance of this paper had been before given in the form of a lecture to the British School at Athens, and a résumé of it was given in the *Builder* of March 22 of last year (page 208). There can, we think, be very little question that Mr. Schultz is right in his conclusions, but the reasoning must have been quite unintelligible to the majority of the audience on Monday for want of any illustrations such as could be seen and referred to by them as the paper proceeded. This is a constant cause of complaint at the meetings of the Hellenic Society, where papers are read the comprehension of which depends entirely on illustrations, and none are forthcoming except perhaps a small sketch or photograph which is laid upon the table where no one can see it, and the listeners are expected patiently to follow the references to what they cannot see. Once or twice we have seen duplicated illustrations handed round, but this is an unusual grace. The Council of the Hellenic Society ought to see to this, and to exhort readers of papers to provide the audience with intelligible illustrations, and to provide themselves a screen on which to hang them, and a black-board on which a lecturer could make a graphic demonstration of his subject when necessary. For want of any effort, apparently, to make such provision, many of the papers read at the Hellenic Society's meetings are entirely thrown away, and people are induced to waste their time in listening to views which it is impossible for them to understand or follow out for want of adequate illustration.

IN the last number of the *Jahrbuch* of the German Archæological Institute there appears a criticism by Dr. Furtwängler on the report of the excavations carried on by Messrs. J. A. R. Munro and H. A. Tubbs in 1889 at Polis-les-Chrysochon, in Cyprus, for the Cyprus Exploration Fund, and which was published in the *Hellenic Journal* of last year. This criticism practically resolves itself into an attack on the sufficiency of the training of British archæologists and their competence for undertaking work of this kind. Dr. Furtwangler attacks our scholars with some vehemence, and supports his charge by what he calls "quotations" from their report. Unfortunately, of the two passages cited one is a short phrase picked out from the middle of a sentence, and, robbed of its context, it amounts to a *suggestio falsi* on the part of the critic; the other is the exact reverse of its professed original. Dr. Furtwängler is as unfortunate in the remainder of his strictures as in his manner of uttering them. It is true that the new material furnished by the excavations agrees but ill with earlier theories like those of Dr. Furtwängler; still, it is an amusing instance of the way in which a pet prejudice will bias even clever men, that the German critic, besides making a serious misquotation, should try to prove that a fact is not a fact by first assuming it to be unreal, and then, on his own assumption, discrediting the character of the author from whom it is quoted. Dr. Furtwängler believes that a certain class of pottery was manufactured only at an early period. The excavators state that they have found it accompanying other kinds of pottery and miscellaneous objects which Dr. Furtwängler considers of a later epoch. *Therefore*, concludes our critic, the excavators are "deficient in archæological training," and he expresses a wish that in future the Cyprus Committee will send out more competent men. Such a method of argument hardly requires comment.

MR. EWAN CHRISTIAN has addressed a letter to the *Times* of Tuesday in deprecation of any proposition to remove Hanover-square Chapel, Regent-street, a subject to which we have already called attention. Of course if the chapel is no longer required for public worship in its present position it would be difficult to make out any practical case for retaining it. On that point we have no information. But it would be much to be lamented if Regent-street were to be wantonly shorn of what may be said to be the only piece of real architecture in the street; and that too the design of a man who, both in regard to character and ability, was an honour to English architecture.

THE small town of Wells-next-the-Sea, so called apparently because it is a mile and a-half from the sea, and only connected with it by a narrow channel, has been occupying the attention of the Local Government Board, and Mr. Spear has reported on its condition, which seems rather primitive, though the health of the place seems better than might have been expected under the circumstances.

"In the drainage of the town advantage has been taken of the natural contour of the ground already described. Some two-thirds of it drain northwards by sewers which open into the sea channel, or, as on the western extremity, into a dyke, which itself later discharges into the channel. The remaining third, or southern portion of the town, is drained in an opposite direction, the sewers here discharging into what is described in old maps as "the old public drain." This latter, which probably marks the bed of an ancient watercourse, has now, throughout the greater part of its length, been culverted; it discharges into a dyke which, after a circuitous course through the marshes, finds an outlet into the sea channel. In the dyke on the western extremity of the district, before spoken of, as also in the unculverted portion of the "old public drain," sewage stagnates to some extent so as to cause a nuisance. The attention of the authority is now being directed to this matter.

The sewers of the town consist partly of old brick culverts and partly of socketed pipes of more modern construction. Man-holes and surface ventilators have not been provided, but the gradients are said to be good, and the sewers consequently fairly free from deposit. Flushing, when required, is effected through the roadside gullies. Ventilation, if so it may be called, is imperfectly provided for by the rain-water spouts of houses only. The drain connexions on private premises are often imperfect; in many cases drains are of the old, rough brickwork, while yard-gullies are in many cases untrapped, or still more often protected by the bell-trap only. There are very few, if any, water-closets connected with the public sewers."

The town has been the paradise of privy pits, the majority of the old deep ones being now done away with, and their place taken by

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* Unfortunately since this was written there seems to have been rather a reaction in the French capital against the idea.

† We repeat the address of Herr Jobelmann, from whom detailed particulars of the Exhibition regulations, &c., can be had: Wilhelm Strasse 92, Berlin, W. Letters to the English delegate should be addressed to Prof. A. Lutteroth, Uhlenhorst, Hamburg. Special particulars of the Architectural Division can be had from Prof. F. Wolff, Schelling Strasse 15, Berlin, W.

cemented pits "believed to be watertight," and which are only sunk a few inches below the ground. This is an important point, certainly, where all the water is obtained from wells, of which the town is full.

"Pure water was hardly to be expected from shallow wells sunk in a soil that had been occupied by human beings for ages, in yards that were often unpaved and very close to privies and drains which have only in recent years, if even now, been made water-tight, and analysis confirms this view. Samples of water, taken from wells on the south, in the centre, and on the north of the town, were sent to Dr. Frankland for analysis, and are all classed by him as 'dangerous.' The question of providing Wells with a general water service is one that has not yet been seriously considered by the authority; although the practicability of sinking a public well at the higher central and open part, near the 'Butt Lands,' lifting the water to a tank tower, and thence distributing it by gravitation, has been informally spoken of."

In the meantime, in spite of general good health, one decided outbreak of typhoid has occurred, and the original focus of this has been established as in the neighbourhood of a well, afterwards found to be polluted, among the people using its water. We should advise Wells-next-the-Sea not to postpone practical steps towards procuring a new and pure water supply.

SEVERAL interesting scientific papers will be found in the journal of the Franklin Institution, published last month. A graphical method of determining the stresses in continuous girders is described by Mr. C. H. Lindenberger, who also considers the effect of the moment of inertia not being constant throughout the beam, a condition which materially increases the difficulty of the subject. Mr. L. d'Auria gives some facts relating to his former article on the force and impact of waves and the stability of the superstructure of breakwaters, and in addition to these papers there are others on "Photography in the colours of Nature," and "Electricity, its past, present, and future," besides those which are contributed to the chemical section.

THE exhibition at the Burlington Fine Arts Club, illustrating "the French revival of etching," as might be expected from its title, is of exceptional interest in regard to the quality of the works exhibited, though their number is not very great. The collection includes, however, a very representative selection of the etchings of Méryon,—a considerable proportion of which consist of those half-weird representations of old Paris in its mingled griminess and picturesqueness, about which seem to hang such memories of violence and crime. The "Stryge" of course is there, two impressions; and the drawing of the old Morgue, which a great English poet has celebrated in his own powerful and original fashion, and "St. Étienne du Mont," showing white between the masses of houses in deep shadow; and the remarkable picture of "Part of the City of Paris" (34), a scene with a whole chapter of history expressed in its grim squalor. There is a drawing of the old "Pont au Change" (31) with the houses crowded on it, as described in our recent article on the Paris Bridges (page 121-2 *ante*). The "Rue de Mauvais Garçons" (17) is another of these gloomy corners which seem to have had a strange fascination for Méryon. The "Galerie de Notre Dame" (16), in the interior of the tower, is a fine architectural subject of more everyday character. Millet is represented by eleven etchings, some of which are very coarse in execution, but nearly all have a value of their own, the finest is perhaps "Les Glaneuses"; "La Grande Bergère" is a remarkable treatment of a figure almost entirely in shadow. The splendid collection of Jacquemart's work carries us to the opposite pole of etching, the use of the most careful and refined execution in the illustration of plate, armour, drinking-vessels, &c. The brilliant manner in which this class of objects is represented by a method which might at first sight seem quite unsuited for such work is remarkable; notice especially the "Vase Antique" (46), the "Patine du Calice de Suger" (47) the "Vase Antique" (49) with a whole landscape reflected in it, the reflection following the sinuosities of the surface. It is not surprising to read that Jacquemart made full studies of these works in pen-and-ink or water-colour before commencing the etching; he could hardly have attained such certainty of effect otherwise. Bracquemond is the only living artist represented; his "Margot la Critique," a magpie standing on the globe and trampling literature and art under its claws, is a piece of vitriolic satire, showing also great spirit of execution, but Bracquemond is too much given to ugly and eccentric subjects. Of three very rough etchings by Corot, one shows a remarkable degree of aërial effect for so few lines. The only etching known to have been executed by Ingres, a portrait, forms part of the collection, which concludes with three of Meissonier's diminutive marvels of work. It is curious to contrast these with Millet's etchings on the next wall. The triumph of execution is all with Meissonier, but Millet goes far beyond him in feeling.

THE members of the Royal Academy, and their secretary, we presume never look at the calendar when they advertise the days for receiving works for their annual exhibition; or if they do, they appear to wantonly disregard both the customs of this country and the convenience of outside exhibitors. They have announced as the receiving days for paintings this year, Friday, Saturday, and Monday, the 27th, 28th, and 30th of March. The 27th is Good Friday, kept by the mass of the people as a holiday, and by a minority (more fittingly) as a sacred day; the 30th is a Bank Holiday, and the Saturday coming between these is almost everywhere kept as a holiday. Where are artists sending in pictures to find cartage and porterage on those days? Or why is the Bank Holiday of the employés of the picture agents, and of those of the Academy too, to be broken into, because the Council cannot take the trouble to inform themselves of the times and seasons? The arrangement of course does not affect the convenience of the Academicians, who have the indulgence of sending in their works a week later.

BYZANTINE ARCHITECTURE.*

BY PROFESSOR AITCHISON.

Byzantine Decoration.

WHEN Constantine the Great made Byzantium the capital of the Empire, Roman buildings were reproduced as well as they could be in a foreign town, and the decoration of them was that which was prevalent at Rome. We are too apt to think of Rome as a mud-built city with a few temples and public buildings of terra-cotta or stone, and the Romans as the simple and severe people of the early days of the Republic, when the great Generals lived in small farm-houses, wore a white toga, and tilled their land with their own hands. Just before the Punic wars (264-146 B.C.) there was but one service of public plate, which was lent to each Senator when he entertained foreign Ambassadors. You may recollect the remark of the Carthaginian Ambassador "that the Romans were the most good-natured people in the world, for though he had dined with each Senator separately he always saw the same service of plate." The influx of wealth, and the acquaintance with the magnificence and luxury of Greece, and of Oriental despots, very rapidly introduced the customs of Greece, Persia, and Egypt into Rome. Marble, which was at first looked on as a scandalous luxury for a private person, soon became the favourite lining of walls, though, so late as the first century B.C., M. Brutus called Crassus the "Palatine Venus" for having six columns of Hymettian marble in his house.

Sulla is said to have been the introducer of mosaic pavement, between 88 and 78 B.C., though his son-in-law Scaurus had, before that date, used glass for one of the stories of his temporary theatre. Personal adornment kept pace with the magnificence of houses, for Julius Cæsar had his shoes enriched with engraved gems! We know of the costly citron-wood tables of Cicero, and the gold and ivory ceilings of Horace's time. In the days of Augustus, an edict had to be promulgated to restrict senators to the use of the white toga on festal days. Seneca thundered against the luxuriousness of the baths, with their costly marble walls, their floors of gems, and their fittings of silver. Pliny, who died 79 A.D., wrote his diatribes against veneering walls with marble; and he tells us that mosaic had deserted the floors for the ceilings of rooms. Stained glass must, I think, have given additional splendour to buildings at an early period of the Empire. Even in Pliny's days, costliness was more admired than art, so that in magnificence and splendour the Byzantines could not exceed, but could only rival the Romans. Rome has been stripped so bare that we might fancy it to have been a plain city, but for written descriptions. There was, however, an invention that must have rendered the splendour of gold and silver much less costly, and, therefore, much more common at Constantinople, I mean the invention of gold and silver mosaic; the absolute date of its invention is, I believe, unknown. I may say that I did not find a single cube of it at Hadrian's Villa, nor in Caracalla's Baths, and these baths were not built till the third century. It is probable that gold and silver mosaic preceded those medallions, in which an etching on gold-leaf is preserved between two sheets of glass; these medallions, having portraits or symbols etched on them, bear evidence of their being of Christian times, so antiquarians believe them to be no earlier than the end of the third, or the beginning of the fourth, century. Specimens of the glass medallions may be seen in our national collections. Gold and silver mosaic is believed to have been used in Constantine's days, but I know not on what ground; the finding them in buildings of his day is no proof, unless it be confirmed by documentary evidence, and there is little or no evidence of the buildings in which they are found being of his time. There is a mosaic portrait of Flavius Julius Julianus in the Chigi Library that has several cubes of gold mosaic in the dress. It was found in the catacombs of St. Cyriaca in the Tiburtina, in 1656, and is believed to be of the second half of the fourth century; but there is nothing to prove that the gold mosaic cubes were not of a subsequent date. The passion for using metals, and particularly the precious ones, for decoration, seems to be inherent in man, and only to be interrupted when men or nations are wealthy, at periods of the highest cultivation. In the Bronze age, we read of the metal palace of Alcinous: "Meanwhile Odysseus went to the famous palace of Alcinous, and his heart was full of many thoughts as he stood there or ever he had reached the threshold of bronze. For there was a gleam as it were of sun or moon through the high-roofed hall of the great-hearted Alcinous. Brazen were the walls which ran this way and that from the threshold to the inmost chamber, and round them was a frieze of blue, and golden were the doors that closed in the good house. Silver were the door-posts that were set on the brazen threshold, and silver the lintel thereupon, and the hook of the door was of gold. And on either side stood golden hounds and silver, which Hephæstus wrought by his cunning, to guard the palace of great-hearted Alcinous, being free from death and age all their days . . . . Yea, and there were youths fashioned in gold, standing on firm-set bases, with flaming torches in their hands, giving light through the night to the feasters in the palace" (the Odyssey of Homer Lib. 7, lines 80 to 102, by Butcher and Lang. 8vo. London. 1887.)

It is not very clear whether the whole of the inside of Solomon's Temple was covered with gold, or only the oracle (I Kings, cap. 6, v. 20, 21, 22); but Polybius tells us that the palace at Ecbatana was covered with gold and silver (Lib. 10, cap. 27). "For all its woodwork being cedar or cypress not a single plank was left uncovered; beams and fretwork in the ceilings, and columns in the arcades and peristyle, were overlaid with plates of silver or gold, while all the tiles were of silver."

Suetonius tells us that Nero's Golden House had some parts overlaid with gold, and adorned with jewels and mother-o'-pearl. "The supper-rooms were vaulted, and compartments of the ceilings, inlaid with ivory, were made to revolve, and scatter flowers" (Suet. "Nero," cap. 31). Constantine Porphyrogenitus tells us

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that his grandfather, Basil the Macedonian (867-886), built an oratory to the Saviour (No. 139) close to his apartment (Cenourgion) in the Sacred Palace, and says:—"The magnificence and splendour of this oratory are incredible to those who have not seen it, so great is the quantity of gold, of silver, of precious stones and pearls which are found amassed in its enclosure. The pavement is wholly of massive silver, worked with the hammer and enriched with nielli. The walls to the right and left are also covered with thick plates of silver damascened with gold, and heightened by the brilliancy of precious stones and pearls. As to the screen which closes the sanctuary in this house of God, what riches does it not combine! The columns are of silver, as well as the plinth that carries them. The architrave which rests on their capitals is of pure gold, loaded in every part with those riches which the whole of India can offer. One sees there, in many places, the image of our Lord, the God-man, executed in enamel. Language refuses its office to describe the splendid decorations of the sanctuary, and the sacred vases which it contains, as a place especially appropriated to the keeping of the treasures, and desires to leave them as things which nothing can approach; for, since speech can only remain below the subject, it is better to be silent. Behold, then, if I may say so, these Oriental beauties, which have gushed out from the bosom of the living faith of the illustrious Emperor Basil on to the works raised by his hands in the Imperial residence."

I have no doubt that the palaces built of gold and silver bricks, and covered with jewels, described in the Arabian Nights, were suggested by some of the splendid rooms or oratories of the Byzantine emperors. The means of decoration being metal, marble, sculpture, mosaic, and painting, I will now take the carving and marble. There was in the Early Christian Church a marked aversion to the use of figure sculpture in whole relief, and to statuary in churches, on account of the pagan idols being mostly in that form, but bas-relief did not seem to have been so much objected to. At first, too, there was an inclination to represent the Founder of the Faith by means of symbols, such as the lamb or the fish; but remains of angels carved in relief are found at Qalb-Louzeh, and there are figures in the caps of the columns of the narthex at "The Monastery-in-the-Country." Generally speaking, capitals of columns are carved with floral ornament only, except in the case of old Pagan caps, on which there are animals. The Mussulmans seem also to have had an aversion to figures in sacred buildings, as conducive to idolatry, so what with the original objection to figures by the Christians, the fury of the Iconoclasts and the puritanism of the Mussulmans, little figure sculpture is found in the Eastern Churches. This must have been a severe trial to the sculptors who had turned Christian, and who were surrounded by the masterpieces of ancient sculpture and statuary, though Constantine had all the fountains he built carved with these two subjects, viz., "Daniel in the lion's den," and "The Good Shepherd." Sculpture for secular purposes was still used in Justinian's time, for Procopius tells us that the sculptors and statuaries of Justinian's days produced such excellent statues that they might be taken for the work of "Phidias, the Athenian, of Lysippus of Sicyon, or of Praxiteles." He tells us of the bronze equestrian statue of Justinian in the Augusteum, and one of the Empress Theodora, in the court of the baths of Arcadius; he says:—"The face of the statue of Theodora is beautiful, but falls short of the beauty of the Empress, since it is utterly impossible for any mere human workman to express her loveliness, or to imitate it in a statue." I presume the sculptors eventually turned ivory carvers, for in this material figures do not appear to have been objected to. The capitals of the columns, when not pillaged from ancient buildings, generally affected the cubic form, like those of Constantine's cistern, called the Thousand and One Columns (see photo), or that of the plan of a Corinthian cap, with a convex instead of a concave outline; the whole capital was generally covered with fine pierced floral ornament. There was a great inclination, even in late Roman days, to make all floral sculpture like filigree work.

A few well-known examples of capitals are exhibited. The plan of decoration was, as I have said, practically the same as the later decoration of Rome; the columns were of choice marble monoliths, with carved capitals; the walls were lined with thin slabs of various coloured marbles, mostly arranged in panels with borders. Sometimes the borders, and sometimes the panels, were carved with flat carving; and sometimes the borders, and sometimes the panels, were of inlaid marbles, now called "pietra dura." There were carved cornices, strings, door, and window heads, while the vaults, arches, and domes were covered with mosaic. The marble linings have been stripped from the walls of Roman buildings, and it is only here and there that we find a bit of marble in an angle, held on by a clamp, or by the floor mosaic. Monolithic shafts, and their carved caps we still find; we also find floor mosaics, on account of their being covered by the rubbish when buildings were pulled down, or fell down after they were abandoned; of glass mosaic we find nothing but the cubes amongst the rubbish, excepting a few coarse rustic works like the faces of fountains at Pompeii. But Rome had been stripped when the capital was changed to Constantinople, and again when paganism had been abolished; it had been perpetually overrun by hordes of savages, and it has also suffered at the hands of the builders, after the revival of learning. I mention this because we have now no means of comparing the arrangement of the marbles on the walls of Byzantine churches with those of Roman buildings. The church of St. Demetrius, at Thessalonica, is a two-storied arcaded basilica, with clerestory windows above, and is covered with a timber roof. The nave between the bema and the narthex is divided into three compartments by piers, and between the piers there are, in the middle bays, four columns of verde antique, and three columns of other marbles in the two other bays. Some of the columns have old caps, too small for the shafts, and some caps are Byzantine; there are also two verde antique columns to the narthex. Each verde antique column in the centre compartments of the nave stands on a short pedestal about 2 ft. high, showing that the shafts had come from older buildings; they have classic bases, but the shafts themselves have the wide fillet under the apophyge, which is characteristic of Byzantine shafts. None of the other columns have pedestals. Above each capital is a block, apparently the survival of the entablature; some of these blocks are carved, and some have only a cross. The lower arcade has Corinthian or composite caps, and the upper arcade Ionic ones; between the columns of the nave was once a solid moulded balustrade, many pieces of which are now used as paving, and there is also one side of an ambo, now used for the same purpose; a similar balustrade to the upper arcade still remains. The whole surface of the walls is covered with slabs of marble.

Under the bases of the upper arcade, a cornice is represented in pietra dura. Beginning at the top there is a green strip between two white ones; below that is a strip of red marble for the corona; below this, plain square cantilevers are represented in perspective, capped with a bead and reel, and a dentil band; the soffits of the cantilevers are red, with a white side and end, the latter has a black panel in it; between the dentils, and for the soffit of the corona, red marble is used, and black for the cantilever band, with a white star in the centre of each space; in the middle of each pier the cantilever is turned the reverse way, and the square piece between the sides is filled in with black, with a white star, and the spandrel piece at top is also black with a white honeysuckle. Below the cantilever band is a white band, and below that is a red one, which completes the cornice. In the spandrels of each of the arcades, below the cornice, there is a square panel, whose bottom touches the extrados of the arches, inlaid with coloured marble in geometric patterns. The whole church inside has a distinguished air.

At Sta. Sophia, Constantinople, there is a broad band of verde antique above the skirting; above this are four bands of light marble dividing the height into short spaces at the top and bottom, and a longer one in the middle. Above the cornice is a band of verde antique, and then one band of lighter marble divides the spaces into a long lower, and a shorter upper division, above which comes the pietra dura work. In the lower part, the centre panels have stiles and rails; these are first marked out by projecting slips of white marble, with the Venetian dog tooth on the face, and the stiles and rails are carved, the panels being of porphyry, verde antique, or some other precious or effective marble. The same thing occurs in the lower panels of the first-floor, only the stiles and rails are not carved; in the upper and lower panels of the ground-floor, and in the upper panels of the first, the panels are only separated from the ground by one line of white marble, with the Venetian dog-tooth going all round them: some are filled with strongly-veined marbles, placed so as to form vertical squares in the middle, with zig-zag sides, and some have horizontal zig-zags. The variety of precious marbles used is quite extraordinary; they are all mentioned in the poem of Paul the Silentiary and through the kindness of Mr. Brindley are here exhibited. As I said before, the sea air and the dust have given a uniform dusky colour to most of the marble, like that I showed you from Salonica, though the white, the purple porphyry, and the verde antique still show their colour distinctly. There is an effect of subdued magnificence about the marble work, but I have no doubt the effect would be better if the marble work were repolished, provided that there is no streaked rosso-antico; this has wide streaks of the colour of a raw steak, with livid white between: as a rule each block is cut into four slabs, and so put together that the four diagonal streaks make a symmetrical panel. Some years ago I saw parts of San Vitale that had lately been repaired with streaked rosso-antico newly polished, and the effect was glaring and ghastly.

At Constantinople, the Kalendar mosque, and the church of the monastery in the country, have their walls treated in the same manner, only at the Kalendar mosque much of the marble is replaced by coarsely-painted imitations; at both these churches there is some lovely Byzantine acanthus, carved in white marble, and pierced right through—some of the loveliest work I have ever seen. The difference between these two churches is this: one now looks magnificent and the other looks as if it had once been so. There is a veined marble screen in the southern gallery of St. Sophia, supposed to have formed the Imperial pew for the Empress Theodora, her maids of honour, and perhaps her court, but, as far as I understand, it was on certain occasions used by the Emperor, who afterwards descended by the wooden staircase (No. 13), and I do not know if Theodora sat with him. We know that the coronation took place in the ambo, and that the Emperor had a seat in the solea, the vast E. hemicycle, and in the bema as well.

The screen now consists of two imitation doors, in two leaves of veined marble, with a wooden door between them. Each pair of marble doors has an architrave round it; the two leaves are shut against a narrow pilaster, enriched with ornament, with a capital and base. Each leaf has five panels in height. Two panels out of the five have large plain bolection mouldings, and no ornament except a bead and reel, and the three others have the bolection mouldings enriched with the *raie du cœur*. The stiles and rails are moulded, and stopped at the centre of each panel both ways, and in the blank space between the stopped ends are bosses, except opposite the middle of the third panel in the shutting stile, where the rings for opening the doors are carved. The screen is capped by a square ornamented band. On one side the Imperial eagle remains. The late W. Burges used to be emphatic on the importance of this screen, as showing what wooden doors were like in Justinian's time; there is a photograph exhibited of this screen. A drawing is exhibited of the two leaves of a door, now used as jamb linings, at *Μονὴ τῆς χῶρας* (see lithograph), which are much more effective than the doors before described, but of similar treatment, except that the panels were once sculptured with figures, which have been chipped off. There are the remains of the carved rings which were evidently in lions' mouths. In this church was once a portrait of the Virgin, attributed to St. Luke, and these doors might have enclosed it. The holy robe of the Virgin was alternately kept here and at the church called Hodegetria, and these doors may have closed in the cupboard where it was kept.

It is hardly necessary to speak of "pietra dura," as it is so well known; it is merely inlaying one marble with another, so that beyond the excellence of workmanship, there is nothing but the design and the harmony of colour to speak of. That at Sta. Sophia is

admirable, and consists mainly of black and white, enlivened by pieces of green and red porphyry here and there. "Pietra dura" might now be used with great effect in sumptuous modern buildings, especially when near the eye.

Mosaic is believed to have taken its origin from floors or paths being paved with little pebbles of different colours, and this sort of mosaic might be very effectively used now. Hamdy Bey, the Director of the Imperial Museum, and the discoverer of the magnificent sarcophagi at Sidon, has a house beyond Pera, on the Bosphorus; the garden paths are ornamented with a floral pattern in black pebbles on a ground of pale yellowish-brown ones, and it certainly looked very quaint and pretty.

Mosaic certainly bore the name expressive of its origin up to the eighth century, for in the treaty made between Walid and the Roman Emperor it was called *ψηφοσις*, and may bear that name still in Greek, Arabic, and Turkish. According to Pliny, it was introduced from Greece by Sulla, who used it for the pavement of the Temple of Fortune he built at Prænestе. Pliny says:—"Since his time these mosaics have left the ground for the arched roofs of houses, and they are now made of glass." The most celebrated pavement mosaic of antiquity is that of the battle of Arbela, when Alexander the Great finally overthrew the power of Darius. This mosaic was found at Pompeii, and it could not, therefore, have been later than the first century. Pompeii having been destroyed in 79 A.D., this mosaic is supposed to be a copy of a picture.

Most exquisite specimens of floor mosaic, as far as workmanship goes, have been found in Hadrian's villa at Tivoli, composed of fine stones in minute cubes. I have said nothing of the pavements of Byzantine buildings, for the very obvious reason that every mosque is covered with carpets or matting, so you cannot see the paving; but I believe it is generally the superb Opus Alexandrinum work, principally composed of purple and green porphyry let into white marble; but beautiful as marble mosaic is, it does not equal the force and splendour of that composed of glass cubes, and when this has a deep ocean blue ground it is the most magnificent of all decoration, except stained glass.

I told you before that the exact date of gold and silver mosaic is not known. Supposing St. George at Salonica was built by Constantine, and the mosaics are co-eval with the church, there is perphaps no mosaic left that is so splendid.

The Bema is said by Texièr and Pullan to be at the East end, another argument for the church not being of Constantine's time.

In classic days, with the exception of portraits of the Emperors, or of private persons, the only titles to representation were being gods, physical beauty, and intellectual eminence. Gods, goddesses, nymphs, and demi-gods, were pourtrayed as the most perfect specimens of human beauty; for intellectual attainments there were lawgivers, philosophers, poets, conquerors, and statesmen.

Christianity changed all this; physical beauty was rather looked upon as the "sign of the beast." The forms most affected were those of saints emaciated by fasting, privation, suffering, and neglect, with their intellectual faculties almost extinguished by loneliness, vigils, and despair.

Byzantine pictorial art was, as it were, the mingling of these two streams of the Classical and Christian ideals. The Byzantines were too much imbued with the Classical spirit, and were too much encompassed with the masterpieces of Classic art, to be wholly devoted to the Christian view, not to speak of their instincts as artists, being in revolt against the pourtrayal of disease and deformity; so if we get an emaciated saint, we generally get some plump angels to complete the composition.

To return to St. George at Salonica. The zone of the dome on which the mosaics still remain is divided into compartments by mosaic ribs, and each compartment is filled with two or three saints in front of an architectural background; the ground and the palaces or churches, are all of gold; the architecture is made out by being edged with colour, and having coloured friezes, bands, and ornament upon it. Each building is a golden house indeed.

The curtains with which all the openings are furnished are looped up, and are mostly of light tones and lively colours, bright peacocks and grey peahens, storks and cranes, perch on the roofs; in some cases pendent lamps are shown in each of the arcades. The saints or martyrs are in coloured tunics and togas, with bare heads and hands, though in the case of old saints it is difficult to say whether it is their white hair or a white skull cap that is shown. They are supposed to be lifting up their hands in prayer.

One compartment contains three figures, viz., Therinos in the centre, Philip on his right, and Basil on his left; they have dark grey tunics, and pale blue togas, shot with pink, Philip has a white dalmatic; the floor on which they stand is gold. In another compartment Romanos and Eucarpionos stand right and left, on each side of an apse, the pavement is of grey slabs, with a darker stone in the middle of each. In another compartment, Onisiphoros and Porphoirios stand on the right and left of an apse, with a ciborium in the middle between them; the floor is gold. In another Kosmos and Damianos stand to the right and left of a circular ciborium, with three carpeted steps, light green curtains, two thirds of the height of the columns, enclose it, and the hollows between the loops of the curtain and the golden rod are scarlet. These saints stand on a grey floor, the greater part of which is in shadow. The vaults of the chapels are also covered with mosaic in patterns, some having silver mosaic and some have birds in the panels.

Perhaps the finest mosaics are to be seen at Ravenna, in the tomb of Galla Placidia, the daughter of Theodosius the Great, who was once a Queen, once an Empress, and twice a slave. The tomb is cross-shaped, and the arms or transepts are covered with deep blue mosaic, and on this are magnificent ornaments and figures in gold. Some of the blue mosaic in this tomb is the colour of a peacock's neck. Galla Placidia died in 450, and I suppose her corpse was embalmed, for it is related that her body was placed in the tomb seated on a chair of cypress-wood.

In St. Apollinare in Classe, of the sixth century, there is a most charming mosaic in the apse, with lambs in a meadow. The most stately and monumental mosaics are those in St. Apollinare Nuovo; on each side of the nave are friezes, the one on the north side shows a procession of twenty-two virgins, with the mitre on their heads, carrying crowns in their hands to the Virgin and child at the east end; behind them is a grove of palm-trees; on the south side at the west end is the town of Ravenna, with Theodoric's palace, and then follows a procession of twenty-five saints holding crowns and receiving the benediction of the Saviour, who is sitting on a throne; in this church is found a mosaic portrait of Justinian.

San Vitale has the most lovely mosaic ceiling over the sanctuary I have ever seen. The ceiling is groined and the four compartments have the ground counterchanged. The east and west compartments have dark green foliage on a gold ground, and north and south have olive-coloured foliage edged with gold on a ground of green turquoise; in the scrolls are all sorts of animals; in the centre of each compartment four winged angels stand on azure balls and support a circle of leaves, containing the Lamb, on a deep blue ground studded with gold and silver stars. There are also other fine subjects in the Sanctuary, notably Justinian and Theodora opening the church. Some of Theodora's ladies-in-waiting are clothed in tissue of gold enriched with jewels. The Empress is crowned, and in the Imperial purple. On the bottom of her robe the adoration of the Magi is embroidered in gold. She has strings of pearls from her head-dress hanging down to her shoulders. The nimbus in those days is said to have been an emblem of power, rather than of sanctity, for she has it.

I am indebted to Mr. Oppenheimer for a study of another fine mosaic in San Vitale (exhibited).

Procopius (Lib. I., cap. 10) gives a description of the mosaic in the vestibule of the Imperial Palace of the Chalce:—"The entire ceiling is decorated with paintings, not formed of melted wax poured upon it, but composed of tiny stones adorned with all manner of colours, imitating human figures and everything else in nature. I will now describe the subjects of these paintings. Upon either side are wars and battles, and the capture of numberless cities, some in Italy, and some in Libya. Here the Emperor Justinian conquers by his general Belisarius; and here the general returns to the Emperor, bringing with him his entire army unscathed, and offers to him the spoils of victory, kings, and kingdoms, and all that is most valued among men. In the midst stands the Emperor and the Empress Theodora, both of them seeming to rejoice and hold high festival in honour of their victory over the kings of the Vandals and the Goths, who approach them as prisoners of war led in triumph. Around them stands the Senate of Rome, all in festal array, which is shewn in the mosaic by the joys which appears on their countenances; they swell with pride, and smile upon the Emperor, offering him honours as though to a demi-god, after his magnificent achievements. The whole interior, not only the upright parts, but also the floor itself, is encrusted with beautiful marbles, reaching up to the mosaics of the ceiling. Of these marbles, some are of a Spartan stone equal to emerald, while some resemble a flame of fire: the greater part of them are white, yet not a plain white, but ornamented with wavy lines of dark blue. (Procopius, the buildings of Justinian, Lib. 1, cap. 10.)

In the last lecture I gave you Constantine Porphyrogenitus' description of the mosaics in the Cenourgion, built by his grandfather, Basil the Macedonian.

There are some lovely ornamental mosaics in the narthex and the upper galleries of Sta. Sophia. Those in which the harmonies are got mainly by deep blue, silver and green, with a little gold and red, are, to my eyes, the finest. The figures have been mostly obliterated by painting or gilding over them, though in some cases a faint outline of them can be seen. Christ, the humble shepherd, with a crook, and a lamb in his arms, became later an Oriental potentate clothed in magnificent apparel, and sitting crowned on a golden throne. In spite of Byzantine art getting ossified by ecclesiastical interference, the Byzantine artists did keep for a long while the Classical traditions, and certainly learnt the art of monumental decoration. The simple and more primitive rules were always kept in view, dignified repose in the figures, and almost absolute repetition. I saw very little of late mosaic in Greece, it was not only nearly dusk at Daphne but the church was boarded up for repairs, but we have here most beautiful and careful drawings of its mosaics by Messrs. Schultz & Barnsley, and of other mosaics in Greece, &c. Some of the subjects in the narthex of *Μονή τῆς χώρας*, all in mosaic, are quite Classic in the folds of the drapery, and some is beautiful in colour, almost like a piece of blue-vert tapestry on a gold ground; the rubbing of the head of St. Paul is lent by Professor Lewis; these mosaics are said to have been executed in the reign of Andronicus II. (1282-1328).

You must recollect that Constantinople was at one time a pefect museum of the master-pieces of ancient art; the Hippodrome and the Augusteum were full of them, and there can be little doubt that these masterpieces were studied by the mosaic workers and illuminators. The great difficulty is to tell the age of illuminated MSS., for the illuminators were very fond of copying subjects from the old MSS. and from old mosaics. There are often to be found traces of old classical compositions, both in mosaic, and in illumination. At the Baptistery at Ravenna, there is John the Baptist on the bank, and Christ in the Jordan. This is not only shown as water, but is personified as well by a river-god with an urn and I O R D written over him. The MS. of Joshua in the Vatican, said to be of the seventh century, has many illuminations that are quite classic in treatment. Isaiah between night and morning from a psalter looks like a classic picture; it is now in the National Library at Paris, and is said to be of the ninth or tenth century. There are the remains of a few painted figures in the North Church of the Monastery in the Country; one could not judge of the general effect as decoration, as the bulk of the walls were whitewashed, and, besides, I am not a painter.

I beg to remind any painters here present that there is a great future in store for them, in the two great popular arts of glass painting and mosaic. I say popular, because large examples of these arts are more seen by the people at large, and more appreciated by them than what is looked upon as superior work.

I know that glass is not only a transparent medium, but when used for windows is meant to let in light, so that in this respect it is false to nature, but it admits of form, composition, and colour, and as regards this latter, the transcendent loveliness of good stained glass in sunshine, is not only sufficient to excuse all

other faults, but is to me the most heavenly form of beauty.

Titian said of mosaic:—"It is the true painting for eternity," but from an architect's point of view it is wanted as the decoration for a building, and not as a bad copy of a picture in oil. I am deeply thankful to all living painters for preserving for my delight the beautiful landscapes, scenes, and persons of the day, and for showing me beauties I have not seen, which have been created by their imagination, and to the past painters for preserving the beauties of former times; and there is no donbt that for certain delicacies of colour, and for certain qualities of texture, oil painting is supreme, but it is rarely so decorative in buildings as stained glass or mosaic. Pictures are transcripts from nature, either directly from things seen by the eye of the painter, or evoked by his imagination; they are entities of themselves, and transport the beholder to the places they represent and to the period of the actions they portray. They present other scenes or other periods than those immediately surrounding the beholder; they appeal forcibly to his imagination, and transport him elsewhere. I ask myself is this the true decoration of a wall or a ceiling? This wall or this ceiling is not only a necessity but a patent fact, and it seems only to ask to be made beautiful to look on and to require a certain amount of conventionalism in its treatment. From a painter's point of view, the exchange of this prosaic reality for some poetic vision may be looked on as an inestimable gift; the magic of his brush has annihilated the reality. Instead of a wall I see,—

> "The maid-mother by a crucifix,
> In tracts of pasture sunny-warm,
> Beneath branch-work of costly sardonyx."

But as an architect, I do not want my wall or my ceiling transmuted; I only want it to be as beautiful as possible, and really the doing this affords the means of showing purity of outline, masterly composition, and certain broad qualities and harmonies of colour. It by no means excludes figures, it only excludes pictures, and I contend that the rigid lines of architecture, tend to give style to the pictoral composition that is put upon them. White marble statues and bas reliefs are from their colour equally fatal to all full-coloured decoration. I hope to see the backs of all our porticoes filled with mosaic, and all pediments and niches full of sculpture. I must also say to those painters who wish to work in stained glass or in mosaic, that they must do much of it with their own hands, for I believe that we shall never get either art, perfected by cartoons made in a studio with the work carried out by mechanics. It is essential to know the material, and to learn the art of producing the required effect in the spot intended, and this spot is often high up and peculiarly lit. Enamelled brick or pottery is another means by which our dismal, smoky streets may be made lovely and resplendent with colour. The health of the inhabitants would not only benefit by the smoothness of the surface, and the ease with which it could be cleaned, but by the beauty of the design and of the colour.

What a fascinating vision it is to see London, and all the great manufacturing towns, changed from dismal, sooty cities to those in which every building is full of colour and artistic composition, made lovely by light and delicate or deeply-coloured harmonies, or resplendent with gilt bronze, polished granite, porphyry, and glass mosaic.

MARBLE AND MOSAIC:

THE ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of this Association was held on Friday, the 20th inst., in the meeting room of the Royal Institute of British Architects, Conduit-street, Mr. Leonard Stokes, President, in the chair.

On the motion of Mr. F. R. Farrow (Hon. Sec.), a vote of thanks was accorded to Messrs. Perry & Reed, the architects, and Messrs. Hobbs & Co., the builders, for allowing the members to visit the new buildings now in course of erection between the Strand and the Victoria Embankment, on Saturday the 21st inst.

It was announced that the next visit would be made this Saturday, the 28th inst., to St. Philip's Church, Stepney, by the kind permission of the architect, Mr. Arthur Cawston. (We gave a description and several illustrations of this church in the *Builder* for October 11, 1890.)

Mr. W. E. Sanders was elected a member of the Association.

The Chairman then said that as the members were aware, they were to be favoured with two papers that evening on the interesting subjects of marble and mosaic, by Mr. T. R. Spence and Mr. Gerald C. Horsley. He would first of all call upon Mr. Spence to read his paper.

Mr. Spence's Paper.

I do not propose to enter into any historical details as to the first and subsequent application of mosaics.

In a general sense we understand mosaic as a combination of various more or less imperishable materials—fixed together by cement or other adhesive substances—and laid over walls, floors, &c., with a view to permanent decorative effect. The substance of the tesseræ is of many kinds,—namely, glass, cheap and precious marbles, hard stone and burnt clay,—those last-mentioned being mainly in use for architectural purposes.

For decorative schemes we collect as many gradations of colour as are obtainable in such durable materials in their natural or manufactured state, and thus form a colour palette which we regard in the same sense as a painter would his pigments.

Of course the first proceeding is to prepare a design on a small scale, which should embrace one's notions of colour only. Then follows a full-sized cartoon, which I need hardly add should embrace one's best efforts in drawing. A tracing is made of the latter and transferred to sheets of cardboard. This cardboard is cut to the size of certain sections of the design, and, for convenience, should not be more than, say 20 in. sq. Of course it will not always be square, but will bear the same relation to your complete cartoon as a map of the counties would to that of all England. Now, working from the small design (of colour), the tesseræ are cut to the forms required, laid face downwards, and glued on to the cardboard sections containing the enlarged cartoon. When the design is all worked out on these sections they are ready for fixing on to wall or floor by laying them home on a float of cement. When the cement sets, the cardboard sticking to the face is washed off, and the joints of the tesseræ flushed over with cement and cleaned off, leaving all joints filled up level.

There are other processes used for the same end. The technical processes need not occupy our attention at present.

There is one process that may appeal to you, and that is executing the work *in situ* by floating-on a limited expanse of cement, and sticking on the tesseræ at once. It has the advantage of enabling the artist or architect to see the effect of his efforts under the fixed conditions of light and height.

I shall confine myself to vitreous or glass mosaic, which for durability, extended scales of primary colours, and their numerous semi-transparent gradations, is unequalled by any substance yet used for wall or floor decoration. I am surprised that having all these fine qualities, it is not more used by architects. If you require proofs of its triumphs go to St. Mark's, Venice, and stand under its mellow golden roof. There you will find its domes and vaulted aisles, nave and transepts, entirely overlaid with gold mosaic, into which ground is worked—in the deepest and richest colours and their gradations that contemporary manufacturers could produce—subjects selected from the Creation down to the life of Christ, in addition to containing a complete alphabet of early Christian symbolism. The roof surfaces, being one succession of over-arching curves, become receptive of innumerable waves of light and broad unities of soft shadows, giving the whole an incomparable quality of tone and a low juicy colour.

Never use your gold but on curved or undulating surfaces. Flat planes of gold only give the effect of a monotonous metallic yellow, and can never be beautiful, owing to the absence of the variations that come with waves of shadow.

By letting out the reins of imagination we might feel that in St. Mark's a tenth century Giorgione has given off the mental impressions of all the golden autumns of his life. His material gave him an advantage over his great followers of the fifteenth and sixteenth centuries, insomuch that glass has a living and glowing quality of light not existing in the somewhat clouded purity of oil-paint, or fresco.

In St. Mark's we have an example of the superb treatment in deepest and most Titianesque scales applied to curved forms; but to find a similarly complete example of the use of lighter tones and on flat surfaces, we must turn to Ravenna.

I can give you no adequate description of the wall-mosaics of Ravenna. In the sense of delicate colour, they remind me of some of the subtle harmonies of some of the finest works of the modern French school,—of the impressionists and others who combine that quality with a true instinct for design. In standing before them you feel that the Dagnan Bouveries, the Mersons, the Cazins, the Puvis de Chavannes, &c., of the fifth century have had a hand in the conception and realisation of the beautiful compositions to be found in the nave walls of the two churches of St. Apollinare Nuovo and St. Apollinare in Classe. Here, all the scales are of delicate degrees of light tones, supreme in their beauty, completeness, and, most important to us, their true decorative instinct. In the Baptistery we find what I may term a third essay in colour, by weaving in rich, dark, and glowing colours on figures and bold sinuous forms of ornament in such a skilful and judicious manner that the whole dome seems to be alive with harmonies although they are mostly primaries.

As you know rules for the disposition of colour are futile, yet some details that struck me as eminently satisfactory may interest you. In all cases the tesseræ are of small dimensions, about a quarter of an inch square. The stucco joints are large and open surfaces, far from level but undulating considerably. The tesseræ stick up in parts, brilliant edges showing. Absence of flatness gives play to the light. The grey of the stucco joints brings the whole composition together, serving as cool greys in a picture to give tender unity.

Gold, apart from backgrounds and large surfaces, is used very cleverly in small pieces in borders of garments, and more especially in thin outlines to make out the drawing and certain flowing forms of ornament. Brilliant pieces of glass actually moulded at the kiln into forms of jewels add brilliancy to crowns, borders, &c. These stick boldly out from the surface.

I noticed in the Baptistery, below the springing of the dome, a frieze about 2 ft. 6 in. deep, having the ground entirely in black, through which was woven in thin gold lines a delicate foliated design. This, in conjuction with the upper surfaces in dark, rich colour, had a most delightful effect.

We, as students, will learn most from the Ravenna examples, for great are the needs of light and silvery colour in this country, where grey and gloomy days far outnumber those in which the sun gives liberally of his light.

I may say, in passing, as our subject is really a matter of decoration, that all our nineteenth century efforts in this direction are all of a somewhat gloomy tendency.

We fill our rooms with imitations of sombre Spanish leather, stain and paint our woodwork in leathery and muddy tones, to arrive at what is now a sort of decorator's god. Quaintness is the name of that god. Many are the sins for which he has to answer. Had we not better worship a deity called Beauty, whose place is a little higher up Parnassus?

Why should we not in our endeavours attempt in some measure to transfix the brilliant harmonies that follow the sun in his liberal and gracious course?

This muddy quaintness is certainly pleasant for brief periods, when lamps are low and firelight gilds and deepens its parts. Turn the sunlight on these so-called triumphs of the modern decorator's art, and then you feel the lack of many a phase of colour that might have been borrowed from the thousand and one examples that in nature he vivifies and makes brilliant.

Referring again to the Ravenna mosaics, I can only add that at the present day an extended palette of coloured grass is available. The technical difficulties are not great, and there is no question as to the fine qualities of design and colour that are to be obtained in this material.

The great point in this, as in all other schemes of decoration, is the art, the mental quality of conception, and the sense of colour and fitness. If we hold the precious heritage of an artist's mind,—that divine and rare something which gives form, colour, and completeness to a story, a dream, or a vision,—then very

little difficulty follows in making vitreous mosaic a valued servant in the realisation of a fine creation.

It is the function of the architect to design suitable spaces for colour decoration, bounded by dignified mouldings and other details of his constructive art in such a manner that the addition of decorative colour shall in no way mar the scheme of his complete work, but shall (under these well-ordered distributions) have set on it the seal and crown of colour which is inseparable from a perfect piece of architecture. In such spaces he may dream his dreams, tell his stories, and stamp on them for centuries his subtlest and divinest thoughts.

May I not urge that to such spaces must be given the best that is in you, for once placed so shall they remain unchanged through generations, time being powerless to add any mellow garment of tone or softening quality whatever?

I mistook the title of the subject in thinking that it was mosaic only, and at the last moment found that it was "Marble and Mosaic."

However, the same dominant principles underlie the treatment of marble. It is a question of the finer instincts for form and colour.

In recent years, the demand for choice decorative materials has been the means of opening out many marble quarries all over the world. Transit being easy, a large scale of varieties is available. One fine addition is the Mexican onyx.

My feeling is that the most beautiful marbles are those where the soft and sinuous veins melt and die into the general body, comparatively sharp markings dying away at the edges into innumerable gradations. Marbles having strong and hardly-marked veins present great difficulties in distribution. If they are near, they offend you with their coarseness; and, placed at a distance, the hard vein lines have very little decorative value. I should say, use these in narrow slips, with very little moulded profile, or as parts of *intarsio*.

Mouldings should be specially designed for different marbles,—I should say mainly on the principle of sudden contrasts,—that is, large members with very little curve bounded by members very small in detail, thus obtaining sharp lines, having little surface to be influenced or distorted by the veined markings, and serving to sharpen up and give form to the broader members (which show the colour qualities of the marble), much as you sharpen up an ink drawing by underlining.

These small members serve the architect's purpose for the expression of vertical and horizontal lines, and where decisive and cutting shadows are required in the composition of his work.

If delicate carving forms part of your design, I should say statuary is the best, as in it you have no veins to distort your detail.

I need hardly add that economy should be studied in using precious marbles, without injuring the durability of the work. Contours may be built up in thin sections.

Intarsio is a beautiful form of treating marble on an inexpensive ground. Gem-like effects may be obtained by inlaying with smaller pieces, following such ornamental forms as your inventive brains shall dictate. Perhaps the pocket of your client will be the chief dictator.

Heraldic emblazonings inlaid in marble are highly effective. The conditions of the heraldry necessitate the use of many varieties, but in such small quantities that on a large simple field they are rarely out of harmony. In addition they map out a large and interesting variety that will save the worry of creation of designs coming entirely from your own brain, and you know the worry of an architect's life makes him hail with pleasure at times a rest from the strain of creation.

This heraldic work may be seen to perfection in the chapel of the tombs of the Medici at Florence.

At the Pitti Palace are some tables which you may know where marble *intazzio* can no further go.

Alabaster does not appeal to me; it is somewhat sugary in results.

If you are fortunate enough to have a sculptor who is a sort of nineteenth-century Donatello, let him work his will on statuary or such restful marble.

The celebrated monument in the Church of Santi Giovanni e Paolo, at Venice, which Ruskin says is the finest monument in the world, is, if my recollection serves me correctly, in white marble, and its beauty comes entirely from the sculptor's art.

Such monuments give you much better than any words of mine ample suggestions for marble treatment.

I may quote such names as Nicolo Pisano and Verocchio.

Photographs of some of their work I have brought. Note Pisano's beautiful white altar at Bologna, and Mina de Fiesole's work in Florence. They all show the sculptor as supreme. Why should not we encourage individual young sculptors more? Give them portions of your work in which they can put all the fervour and enthusiasm of young manhood. Their powers may not be ripe, but they possess a *verve* and intensity that may have for ever fled when in later years the imagination is less enthusiastic and the pulses slower. I am sure there are many young sculptors now wanting commissions who have been trained at the Academy, and better still, in the best French schools. I maintain that the contemporary French school of sculpture is in its line equal to any school of sculpture that has ever existed, not excepting that of Pheidias or that of the Italian Renaissance of the fifteenth and sixteenth centuries. I believe history will confirm this. Why not give these men an opportunity and help on the movement to found a truly English school of sculpture, rather than give all such work to trading firms of carvers, who will do you any number of superficial feet, properly priced and scheduled (and in the bills of quantities), of any style you please, from Prehistoric to Victorian Gothic? Of course, this is our British way of founding a great school.

There is one method of treatment that appeals to me very strongly, and that is, the application of coloured metals to marble, more especially bronze and copper. I may quote as a successful example the Wellington Memorial at St. Paul's. Another suggestion of what might be done in the way of bronze panels is suggested by the Fawcett Memorial, by Gilbert, in the west chapel at Westminster Abbey.

Mr. Horsley's Paper.

I am sorry that neither time this evening or a proper capacity for treating the subject properly will allow me to speak with anything approaching real justice on the subject arranged for discussion to-night. The title of this subject is, I believe, "Marble and Mosaics," but I can, of course, only speak a very little of marble where the use of it comes in immediate connexion with mosaic; and, through the kindness of several friends, I am able to show you some illustrations of the use of marble and mosaic in Italy, Sicily, Greece, and Egypt. We have many instances of the most beautiful use of marble in England, but this is a large subject by itself, and, as I read the title of the paper, we are only to-night considering marble and mosaic in juxta-position. I am anxious to-night to touch a little upon the modern uses of mosaic, but, before doing so, perhaps I should refer to the illustrations and photographs Mr. Spence and myself have brought down with us.

St. Mark's at Venice, the Capella Palatina in Palermo, the Cathedral of Monreale, and some churches in Greece and Constantinople, and indeed throughout the East, present to us some of the finest combinations of marble and mosaic known to us. Unfortunately, but few remains of such combinations remain of the Greek and Roman periods. These photographs and drawings will show you what wonderful works have been performed by the Eastern artists, for I need hardly remind you that St. Mark's at Venice was built by Byzantine architects, just as the Capella Palatina and Monreale were built by Saracens, though nominally by Normans who had made Sicily their kingdom and home. In Sicily, the marble is almost always of beautiful cippolino, that exquisite creamy white marble with green veinings. In St. Mark's no cippolino is used, but green and red marble; nor are the slabs in St. Mark's so regular in size as in the Sicilian churches. You will notice how beautifully arranged the marble is in these, with its borders and divisions of gold and glass mosaic, compared to the wall-linings in St. Mark's.

The builders of St. Mark's were not, of course, of the same mould as the Saracens. Both carried out their work as it seemed best to them, for both builders were artists. At the same time, judging partly from appearances, it would seem that the Sicilian marbles were specially prepared for their position, while those in St. Mark's appear, in some cases, to have been taken from more ancient buildings and adapted to their present position. No doubt marble and precious stones were transported in classical and mediæval times from country to country for the purposes of art. But still more constantly the workmen used the materials they found on the spot. We find, for instance, the Romans in Britain using limestone and chalk, Purbeck and ordinary stones of various colours for their floors, and in Carthage and Hallicarnassus, where marble naturally abounds, they used marble. (Portions of the latter mosaics are now in the British Museum.)

The Italian workmen, too, who laid the Opus Alexandrinum pavement in Westminster Abbey used stone where they would have used marble in Rome.

The most ancient piece of floor mosaic known is a small piece at the Temple of Zeus at Olympia. M. Laloux, the French architect, has lately published a work on Olympia, in which he shows this mosaic restored, showing it most elaborately, but I believe the only portion which really remains is a representation of a Triton and dolphins. I understand, though, from a friend who has lately been in Greece that this mosaic is formed by differently-coloured pebbles, and is not of cubes of marble or stone at all. Other examples, but of later date, of this pebble mosaic have been found in Greece.

I am indebted to Mr. Arthur Bolton for these tracings of Roman mosaics made by him at Pompeii. He first took rubbings of the mosaics, and coloured them on the spot, and these tracings are from his rubbings.

Mosaic work may be divided into the following divisions:—I. For pavements. 1. Tesselated in which the design is formed of small cubes generally of marble, more rarely of glass and clay.

2. Of sectile work formed of large pieces of marble, shaped and cut so as to fit accurately one with another.

II. For walls and vaults, fictile and vermiculated (from vermes worm), *i.e.*, pieces of opaque glass in small cubes arranged so as to form pictures.

The opus Alexandrinum work is often partly sectile and partly tesselated.

Mr. Ruskin says in the Stones of Venice:—"There are two means of delight in all productions of art: Colour and form. The most vivid conditions of colour obtainable by human art are those of works in glass and enamel," and again, in speaking of the wall mosaics in S. Mark's, he calls the church "a vast illuminated missal, written within and without in letters of enamel and gold."

Professor Middleton, in his book on Rome, tells us that the Romans used glass mosaic and marble wall linings largely. I show here a diagram taken from an illustration in his book, showing the method pursued by the Romans in fixing marble linings to their walls. He says "Marble linings were usually fixed with great care, and were tied to the wall with long hook-like clamps, the ends of which were fixed with melted lead if the wall was of stone, or, if of brick, they were wedged into joints. These clamps were usually of iron, but in the more careful work bronze was used. The slabs were cut into thin pieces with saws and sand and water, emery being used for the harder stones. It is impossible to realise the amount of rich marbles which ancient Rome contained," and it should be remembered that it was not till the first century, B.C., that marble appears to have come into use there. "For more than three centuries marbles, alabasters, and porphyries in endless variety were being dug out in countless oriental quarries by whole armies of workmen, and were constantly being poured into Rome. Scarcely a church or a palace in Rome is without columns and wall linings, all taken from ancient buildings. The great christian basilicas, and especially the more magnificent chapels, such as those of the Corsini, Borghese, and Cibo families, owe their splendour entirely to these stolen marbles. Even the immense quantities which still exist give no notion whatever of what Rome once possessed. For by far the greater quantity perished in the limekilns of the early middle ages."

The Greek Byzantine artists were not so careful, I fancy, in the fixing of their marble linings as the Romans. In many churches the slabs are only secured with bent nails. I do not know how the beautifully neat-looking marble linings of the Sicilians and the Arabians

are secured to the wall. It may be that the simple beads the Arabian workmen in Sicily were so fond of using as part of the rich glass mosaic border which divided the slabs of marble have something to do in securing them.

I have here a drawing of a wall lining of a chapel in Saint Apollinare Nuovo in Ravenna. It shows that the artist has designed a beautifully-shaped vase; it may be that the piece of marble he had to deal with expressed this shape, and that he trimmed it and gave it life. I do not know that it has any direct significance. The circles represent half balls of rich marbles.

For really-finished workmanship, the Arabian work in Sicily of the eleventh, twelth, and thirteenth centuries and in Cairo are far superior to the Italian and Greek work. As a rule, the Cairene workmen used black and white, or dark green and white marble in long and slender widths, making beautiful patterns in this way; the Saracens working for the Norman Kings of Sicily contrived in the Cathedral of Monreale, La Martorana, and the Capella Palatina high dados of marbles, each slab divided from the other by a geometrical pattern of glass mosaic about 4 in. wide, with marble beads.

Surmounting the marble was arranged a frieze some 18 in. to 2 ft. deep of mosaic.

Glass mosaic was constantly used by the Romans for wall decorations in conjunction with marble wall linings, notably in the passage discovered on the Palatine, the house of the Vestals and the baths of Caracalla, but it was not till the Roman Emperors, Constantine and Justinian, so directly encouraged the arts of Byzantium by living themselves in the East and by building and decorating in the completest manner large churches and palaces, that the great art of glass mosaic working sprang into strong life.

In a very interesting paper on opaque glass, recently read before you by Mr. James Powell, a complete account was given of the making of glass or enamel mosaic, but I may be excused if I repeat a little of what he said. Glass mosaics are really coloured enamels or opaque glass of different colours. These enamels are formed of the same materials of which common glass is composed, but to these materials are added oxide of tin which gives the necessary opacity to the material and its extreme hardness; other metallic oxides are added and these give the glass its colour. All these materials have to be properly prepared and fused together and the degree of opaqueness and also the quality of colour depends partly upon the quantity and quality of the mineral elements in union with those of common glass, and are partly dependent upon the degree and continuance of heat to which the whole composition is subjected in the process of fusion.

If the enamels are not properly prepared they are not so lasting and become affected by the atmosphere.

Mr. Powell said that no doubt the paste was made in the same manner as obtains to this day in Murano. He said: "Crucibles are ranged much like washing basins in a lavatory, with the wood fire underneath; the glass, when sufficiently melted, is ladled out in small quantities on to a metal table, and pressed into circles averaging 8 in. diameter and about $\frac{3}{8}$ in. thick. These are then annealed, or gradually cooled in a kiln, and when cold are ready to be split and cracked up into tesseræ, which are afterwards subdivided again as the mosaicist requires."

It is certain that an almost countless number of beautiful colours can be obtained in this manufacture, purely from the addition of the metallic oxides in greater or less quantities. The Venice and Murano Glass Company told Mr. Powell they had made 37,000 colours and 400 golds.

The oxides used are copper, cobalt, chrome, gold, and manganese.

The gold and silver mosaic is, as has often been described, sandwiched between two thicknesses of glass. The gold leaf is fastened to a glass backing, and it is protected by a very thin sheet of glass on the face, the whole being united together by fusion. The backing is generally of an opaque red. If, instead of white glass for the front surface, you substitute coloured glass of pink, green, or yellow, you will get various effects of coloured gold or silver.

Besides these materials, mother-of-pearl and fine stone were used (especially in the mosaic of Justinian in S. Vitale, and King Roger in the Martorana).

I have here many photographs of Byzantine wall mosaics from Rome, Sicily, Ravenna, Constantinople, Venice, and Greece. I should detain you too long if I were to proceed now to describe them; some of them have been so often restored that they are much altered from what they once were. At the same time, they may (be broadly distinguished. In the earlier examples at Ravenna and Rome, of the fifth to the tenth centuries, we notice a more statuesque or monumental treatment than obtains in the later works of the tenth to the thirteenth centuries, specimens of which we have in Venice, Monreale, and Palermo.

These Sicilian mosaics of the twelfth century, all, of course, by Greek craftsmen, show much vigour and life in the drawing and colouring of the Bible subjects from the Old and New Testament represented on the walls above the nave arcade,—subjects taken from the menalogium drawn up by the Emperor Porphyrogenitus in the tenth century, and similar to the mosaics over the nave arcade in the Church of the Nativity at Bethlehem. While these mosaics show much life and vigour, great dignity and breadth of treatment is obtained by the simple and direct way in which each subject is treated, while nothing can be more impressive than the colossal representation of the head of Christ in the apse over the altar, and the single figures of saints grouped round him.

The mosaics of the sixth century in St. Vitale, St. Apollinare Nuovo, and St. Apollinare in Classe, at Ravenna, are simpler, not only in the scheme of subjects represented, but also in the colours used, and the still broader and simpler effect gained by this very quiet treatment.

After Gaddo Gaddi, who in the thirteenth century made the great mosaic still existing on the façade of St. M. Maggiore, Rome, the genuine art of Italian glass mosaic may be said to have ended.

It is universally acknowledged that the mosaics of later date, from designs by Tintoret and Titian, to be seen in St. Mark's, are not interesting artistically or well done; and the uninteresting character of the Vatican mosaic work to be seen in St. Peter's is well known.

The Alexandria of past days has been called the home of mosaic; and the marble pavements called Opus Alexandrinum have been constantly described. Mr. Bolton has kindly lent me some specimens from Rome. I am sorry I have no drawing here of the Westminster example.

Another variety of Christian mosaic consisted in the insertion into grooves cut to the depth of about $\frac{1}{2}$ in., in white marble, of small cubes of coloured and gilded smalto (as the Italians call the material of which mosaic is composed), and in the arrangements of them in such geometrical combination as to make most elaborate patterns.

This decoration was chiefly used for church purposes, — for screens, pulpits, episcopal thrones, ciboria, and tabernacles. The earliest specimen is believed to be the chair and tribune in the Church of San Lorenzo at Rome, made probably about 580 A.D.

The shrine of Edward the Confessor is an English example of this kind of work, in that splendid period of English art in the reign of Henry III., 1270 A.D.

For further illustrations of mosaic and marble work, I must refer you to the works of Salzenburg on Santa Sophia, Constantinople; of Orgagna's St. Mark's, Venice; and Gravina's fine work on the Cathedral of Monreale.

Now that we have passed a little in review the works of the past, I should like to draw your attention to the position mosaic occupies amongst us now. It is thirty years ago and more since Sir M. Digby Wyatt read a paper,—I believe in this very room,—about the revival of mosaic working. Salviati and Sir Henry Layard also drew the attention, many years ago, of architects to the possible use of mosaic. Many of them have used it; Alfred Stevens has designed for it; and a mosaic has been executed in St. Paul's Cathedral.

In the South Kensington Museum are several panels of modern Venetian and English mosaic, the latter made by the tile-makers of Stoke-on-Trent, chiefly of clay, and differing altogether from the glass mosaic of Venice; and floor after floor of mosaic has been laid down in England. The best designed wall mosaic we see in the apse of the American Church at Rome, made from cartoons by Mr. Burne Jones. There seems, therefore, to to be a growing appreciation for this decoration. Nor need we be surprised that this is so, when we take the great qualities of mosaic into account.

The modern use of glass mosaic is, however, suffering, and suffering greatly, from many ills. The chief of these ailments is the terrible element of commercialism which has crept in so as to impede great works being performed in it. Mosaic artists in England and in Europe and America have at present no chance of making their art known or recognised as one of the greatest arts of decoration. No one yet has come forward to pay the price necessary for this. For it must be remembered that the art of mosaic decoration, as it existed in the early centuries of our era, was as noble as painting. Mosaic is like painting. The palette open to the use of the mosaicist is unlimited, the material permits him to design and work in a bold and noble manner; he can impart a dignity and solemnity to a composition which would equal, and in many cases be finer than, a painter could do.

Fresco-painting and glass-painting have been emancipated in England; every one knows these arts are not necessarily ground down by a commercial spirit. But at present it is with mosaic, as it is with stock brickwork, namely, How much per foot can it be turned out for? The lowest price is almost always sought for by the general public; and we may consider it marvellous that mosaic work is as able as we see it. I wish it were better; but it is our duty without doubt in the course of our work to help on this great art, and assist the craftsmen who are trying to help it from the mire.

Many things seem to be against this; at present, expense prevents mosaic being used in large masses. This is almost fatal. It may be said that a mosaic fitting of a reredos or font is quite ineffective, unless the background to each is a mass of skilfully arranged marble linings or columns. Until we are able to literally cover wall surfaces with mosaic, we can never hope to get a fine effect. Then again, in modern work, the tesseræ are often rubbed and ground down, until all the life is taken out of them, and a fine level, even surface obtained, and all with infinite trouble, the joints regular and neatly cemented. Nothing could be so contrary to the old wall mosaics, where each line, each tessera, indeed, seemed to express something; the tesseræ pressed into the cement, with the fractured part (generally speaking) of the enamel showing, and catching every glint of light, each tessera fairly close to each other, and no flushing up of joints, the result was a beautiful combination of colour, the open joints adding greatly to the sparkle and richness of the whole effect; there was no exact shaping of the tesseræ here, and no rubbing down. Each tessera was clipped quickly with a sharp instrument to the shape required, and promptly put in its place. The tesseræ were made to draw, in fact, and every tessera had a mission to perform.

But the general public prefer the glazy work at present. The mosaicist, unfortunately, cannot help this, though we may be sure they writhe under it often.

So that a livelihood can be made, the old system of fixing the mosaics in position has been departed from.

The old Byzantine method was to plaster with coarse plaster the walls, and then put a coat of finer white plaster over, the design was then traced on the wall, and the mosaicist clipped away the top coating of plaster as he went on, putting on new cement and fixing his tesseræ in it to the shape and sizes he required, beginning with the gold outlines first, and working up his background and filling in his figures. In this way he saw exactly what to do according to his own views, and we know his views were generally right ones; he had many colours, and he could so place his dark and light golds as he wished, and was perfectly acquainted with every detail of his work. The system which obtains now is entirely different—a level table top is covered with sheets of coarse brown-paper or thin cardboard, on this the design to be executed in mosaic is traced, *but reversed*. The tesseræ are stuck down with paste, face downwards on to the paper; and then the paper covered with the tesseræ is ready to be pressed into position on the wall cemented to receive it. Any little accidents, such as some tesseræ falling out of position, can be easily replaced afterwards; the whole is then too often washed over with liquid cement in front. It will thus be perceived that in this method the artist can only

see half of what he is doing. The design is in the first place reversed, though he could get used to that, like the wood engraver in his work, and secondly though he can see the colour of the tesseræ he is fixing on to the paper to a great extent, though the tesseræ are not always the same colour all through, he cannot see in the very least how his gold tesseræ are looking. He has no means of knowing this at all. It is, therefore, like painting part of a picture blindfolded, and the remainder in a state of uncertainty as to the final effect. The level table-top makes the mosaic, of course, perfectly level, though happily the twist of the hands in fixing the paper with the mosaic fixed upon it in positions imparts a little handiwork to it, and, therefore, a slight, though almost imperceptible variety.

It has been said that the old method of working in mosaic would take an unconscionable time; but I have never heard anyone propose to escape some of the technical peculiarities of fresco or oil painting, or of the proper jointing of masonry in what is called good work. I fancy the evil lies in the weak spirit of the general public who wish to get as much work of a kind done for as little money as possible. I know there are mosaicists who would like to see their work better treated.

Mr. Henry Holiday has kindly lent me some photographs of a panel of a reredos representing the Last Supper, he executed chiefly with his own hands for a church in Philadelphia. This panel is 18 ft. long, and is, I suppose, 7 or 8 ft. high. He could not go and work in situ, and so he had an iron frame made, about 2 in. deep. The back was covered with iron wire, which formed a key for the plaster, which was presently put upon it; fine plaster was placed on this, the design was traced upon it, and each piece done as in the old mosaics. Of course, it took a little time to do, but the result justified the trouble, as, I think, even the photographs will prove to you. The mosaic was then sent to Philadelphia. (It was, I believe, for a few days in the Arts and Crafts Exhibition, where, perhaps, some of those present may have seen it.) It was then fixed, case and all, into the recess prepared for it.

I have to acknowledge with many thanks the kindness the Venice and Murano Glass Company and Messrs. Rust have shown in sending for exhibition some of their beautiful materials tonight.

The appreciation of mosaic in this country is gaining ground day by day, and we may even hope to see great and noble works in this material decorating our churches and public and even private buildings.

Mr. C. H. Brodie said he had much pleasure in moving a vote of thanks to Mr. Spence and Mr. Horsley for the interesting papers they had read. The subject was not one which was so well understood as it might be, or probably marble and mosaic would be more often used, and would be more successful when used. Of course, the great drawback to the use of these materials was their cost,—for that was a bugbear which had constantly to be faced in this commercially-spirited age. He was at a loss to know whence Mr. Horsley derived the idea that glass or enamel mosaics were ever rubbed down. Marble mosaics, whether on floors or walls, must be rubbed down, or the stain of the mortar or cement could not be removed; but if glass mosaics were subjected to the same treatment their brilliancy and colour would be very largely destroyed. Glass mosaics should always be fixed with the broken or fractured surfaces outwards. A great deal of modern mosaic and marble work was work to avoid, and yet, at the same time, such modern work was instructive from its failure. He quite agreed with Mr. Spence's remarks as to the necessity of mouldings in veined marbles being kept very flat, especially in richly-coloured marbles. Indeed, to work mouldings at all in such marbles was simply a waste of time and money. The only marble that could be carved with good effect was pure white statuary. Referring to the mosaics in the Guards' Chapel at Westminster, carried out under the direction of the late Mr. Street, R.A., the surrounding mouldings (which Mr. Street built in stone) had been removed and replaced by marble, and the result was not satisfactory. Another development of mosaic work which had not been referred to was the large series of mosaic pictures in Chester Cathedral, which had been executed from cartoons prepared by Messrs. Clayton & Bell under the direction of Sir Arthur Blomfield. These mosaics were entirely in marble. Then there was a fine series of mosaic pictures carried out by an artist named Shields, he thought, at Eaton Hall. Another noteworthy specimen of modern mosaic was contained in the Garfield Memorial at Cleveland, U.S.A. The cartoons for the mosaics in that work were drawn by Mr. Walter Lonsdale, and were very effective.

Mr. Arthur T. Bolton, in seconding the motion, said that as mention had been made of the book on mosaic pavements he was asking Mr. Batsford to publish, he should like to say a few words about it. There would be ten plates, three of the drawings being on the walls before them. It would be produced by photo-lithography, and the size would be 16 in. by 12 in. It would be bound only in a stiff paper cover, as it was intended for an office book, and the price was to be as low as possible, with the same object. It would be half a guinea, and it was necessary to find fifty subscribers as a guarantee. He appealed, therefore, to members to support the undertaking by taking copies. It was hoped, as the work would show the *technique* of old examples, being all rubbings of the old work at Pompeii and Venice, it would enable architects to control the execution of their pavements, which now were, he submitted, left too much to the Italian workmen in this country. The rubbings were furnished with key-plans, and also extra patterns from Palermo and Rome, all drawn to a uniform scale for the purpose of comparison. The speaker regretted the useless and chaotic manner in which Roman-British pavements had been published. It was very desirable to establish a standard method for such publications, if architects were to make any use of them. He then pointed out from the drawings exhibited some of the technical points of their execution and design. Alluding to the mosaic work of St. Paul's, he said he greatly regretted that so great an opportunity of forming a British school of mosaic-workers was being lost. It seemed absurd to bring over all the immense quantity of mosaic that would be required from Venice. He then spoke of the way in which the work was being done at Venice, and referred to the apse of the American Church at Rome by Mr. Burne Jones as a magnificent work, making one wish that the artist had designed the mosaics of St. Peter's,—which one speaker had alluded to. With regard to the Royal tombs in the Abbey, the artist came from Viterbo, and he had seen there some tombs by the same artist on the spot. They were aware of this fact, and were very proud of it. The municipal architect was restoring the tombs, and had kindly shown him the works.

Mr. J. C. Powell said he had been exceedingly interested in the two papers which had been read. He agreed that the practice of rubbing down glass mosaics was a most pernicious one. He thought that the great difficulty in the way of achieving success in modern mosaic work consisted in the practice of laying the tesseræ face downwards before they were fixed to the wall. But there were modifications of that process which, although more laborious and more costly, were capable of better results. He also agreed with what had been said as to the futility of attempting to do anything with mosaic in small patches, such as altar fronts or reredoses; even if they did not suffer from being too near the eye, they suffered by their isolation. No mosaic work should be placed less than 14 or 15 ft. from the floor.

Mr. W. J. N. Millard said that having visited Sicily, he had been fortunate enough to see some of the mosaics of Palermo, in some of which there was what appeared to be a beautiful blue background. He chanced to be able to get up to the level of some of these mosaics, and he was astonished to find that instead of the tesseræ forming that blue ground being of one uniform tint, the blue tesseræ were varied with tesseræ in a number of shades of blue grey. That was a practical lesson which might be of some use to those who were studying the subject.

Mr. F. R. Farrow said he thought they had learnt a great deal from the two papers which had been read to them. While he sympathised to some extent with what Mr. Spence had said as to the low tones of the fashionable so-called "art-tints," he thought it should be recollected that we were at present merely in a transition state from the state of whitewash, and there was no doubt that we should arrive at something better later on. Present efforts of decoration were, in fact, in his opinion, merely tentative. Mr. Spence had mentioned the use of bronze and marble in conjunction, as being sometimes successful; but if they wanted to see a case in which that conjunction had been eminently unsuccessful, let them look at the front of the Tivoli Music Hall in the Strand, where the caps were of bronze and the pilasters of marble. That instance was an admirable example of how not to do it. Even if bronze were used in conjunction with marble for internal work, it required exceeding care; but in this climate he thought that the conjunction was utterly unsuited for external work.

The Chairman, having said a few words, put the vote of thanks, which was carried by acclamation, and the readers of the papers briefly replied.*

Advanced Class of Construction and Practice.—At the meeting of this class on Wednesday last, Mr. Walter Burrows read a paper upon the subject of "Church Roofs." The paper was illustrated by a number of large chalk and other drawings. Messrs. Edward J. Tarver and Geo. Fleetwood attended as Visitors upon the occasion, and took part in the discussion, as also did Messrs. Goldsmith (Chairman), Beale, Clarke, Brodie, Hall, and Penfold.

THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of the London County Council was held on Tuesday afternoon last at Spring-gardens, the Chairman, Sir John Lubbock, presiding.

The Blackwall Tunnel.—The adjourned Report of the Bridges Committee again came up for discussion. The recommendations of the Report were as follows:—

"(*a*) That the Committee be authorised to instruct the engineer to prepare drawings, specifications, and conditions of contract for a tunnel not more than 27 ft. external diameter, and not less than 23 ft. internal diameter, provision being made therein for vehicular and pedestrian traffic, and that tenders be invited by public advertisement for the construction of the works.

(*b*) That the Committee be authorised to empower the engineer, in preparing such drawings, specifications, and conditions of contract, to consult Sir B. Baker, K.C.M.G., and Mr. J. H. Greathead, M.I.C.E., as may be found desirable.

(*c*) That it is not desirable to proceed with the provisional works of sinking a shaft as authorised by the Council."

On the motion to adopt recommendation (*a*), Mr. Beachcroft now moved as an amendment,

"That after the word 'specification' in the first line the word 'estimates' be inserted, and that all the words after 'traffic' in the third line be omitted."

Mr. Westacott seconded the amendment, remarking that the Council ought to know what would be the probable cost of the undertaking before they proceeded to invite tenders.

Mr. Osborn (Chairman of the Bridges Committee) thought it would be most inadvisable to obtain estimates from the engineers if those estimates were to be published before tenders were invited.

In reply to Colonel Hughes, M.P., Mr. Hunter said that there would be ample room in the proposed tunnel for ordinary tramcars to pass one another.

The Chairman put the amendment to the vote in two sections, both of which were rejected by a considerable majority.

Mr. Saunders then moved a further amendment:—

"That the Committee be instructed to consider the comparative cost of (1) constructing lifts and necessary machinery and of inclined approaches, regard being had to the cost of property required in each case; (2) the annual expenditure of working and maintaining the lifts and of lighting and maintaining the approaches; and also to report whether a longer time would be required to make inclined approaches than to construct lifts, or *vice versa*."

Mr. Osborn opposed the amendment, stating that lifts would be impracticable and unable to serve the traffic. Moreover, as they had only acquired an easement to tunnel under the land on the south bank of the river, they would require a new Act of Parliament to construct lifts there.

On a division, the amendment was defeated by 53 votes against 29.

Recommendation (*a*) was then agreed to, as were the two subsequent recommendations (*b*) and (*c*).

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*In the course of the discussion, reference was made to the mosaic work in St. George's Church, Newcastle-on-Tyne, recently erected from the designs of Mr. Spence. In the *Builder* for November 15 last we gave two illustrations of the interior, showing the mosaics, which were executed by Messrs. Rust & Co. from the architect's designs.



S. SOPHIA, CONSTANTINOPLE.

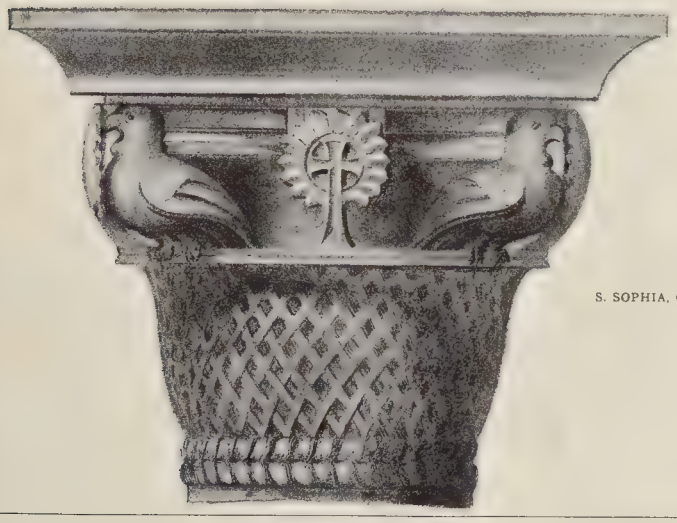


S SOPHIA, CONSTANTINOPLE

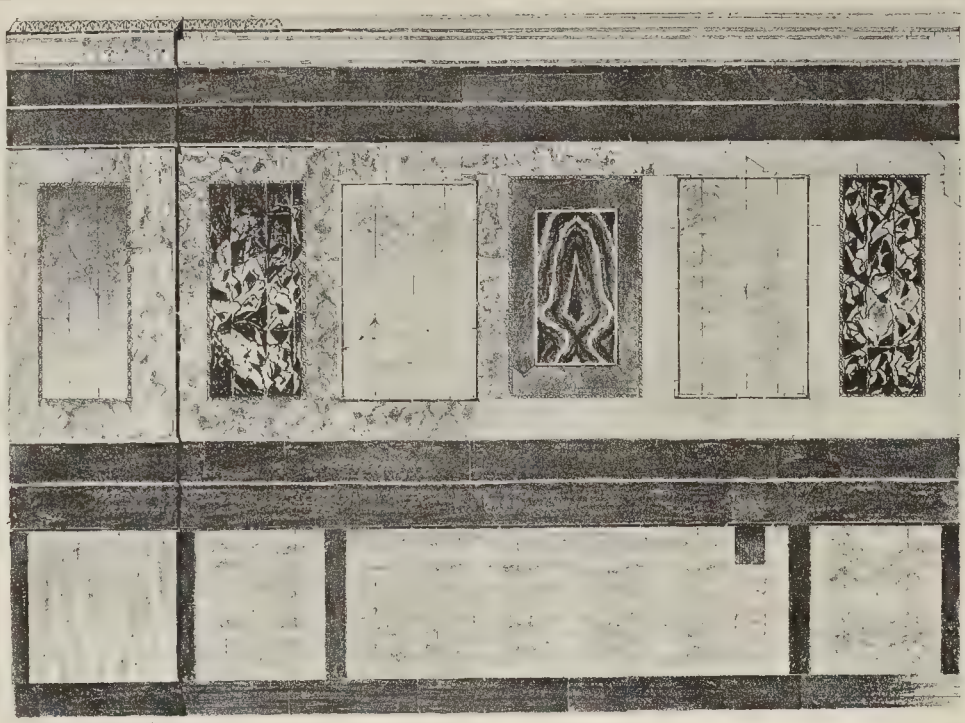


S. MARKS, VENICE

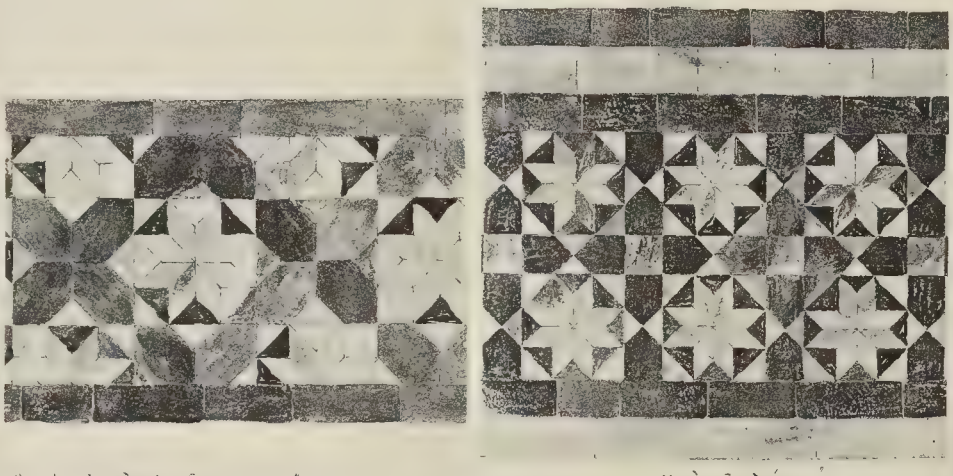




S. SOPHIA, CONSTANTINOPLE.



Μονὴ τῆς Χώρας. CONSTANTINOPLE.
MARBLE PANELLING IN NAVE.



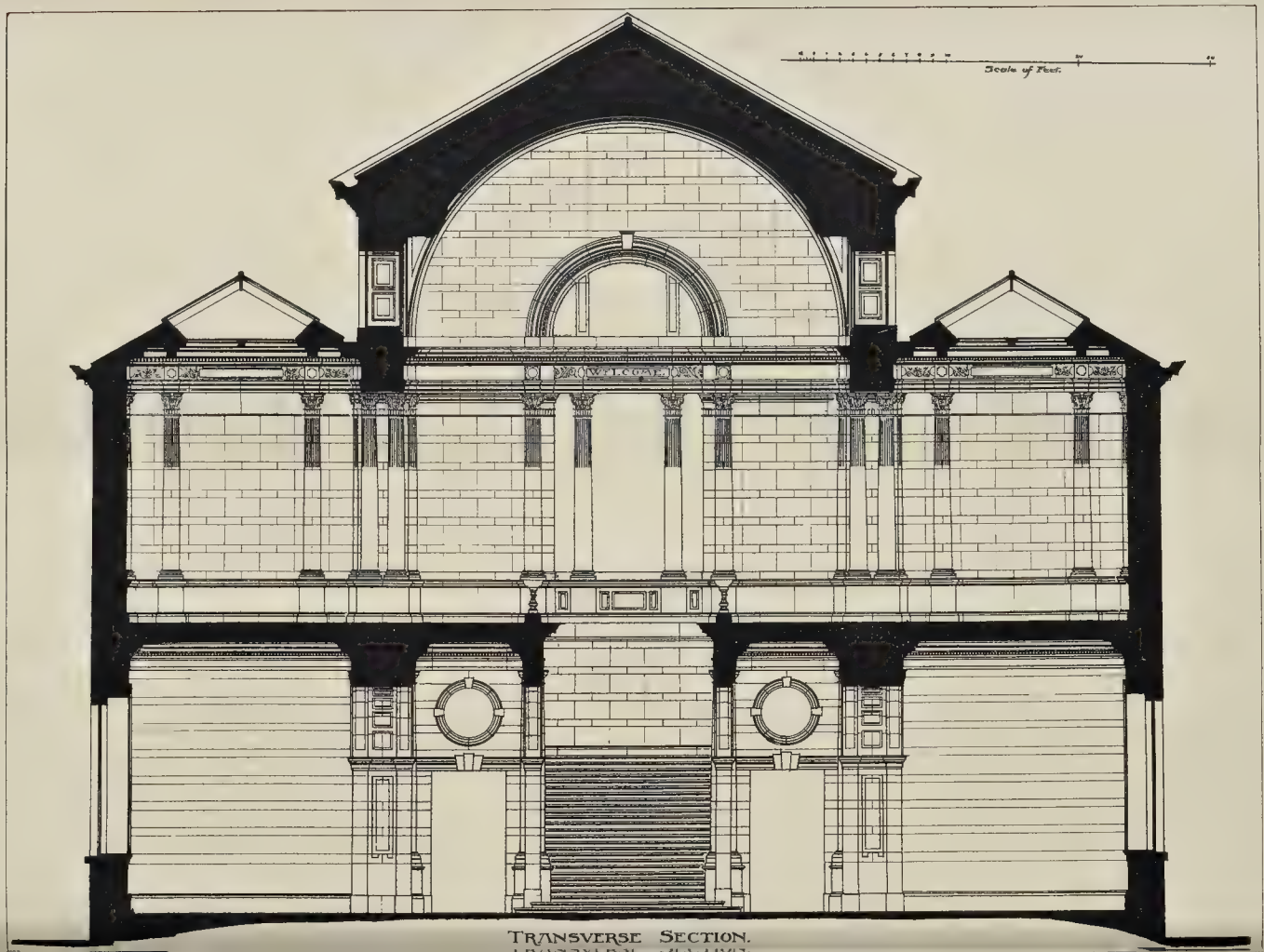
Scale of Inches

Μονὴ τῆς Χώρας CONSTANTINOPLE.
— MOSAIC FRIEZE —

Drawn by Mr Sidney H Barnsley

BYZANTINE ARCHITECTURE:

ILLUSTRATIONS TO PROFESSOR AITCHISON'S ROYAL ACADEMY LECTURES LECTURE V.

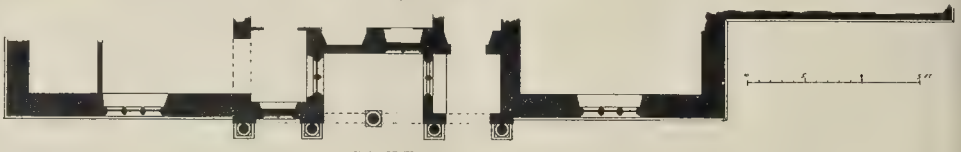


TRANSVERSE SECTION.

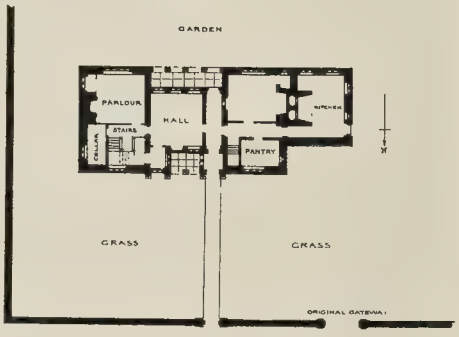




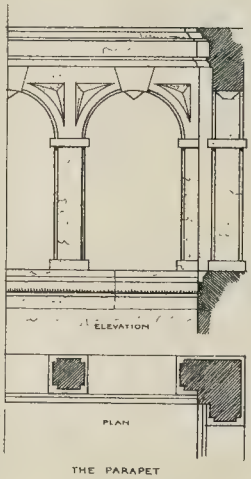
NORTH ELEVATION



PLAN OF FRONT.



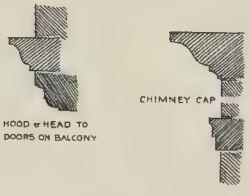
BLOCK PLAN.



THE PARAPET

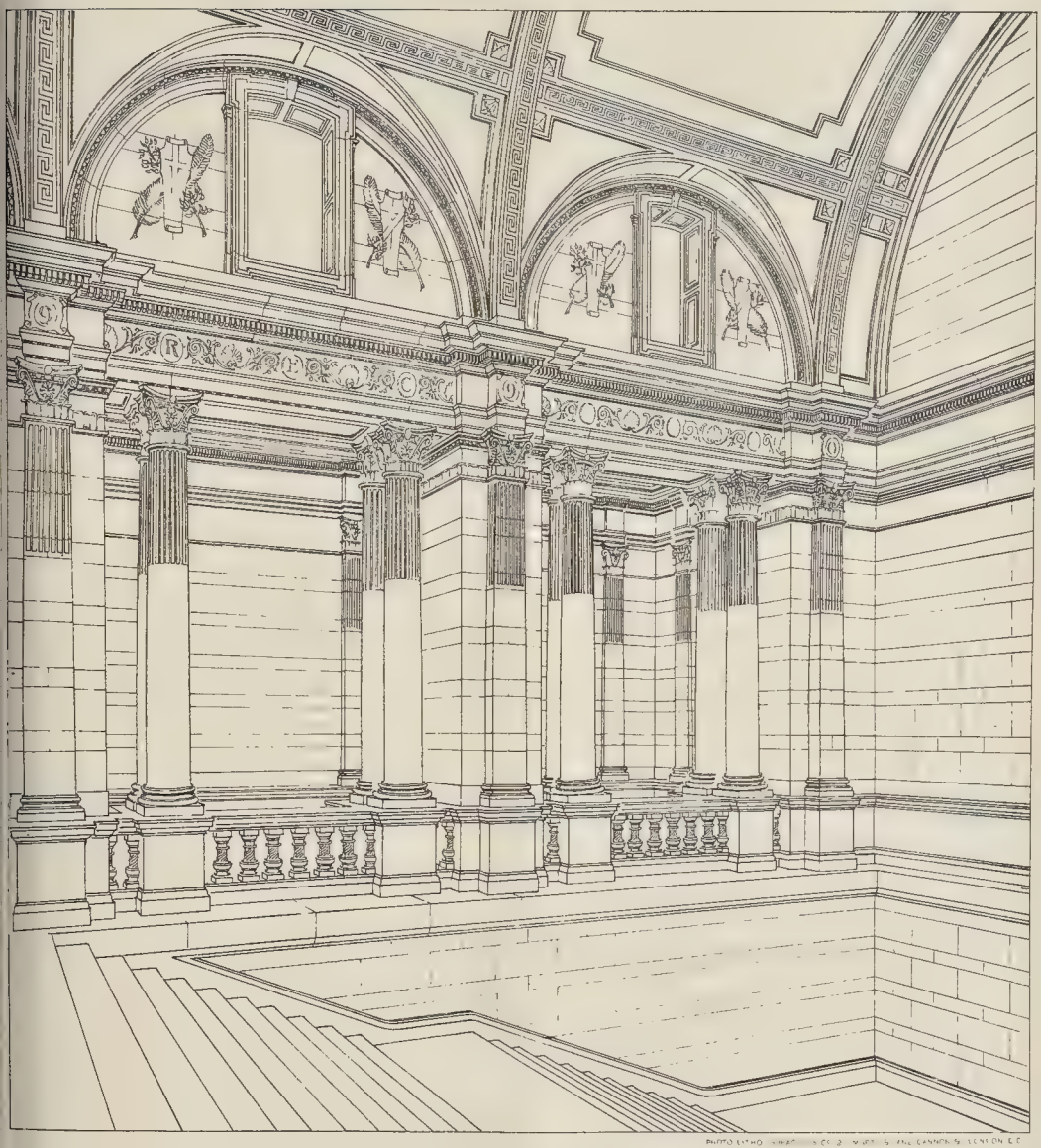


BALUSTRADE TO BALCONY



HAMBLETON OLD HALL: NORTH FRONT, PLAN AND DETAILS.

(Reduced from a plate in Mr. Gotch's "Architecture of The Renaissance in England.")

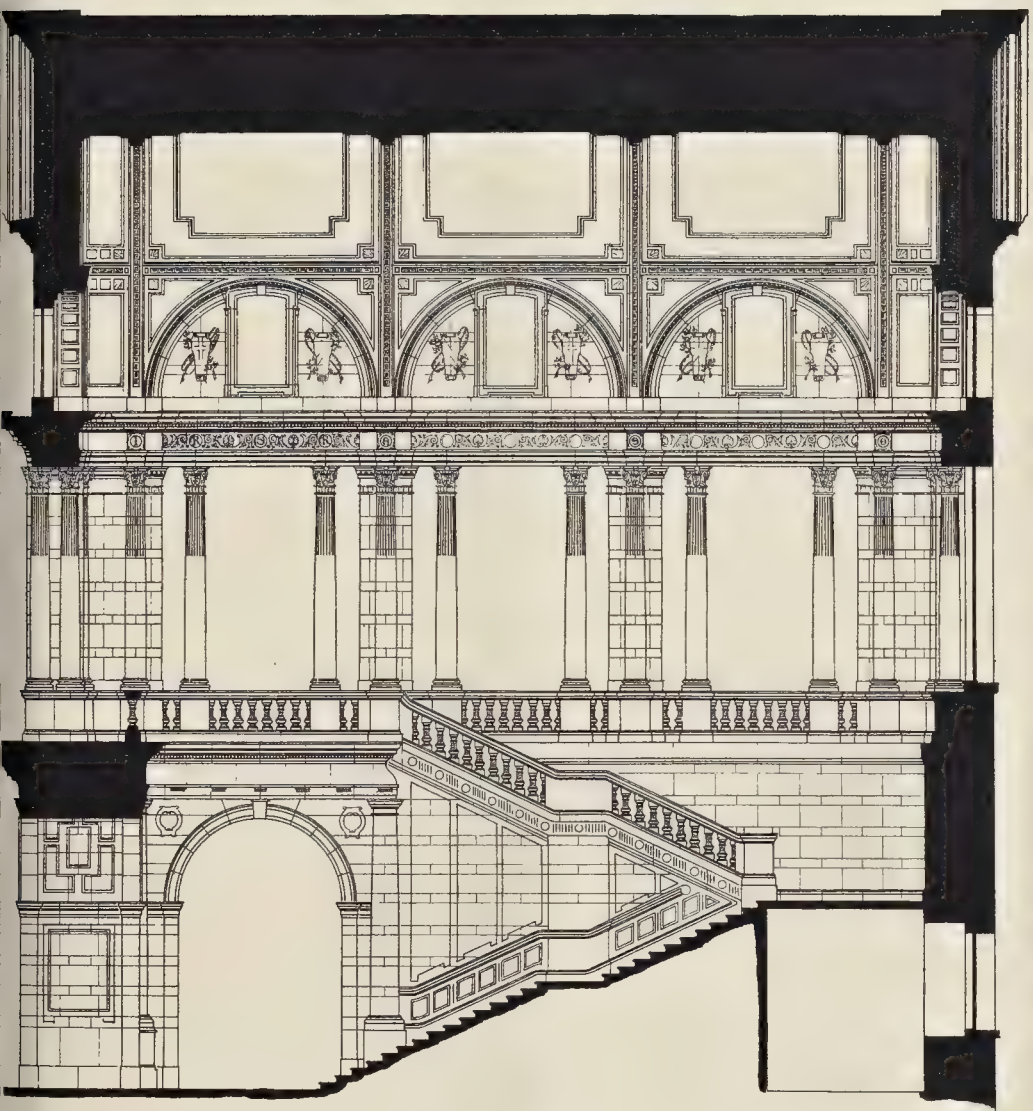


DESIGN FOR A STAIRCASE FOR A TOWN MANSION.—By Mr. T. Davison, A.R.I.B.A.

PERSPECTIVE VIEW.

ted in Competition for the "Tite Prize," 1891.

A STAIRCASE FOR A TOWN MANSION



LONGITUDINAL SECTION.

Scale of Feet

PHOTO. THOS. SINAC, E.S.C. 22 MARTINS LANE CANNON ST. LONDON E.C.

DESIGN FOR A STAIRCASE FOR A TOWN MANSION.—By Mr. T. Davison, A.R.I.B.A.

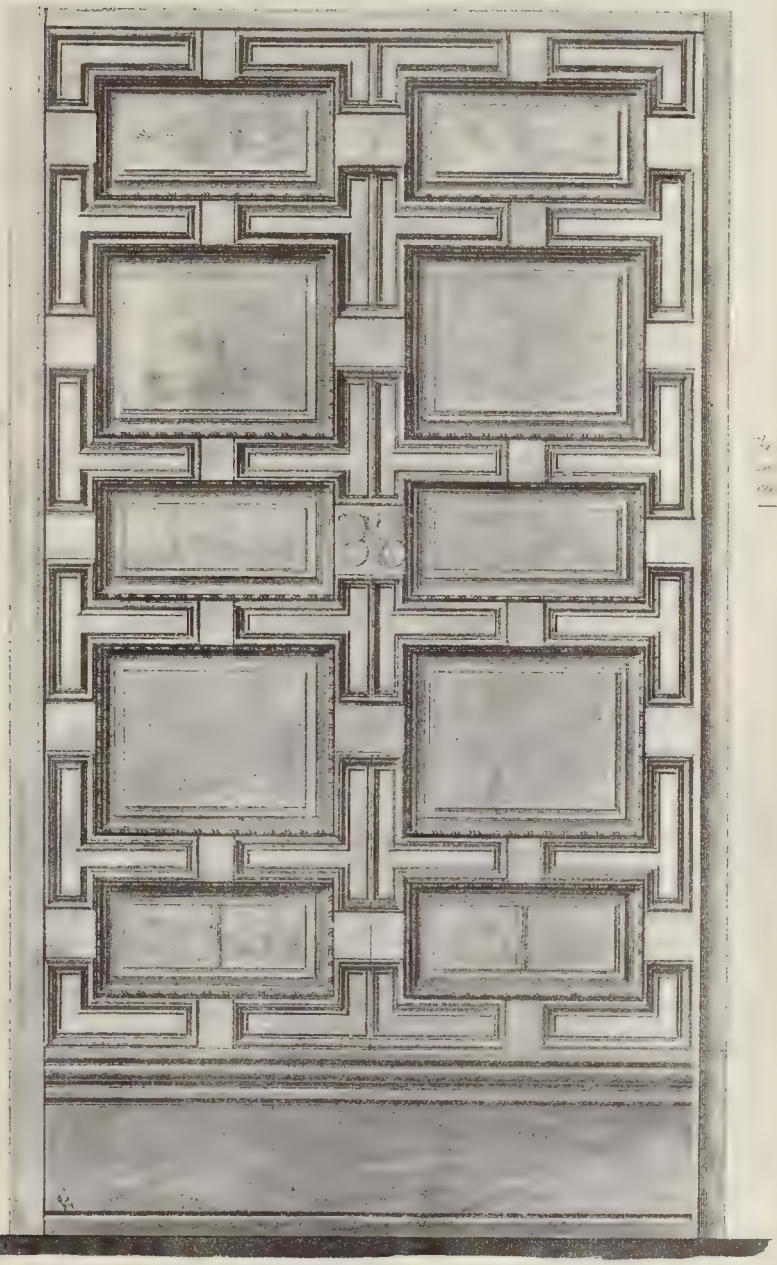
uitted in Competition for the "Tite Prize," 1891.

MARBLE DOOR now used as Jamb Linings

MONH THΣ XΩRAΣ CONSTANTINOPLE

Detail of moldings ½ full size



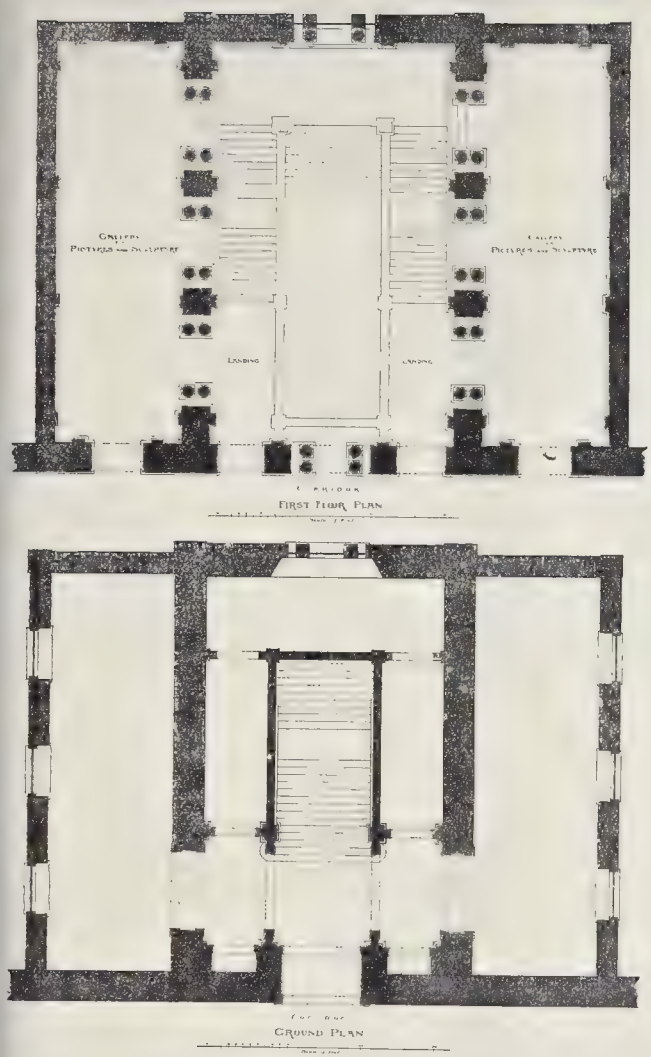


Plinth ½ full size
(Hymettian marble)



BYZANTINE ARCHITECTURE:

ILLUSTRATIONS TO PROFESSOR AITCHISON'S ROYAL ACADEMY LECTURES LECTURE V.



Design for Staircase for a Town Mansion.—Plans.

Tribunal for Questions of Line of Frontage.—The first paragraph of the Building Act Committee's Report was as follows:—

"We have to report that letters have been received from the Royal Institute of British Architects, and the Surveyors' Institution, in reply to letters sent by our direction, notifying the appointment of the Vice-President of the Institute, Mr. Arthur Cates, and the President of the Surveyors' Institution, Mr. Robert Collier Driver, as their respective representatives on the tribunal constituted under the provisions of the London County Council (General Powers) Act, 1890, to hear the appeal made by the owner of certain buildings in Flower-mews, Archway-road, Islington, against the decision of the Superintending Architect with reference to the general line of buildings in that mews, under the provisions of the 28th section of that Act."

After transacting some further business, but leaving a great deal of important matter on the paper, the Council adjourned.

ROYAL VICTORIA HALL.—The following Science lectures will be given during March at the above hall:—March 3, Prof. Marshall Ward, on "A Piece of Wood; its Origin, Structure, and Uses." March 10, Mr. J. E. Flower, on "Spain." March 17, Mr. A. W. Clayden, on "Thunderstorms." March 24, Prof. Roger Smith, on "St. Paul's."

Illustrations.

BYZANTINE ORNAMENT.

THE plates given this week of Byzantine ornament are a portion of the illustrations to Professor Aitchison's fifth Royal Academy lecture, which will be found printed *in extenso* in another column. They include wall decoration from St. Sophia at Constantinople, exhibiting the quasi-Greek leafage forms peculiar to Byzantine work, and which seem to form a link between Classic and Gothic foliage; a capital from St. Sophia, showing the basket ornament and the commencement of the convex form which in other examples of Byzantine architecture is more decidedly developed; and a conventional peacock and acanthus ornament from St. Mark's, Venice. These are from diagrams specially made for the lectures. The other illustrations, showing a marble door and some marble ornament from the building called Μονή τῆς Χώρας at Constantinople, are from drawings by Mr. Sidney H. Barnsley.

HAMBLETON OLD HALL.

THIS plate is reduced from a plate in Mr. Gotch's new book, "The Architecture of the Renaissance in England." The subject of it is referred to in the article at the head of the present number.

DESIGN FOR A STAIRCASE FOR A TOWN MANSION.

WE gave last week the design for this subject which gained the Tite prize at the Institute of Architects this year, and we now give the design, by Mr. Thomas Davison, which, though it obtained no formal award, was highly spoken of by the Council, and generally regarded as the second best of those submitted.

The materials supposed to be used in it are marbles chiefly of the lighter-coloured varieties; the ceiling to be decorated in colour with allegorical subjects in large panels, the mouldings being kept subordinate.

THE PRE-GREEK SCHOOLS OF ART:

LECTURES AT THE ROYAL INSTITUTION.

MR. W. MARTIN CONWAY, F.S.A., in the course of a series of three lectures on the Pre-Greek Schools of Art, recently delivered at the Royal Institution, devoted some time and attention to "The Beginnings of Architecture." The lecturer began, by referring to the pre-historic period. Primeval man was a hunter, and so he represented on his weapons, &c., with a natural decorative instinct, the figures of animals, which intensely interested him. Animals not only interested him, but for some he had a peculiar respect and veneration. These were the totems, the sacred animals of his tribe or kindred. Sometimes they were kept as pets, sometimes an idol or image of them was set up. One of the earliest forms of temples consisted of the hutches for tame totems, or the shrines for their images.

The belief in the ancient world that the spirit or ghost of man continued, after death, doing the same things he had been accustomed to do during life, resulted in the custom of offerings to the dead, the so-called ancestor worship, and of making tombs exactly in the form of the house or cave in which he had lived. Thus the ordinary home of early man became one of the chief temple types. The early forms of general hospitality also influenced this. The normal abode consisted of two parts,—an outer, or public, and an inner, or private place. The outer was the guest-chamber; the inner, the family or private apartment. The outer temple chamber or court corresponded to the outer chamber of the house, and became the guest-chamber of the god: hence probably arose the right of sanctuary connected with temples. The chief fire burned on a hearth in the midst of the outer chamber of the house: Domestic worship was practised in early times, and this not without an obvious fitness became associated with the hearth. Thus the hearth came to be regarded in the house of the chief as the tribal altar, and so resulted in the temple the altar of the god. We find, therefore, the ancient temple planned like a house, with an altar in its outer hall or court, and a shrine in its private chamber, and all situated within a sacred enclosure.

Architecture took its rise from the cave-dwellers, and the earliest buildings were imitation caves. The first building materials were doubtless wood and earth; with the introduction of metal began the building with shaped stones, and afterwards, with better appliances and co-operation in labour power, developed the tendency to build on an increasingly large scale, and so we have the huge sepulchral chambers, the monoliths, &c.

In his second lecture Mr. Conway referred to the architecture of early Egypt. He showed how the earliest known form of Egyptian religion was founded on totemism, and that the early Egyptian race was a commingling of separate totem tribes or kindreds. He thought that the earliest Egyptian civilisation took its origin in influences imported from the East by way of the Indian Ocean and Red Sea into Upper Egypt.

There are indications of greater antiquity for the foundation of temples in the Theban neighbourhood than for those in Lower Egypt, and the tradition ascribing the foundation of the temple of Ptah at Memphis to a man from Upper Egypt is deserving of attention.

The earliest Egyptian architecture was of wood. No examples of this are left to us. The existence of a wood architecture in the time of the ancient empire does not admit of doubt; the paintings and sarcophagi show this, but as Egypt has always yielded little wood, it must have been an imported commodity. The building materials of the country were two—first mud, and from this sun-dried bricks second

excellent stone. The aborgines, doubtless, dwelt in wicker huts plastered with mud, as the fellaheen do to-day. A stone architecture developed from this; that the upper classes of the ancient empire dwelt in wooden structures shows their foreign extraction. The greater proportion of early wooden statues over stone also points to this.

Although foreign elements may lie at the basis of Egyptian forms and processes of art, the Egyptian idea arose, as it were, from the soil and resulted from a reaction of the physical circumstances of the surroundings of the inhabitants. There are no instances of great rock sculptures before the days of the new empire.

Excepting the wooden traditions of the wealthy, most of the early Egyptian buildings were of sun-dried bricks. Owing to the weakness and compressibility of the material, the walls of a mud-brick building must have been thicker at the foot, and naturally the outer surfaces would have slanted upwards. The angles, the weakest parts, were strengthened by a bundle of sticks, or a post of wood. The cheapest form of roofing would be of reeds covered with mud. The ends would stick out, and give the effect of a rough moulding forming a decorative finish to the walls.

All the necessary features of a mud-brick building were copied in the stone architecture of the country, and are its normal characteristic features. The attempt to imitate in one material forms proper to another is the foundation of advance in architecture and not an esthetic vice.

The plan of the normal Egyptian temple is very simple. Entering through the main gate in the great facade you pass through an open courtyard into a hall of columns. Beyond is the private chamber of the god. The inner portion is wholly dark and is surrounded on all sides by a passage giving entrance to a number of chambers all round. The holy of holies is thus an entirely separate chamber, dark, and surrounded by a dark passage. It lies under the same flat roof as the inner part of the temple, but its walls usually have an outside batter or slope, like external walls of mud-brick structures, and they are surmounted by the moulding called the Egyptian gorge. This indicates an edifice originally standing free in the open air in the midst of a sacred enclosure,—the old shrine of the totem folk, which, as a type, had become irrevocably fixed. These shrines are portrayed on early hieroglyphics exactly of this form, built of mud and plaited reeds, strengthened with wood posts at angles, and crowned above with a kind of fringe of the ends of the reeds, the original of the gorge moulding. A paling marks the limit of the sacred enclosure.

In the Middle Empire, Egyptian architecture reached its first period of greatness. No building of that period has, however, come down to us, and it is from the rock-cut tombs of Beni Hasan, Assiout, Assouan, &c., that we can form a sound judgment, and from relics unearthed by Mr. Flinders Petrie in the Fayum, from the ruins of a town occupied by the builders of a pyramid and temples of a king of the twelfth Dynasty, and which was deserted at the completion of the work. The objects here found must date from about 2500 B.C. Mr. Petrie found many small pillars, probably household altars, in the form of columns with bases and capitals. These show us that at this early period every known type of Egyptian column had already been invented.*

The Hyksos invasion did not end the great period of Egyptian architecture. The style was a product rather of Upper Egypt, and it was Lower Egypt that suffered most from the Hyksos. So when, in the eighteenth Dynasty, Upper Egypt again came to the front the style revived in all its splendour. The decline, however, soon set in, and, Mr. Conway said, all the works of Rameses the Great are frightful monstrosities, worst of all being the Ramesseum and the Great Hall of Columns at Karnak. The vice that destroyed the style was the desire for extravagant dimensions.

Under the twenty-sixth Dynasty all the arts revived; and later, in the reigns of the Ptolemies and the Roman Emperors, the last great school of Egyptian architecture flourished, and in it the ancient traditions of Egypt were still maintained, although Greek influence had crept in to some extent.

Architecture was, *par excellence*, the Egyptian art which influenced the Greeks. Mediterranean folks were in Egypt as early as the twelfth Dynasty. There were plenty of them there in the nineteenth, and in the Mycenæ tombs has been found Egyptian pottery of the eighteenth Dynasty. The fundamental idea of the Doric style was borrowed from Egypt; but for the architecture of Egypt the Parthenon could not have existed.

During the course of Mr. Conway's third lecture, which was on Chaldea, he referred to the antiquity of Chaldean civilisation, which he said was in an advanced state in the reign of Sargon I., B.C. 3800. He pointed out the common origin of the Egyptian and Chaldean civilisations from the bronze-using people of the south of Asia. He described the remarkable series of sculptures found by M. de Salzec in the ruins of Lagas. They were set up by the architect, King Gudea, to represent himself for ever in the Temple of Nin-girsu, his god. In one of them the king is represented seated, with drawing-board and cubit measure on his knee. They show minute study of the living model.

The plan of Sargon's temple at Khorsabad, being the same in general arrangement to the house of the kings at Tiryns, shows the similarity of the social structure of these different peoples.

* We hope in a later issue to give drawings of these interesting objects.

LECTURES AT UNIVERSITY COLLEGE.

On Thursday, the 19th inst., Professor Poole delivered the fourth* of his lectures on Greek Archæology, his special subject being the various local schools of Greek art. After recapitulating his former statements as to painting and sculpture in Greece, he pointed out the difference that exists between styles and schools. In architecture this distinction is plainly traceable; in succession we have many styles till the Renaissance. We see the Gothic, &c. But if one goes to Spain or Italy a good architectural book must be consulted; because, although we see the same succession, there do not seem to exist the same laws. Professor Poole showed how the architecture was necessarily different where the shadows fall horizontally or vertically. Strong cornices, for example, were to be found where the sun was strong, and more delicate where the reverse was the case. Even in Oriental (Arab) architecture we find the same laws and the same succession. In painting there were half-a-dozen distinct schools in Italy, and any man who was conversant with art could say of one, "This is Roman," and of another, "This is Sicilian." In England we have the same thing; we have, for example, the Norfolk school, and what we may even term the London school. The question may be asked, Why are people generally so ignorant as to the great schools of ancient art? The lecturer said that it might be owing to the difficulty of examining small coins. Painting did not influence sculpture in the round, but in the relief. We have that influence extending from 404-330. Turning to the school of Central Greece, he illustrated it by referring to several works, such as the eagle on the shield, in which the artist had succeeded admirably in placing the animal in the best position to display the splendid spring of the back and to show the beak in its best aspect. The second period,—that of painting,—seemed to have more emotion and less character than the first period, that of sculpture predominant. In Athenian art we have Hercules represented with wonderful grace, while in the Cretan representations, which were much more naturalistic, the whole idea seems to have been to exhibit his strength. In the Cretan representation of Europa we have the sacred bull biting its hide when it has been stung by a gadfly, while in the other school we have the "butting bull." The Athenian artist is much more repressed in his treatment of his subject than the Italian coin engraver who played with his theme much more freely. Greek artists never copied; they may have acted on a reminiscence, but there was never slavish copying; they always went to nature. This might be seen from the various representations of Nikè, the goddess of Victory; all like each other, but constantly varied. Prof. Poole said that if he took his students to Greece, they would find more than they could see; if they went to Italy or Sicily only coins were to be found. Sicily had an art peculiarly of her own. Like the Italian, it was small and more ornamental than the others. Its gem engraving was deeply interesting and effective. There were three coins of Syracuse which had very fine representations, and these were the result of great outbursts of artistic power at periods when the oppressors were overcome. The art there was very like that of Greece, and was marked by a peculiar *naïveté*. Professor Poole concluded by referring to what might be termed the semi-barbarous schools, and spoke of the possibility of still further dividing the schools of Greek art than he had done; while he impressed on his audience the great importance of the study of the subject on which he had dwelt.

* For brief reports of the previous lectures see pp. 70, 127, 149, *ante*.

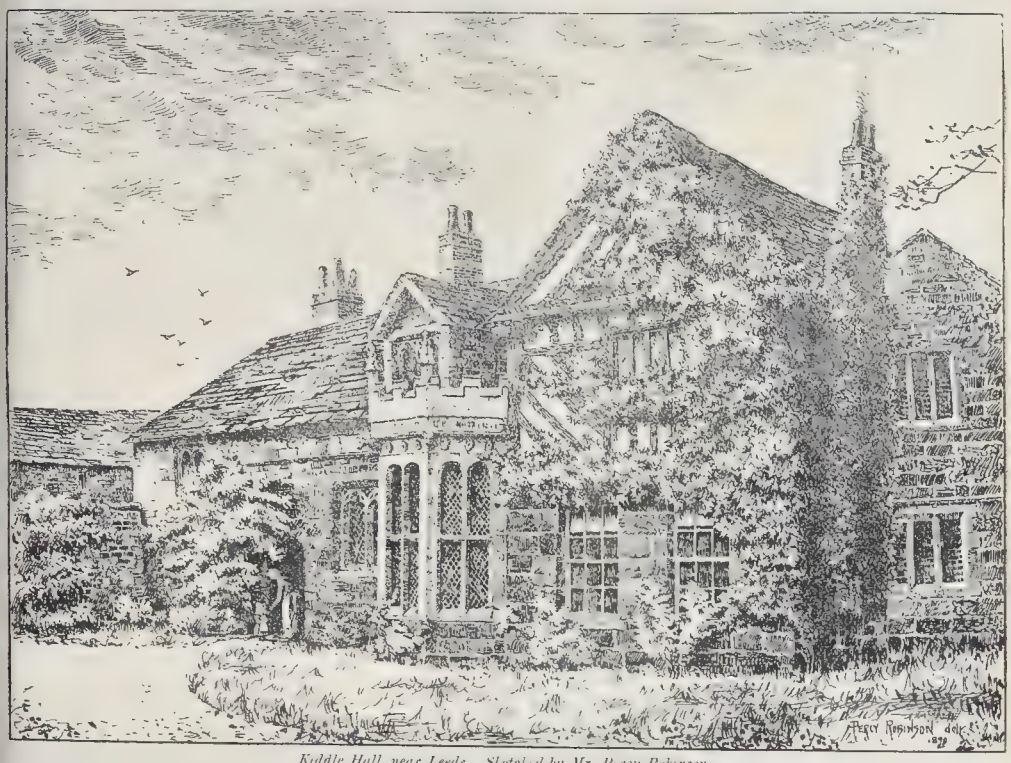
THE SANITATION OF SCHOOL-BUILDINGS.

On the 18th inst., Mr. W. P. Buchan delivered his address as President of the Sanitary and Social Economy Section of the Philosophical Society. Dr. M'Kendrick occupied the chair, and the subject was "The Progress of Sanitation," with particular reference to the condition of Glasgow public schools. Dealing with the progress made in sanitation since 1850,

Mr. Buchan said that while they had made great strides in many departments of this science, there was one in which they in Glasgow had lagged behind. He alluded to the ventilation of our buildings, whether these be houses, churches, halls, or schools. Scarcely any houses had a systematic means for ventilation provided, while the condition of many of our churches was not only disagreeable to the worshippers, but a disgrace to them. Having complained of the ventilation of the City Hall, Mr. Buchan proceeded to refer more particularly to the ventilation of our public schools. After visiting a number of the Glasgow schools, the conclusion that he had come to was that he could not understand how the Board allowed the ventilation to be carried out in so unscientific and unsatisfactory a manner. It would have been expected that, considering the costly character of the buildings and the uses for which they were erected, that such a vital feature as the ventilation would have been specially attended to, and that by an expert; but no evidence of such could be seen, even although the Board had often taken this matter out of the hands of the architects. The Chairman of the Board, at the opening of the last new school, in November last, had stated that they had had no experience in Glasgow of the shoddy work which was alleged to have been passed off on other Boards. After seventeen years, he (the Chairman) could say that not one of the schools erected had proved anything but satisfactory. Mr. Buchan said that, while their outward appearance was generally good, it was questionable if they could stand the same scrutiny that some of the London schools had recently undergone and come out scathless; for his own part, after personally examining a number of them,—including the newest,—they reminded him of "goodly apples rotten at the heart." A number of the country schools which had an improved an ample provision for ventilation had had that carried out at his suggestion. There were still others where the ventilation was a mere sham, and these ought not to get any Government grant till improved. He would not be surprised though the bad sanitary environments of the schools was one reason for the seeming increase of bad eyesight of a large proportion of the rising generation, and Glasgow schools must not be permitted to continue the nurseries for influenza, consumption, and other health and life-destroying influences. A country school of only one flat might be well ventilated automatically easily enough, but this was not the case with large three-flatted schools like many of those in Glasgow. He had the plans of the new large three-flatted school at Cubie-street sent him by the Glasgow School Board to see what scheme of ventilation he would recommend. He had advised mechanical power to be used, either wholly or partially; it would be seen by-and-bye whether or not the Board make a better job of the ventilation of this school than of the others.

Surveyorship, Builth.—Mr. Telfer Smith, architect and surveyor, Builth, was appointed Surveyor to the Builth-Wells Local Board at their last monthly meeting.

Remarkable Runic Stone.—On a farm, Opedal, in Ullensvang, Hardanger, Norway, a very remarkable Runic stone has just been discovered, the runes number thirty-four, and the inscription is about 1,600 years old. Professor Sophus Bugge, of Christiania, the well-known Runic interpreter, is engaged in deciphering the inscription.



Kiddle Hall, near Leeds.—Sketched by Mr. Percy Robinson.

KIDDLE HALL.

THIS interesting and picturesque specimen of old domestic work is situated on the Leeds and Tadcaster-road, about eight miles from Leeds. It was for many centuries the residence of the Ellis family, by whom it was probably built, but is now occupied by a farmer. The most interesting feature about the building is the peculiar shaped bay-window. This is of later date than the main building, being fifteenth-century work, as the following inscription which it bears, shows:—

"Orate pro bono statu Thom Elys
Et Anna uxoris
Sue qui ista fenestra fecerunt
Anno D.M. M.C.C.C.C., P.M."

Beneath this inscription is a cornice, enriched with various symbolic ornaments and devices, and having at each angle a grotesquely-carved gargoyle, and above is a battlemented parapet with pinnacles, enriched with a trailing pattern of vine-leaves and grapes.

There are also some interesting features in the interior, chiefly old oak work of the Georgian period. PERCY ROBINSON.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At the meeting of this Association on Tuesday last, Mr. T. Naden in the chair, Mr. A. T. Bolton, A.R.I.B.A., read a paper on "Italian Pavements and Mosaics." In the discussion which followed the paper, Mr. Naden said he wished to speak in the highest possible praise of the excellent drawings with which Mr. Bolton had illustrated his subject, and expressed the opinion that such descriptions as Mr. Bolton had given of the Italian pavements were the best of means for arousing interest in the subject, and for preventing the present-day commercial spirit from entirely overcoming the artistic efforts of artists.—Mr. Bidlake, who also spoke in praise of Mr. Bolton's drawings, said that in his opinion workmen often failed to produce an artistic effect from their placing too great importance on mechanical accuracy.—Mr. C. E. Bateman said that the enthusiasm and thoroughness with which Mr. Bolton had treated his subject were what was needed to arouse enthusiasm in others, and expressed the hope that Mr. Bolton would be persuaded to take up the subject of English mosaics in the same way that he had done the Italian.—Mr. Beck and Mr. Ward also spoke, and after a hearty vote of thanks had been unanimously passed to Mr. Bolton, the meeting closed.

GLASGOW ARCHITECTURAL ASSOCIATION.—On the 17th inst. Mr. G. S. Aitken delivered a lecture to the members of the Glasgow Architectural Association on "Architecture in Relation to Social Problems." Mr. W. J. Anderson occupied the chair. In treating this subject the chief points referred to by the lecturer were the opportunities for furthering the well-being of society that fall to the lot of the architect when he is called upon to carry out any scheme for the housing of either the industrial part of the population or the nomadic section. Turning to what might be esteemed some of the essentially practical parts of architectural work, reference was made to sanitation and to the fact that in the eagerness to make sure that all was sanitarily right, utter disregard was often shown to the architectural treatment of sanitary features. The smoke question was considered, and the idea propounded of the possibility of supplying heat in the future as water, gas, and electricity are at present. Pure water supply was another matter discussed, and the suggestion was made that it would be very much better if glazed earthenware cisterns were employed instead of lead and galvanised iron, if the difficulties of making them large and light enough, and providing for the due connexions were overcome. The means of disposing of coal ashes in tenemental houses were touched upon, the use of a properly-constructed dust-shoot was advocated, and the dust-bin system that obtains in the Glasgow model dwelling-houses was also alluded to. Other branches of architectural work that engage the attention of the professional man were considered, and, in conclusion, it was advanced that only by recognising architecture as a useful art could the success of its future be assured. Architecture pursued merely for its own sake was doomed to failure.

ENGINEERING SOCIETIES.

LIVERPOOL ENGINEERING SOCIETY.—The seventh ordinary meeting of this society for the present session was held at the Royal Institution, Colquitt-street, on Wednesday evening, February 18, Mr. James Morgan, Vice-President, in the chair. A paper, entitled "Foundations," was read by Mr. H. G. F. Barham. The author in his paper first dealt with trial borings for foundations generally, and then passed on to a description of foundations on rock and firm ground, including the excavation of sumps, timbering, and the preparation of rock surfaces. The paper then dealt with the various methods of forming foundations on soft ground. A description followed of foundations laid under water, first, by excluding the water by means of dams and coffer-dams, and, secondly, without excluding water, by the use of various forms of concrete. The paper terminated with a consideration of pile foundations, pier sinking, and pneumatic foundations.—A discussion followed, in which various parts of the paper were commented upon, and a vote of thanks to Mr. Barham terminated the proceedings.

THE JUNIOR ENGINEERING SOCIETY.—A meeting of this society was held at the Westminster Palace Hotel on the 20th inst., when papers were read by Mr. J. B. Ball, Stud. Inst. C.E., and Mr. Albert Wollheim, Stud. Inst. C.E., on "Carriage Way Pavements in Large Cities," and on "The Design and Construction of Sewage Precipitation Works." There was a large attendance of members and visitors, and animated discussions ensued. Mr. Ball briefly described the essential features of a good carriage-way pavement, pointing out the absolute necessity of a proper foundation. The transverse section and gradients were dealt with, and the author advocated the use of subways for sewers, gas and water-pipes, electric wires, &c., and referred to the importance of frequent cleansing of the streets. Mr. Wollheim, in his paper, drew attention to the salient points which should govern the design of sewage precipitation works, and proceeded to describe pumping machinery and various apparatuses for adding the chemicals,

especially emphasising the necessity of each apparatus being automatic in its action. The want of a night storage tank was also pointed out. Some recent important experiments by Mr. Lindley, M.Inst.C.E., of Frankfort, on the displacement of water in tanks, were referred to, and the principles of the design of settling-tanks were considered.

FREE LECTURES TO ARTISANS AT CARPENTERS' HALL:

PROFESSOR ROGER SMITH ON "FAILURES IN BUILDING.'

The second* lecture of this year's series of free lectures to artisans was delivered at Carpenters' Hall, London-wall, on Wednesday, the 18th inst., by Prof. T. Roger Smith, F.R.I.B.A, Mr. Waterhouse, R.A., P.R.I.B.A., was in the chair.

The lecturer, in his opening remarks, said that he used the word "failure" to imply some giving way of a structure. In citing examples of failure with the view of deducing lessons therefrom, he should, for obvious reasons, refrain from mentioning instances of failure which might affect persons still living; but omitting all such cases there was a large field open to observation. Nearly if not quite forty years ago, he had the opportunity, as a young student, of visiting the scene of a disastrous calamity. At the Bricklayers' Arms Station of the South-Eastern Railway an extensive yard had been covered in by roofing carried on a multitude of columns, and the roof had collapsed. Some accident (he believed it was an engine getting off the line) threw down one column. With that column fell down the bay of roofing that it supported; that brought down the next column, and that the next bay, and so on until the whole structure came down like a house of cards. For engineers and railway managers the failure was a warning that many intermediate supports to a station roof were a source of danger, and they were therefore afterwards avoided as much as possible. There was, however, another circumstance connected with the failure which was very instructive. There was a latent defect in the framing. The struts of the trusses, which were simple iron trusses, were too short, and in putting them together, the trusses were so tightened-up as to be weakened instead of strengthened by the framing. This fact would serve to explain why the whole roof gave way so completely, but it was a feature of the case which was not, he believed, generally known at the time. This great failure occurred at a time when the South-Eastern Railway was about to reconstruct its terminus at London Bridge, and before our present experience of iron roofs of large span had been gained. It was determined to roof the new station at London Bridge with a roof covering the entire series of platforms in one span, so as to avoid all columns, and it was also determined to construct the roof of fir timber. That roof, too, was a failure. True, it was standing at the present moment, but every truss was now supported by a timber post near the centre of the span, showing that the framing had sagged. The lecturer then went on to consider the cause of the failure of the trusses of this roof, which was of the queen-post type, with a span between supports of 92 ft. He attributed the failure of the roof to the comparative lightness of the scantlings of the timbers used, to the flatness of the pitch, to the placing of the trusses rather too far apart, and to the softness and comparative flexibility of fir timber. Having referred to the failure of the Great Northern Railway Terminus roof at King's Cross, whose main supports consisted of semi-circular ribs, each built up of laminated timbers, but which have of late years been replaced by wrought iron ribs, as described in the *Builder* at the time, Professor Roger Smith referred to the roof of the old hall at Eltham Palace. This roof had a span of only 36 ft. as compared with the 68 ft. span of the Westminster Hall roof. It was heavily timbered and framed in oak, yet it had spread and thrust out the walls,—partly owing to its flat pitch, but chiefly owing to the foot of the principal rafter coming down on to the hammer-beam inside the line of the wall instead of well back from that line. There was thus little to prevent the free end of the hammer-beam from dropping, and so dislocating the whole framework. If one compared the foot of the rafter at Eltham with the same part of the Westminster Hall truss,—bearing in mind that the hammer-beam was a lever, that the fulcrum was the top of the wall-post, and that the weight of the principal rafter on the short end of the lever was what ought to keep the long end from dropping,—one would see how inferior was the skill of the carpenter who designed the Eltham roof to that of the earlier designer of the Westminster Hall roof. The lecturer next proceeded to enumerate some of the many failures which were constantly occuring in buildings owing to injudicious alterations or to inherent defects in the carpentry,—defects which were sure to be intensified by ignorant tampering with the work. A very common cause of failure in buildings was the making of alterations which increased the load to be carried by the foundations and walls of a building or of part of a building. It seemed very natural to suppose, when a weight had been carried steadily, and with no sign of bending or bulging or cracking, that there was a reserve of strength in the structure and in its foundations, and that more weight might very safely be put on. It might often be so, but it often turned out that the idea was mistaken,—that the addition of a new load disturbed what was quite quiet before, and induced signs of failure, either in the foundations or the structure. Alluding to the accident which happened at King's College in 1869, in that part of Somerset House occupied by the College, under the river-terrace, the lecturer pointed out that that accident illustrated the danger of the use of badly-designed cast-iron girders, of tying such girders into the walls, and of sapping the foundations. In this case, the construction either of the low level main sewer, or of the Underground Railway, had probably affected the foundations by the abstraction of water by pumping. In this connexion the lecturer said it was possible for causes much less apparently formidable than continuous pumping or the cutting of a deep sewer to produce the most serious results on the stability of buildings, and especially on clay soil on a hill-side. He mentioned two cases of this kind which had come under his notice,—one from letting water in, and the other from drawing water off. Now and then failures occurred in buildings owing to fraudulent or negligent construction. Without saying anything as to failures due to fraudulent construction, it was unfortunately the fact that carelessness and stupidity were sometimes almost as formidable in their consequences as positive fraud. So many persons were careless, and so many deficient in common sense, that he would strongly impress upon all who had to superintend buildings the necessity of minute supervision and unceasing vigilance.

* For brief report of first lecture, see p. 151, *ante*.

The third lecture of the series was delivered on Wednesday evening last by Prof. Marshall Ward, M.A., F.R.S., who chose as his subject, "Timber, its Growth and Decay," with lantern illustrations. Sir J. C. Lawrence, Bart., presided, and there was again a good attendance.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

The twenty-fourth annual general meeting of the donors and subscribers of this Institution took place on Tuesday evening last at the offices, 21, New Bridge-street, E.C., the President-elect, Mr. Benjamin Hannen, jun. (Messrs. Cubitt & Co.), in the chair, supported by Messrs. Thos. F. Rider and Wm. Robert Freeman, (Vice-Presidents), and by Messrs. E. Brooks (Treasurer), C. K. Turpin, E. B. Gammon, A. Stansfeld, G. C. Harrison, H. W. Parker, A. A. Stanger, and other gentlemen. Mr. H. H. Bartlett, the retiring President, was present part of the evening, but had to leave early in order to fulfil another engagement. Letters were read from Mr. E. C. Roe, B. C. Fox, and others, who could not attend. Mr. John Howard Colls also conveyed his regrets at not being able to be present.

The Secretary read the report, which stated that the income for the past year amounted to a total of 672*l.* 11s. 9d., and consisted of 294*l.* 9s. 6d. in subscriptions, 277*l.* 2s. in donations, and 101*l.* 0s. 3d. in dividends. The expenditure was 489*l.* 12s. 3d., including 385*l.* payments to pensioners. The number of pensioners on the books was nineteen, but one of the number having resigned owing to improved circumstances, there was a present total of eighteen, thus leaving a vacancy on the pension list. With regard to the Orphan Fund, as one of the children had completed her school term, there was a vacancy for another child. The annual dinner took place at the Holborn Restaurant on March 31, 1890, at which Mr. H. H. Bartlett presided. As the result of his appeal on that occasion, donations, &c., to the amount of 310*l.* were announced. Large numbers of clerks again attended, many of those who had not before assisted subscribing to the funds on the occasion. The amount of funds invested stands at 3,650*l.* (1,700*l.* being to the credit of the Relief Fund and 1,950*l.* to the Orphan Fund). The Committee thank Mr. H. H. Bartlett for his services as president during the past year, and announced that Mr. B. Hannen, jun., had kindly consented to become his successor. The Committee also thank the builders, architects, and merchants for their steady support, and express a hope for the continuance of the same.

The balance-sheets were then read by Mr. E. Brooks (the Treasurer).

The President-elect, in moving the adoption of the report, said that when he was first spoken to as to becoming President, he had some diffidence in meeting the Committee's wishes, but as he felt that it would be an honour to follow the long list of gentlemen who had occupied that position before him, and as he felt he should have the cordial support of the Committee, he had accepted the invitation. He believed the Institution had done, and was doing, a noble work; still, he thought there would have been more applications, and the fact of there not being more seemed to admit of one of two explanations,—either the Institution was not as widely known amongst builders' clerks as it should be, or else builders' clerks were very rich; but, if the latter, it seemed difficult to understand why more clerks did not support the Institution than at present. In Mr. Freeman's year, he believed, some proposals were made for reducing the amount of the annual subscription. To some clerks a guinea might seem a large sum, and he thought if the scale of subscriptions was arranged so that 5*s.* would give one vote, while for a guinea five votes could be given, it would be an inducement for more clerks to join. He also thought if each member could canvass the clerks the subscriptions would be greatly increased,—sufficiently so, in fact, to pay the pensions. Last year the subscriptions were not sufficient for this alone, the amount being made up from donations, and supposing a bad year, it might be needful to withdraw some of the capital. He thought, as he had said, that if the Committee could go amongst the clerks they would get a large sum. If the Institution had a weak point, it was the smallness of the number of clerks subscribing; he trusted to see an advance in that respect, so that the Institution might be able to help a greater number of those who might need its assistance.

Mr. T. F. Rider seconded the adoption of the report.

Mr. W. R. Freeman (Messrs. Mowlem & Co.), in proposing a vote of thanks to Mr. Bartlett and the other retiring officers, spoke of Mr. Bartlett as being a very able man and well able to carry out, as he was sure he had done, the duties of the Presidency. The Committee also had done their work ably and carefully, and he well remembered during his own year of office with how much thoroughness the work had always been gone through.

The resolution was seconded by Mr. Brooks and carried unanimously.

Officers for the ensuing year were then elected, and the meeting closed with a cordial vote of thanks to the Chairman.

Correspondence.

To the Editor of The Builder.

SOUTHAMPTON BATHS TENDERS.

Sir,—In reference to the list of tenders in the current issue for baths, &c., for the Corporation at Southampton, we beg to state that no specification or bills of quantities were furnished, but that each contractor was allowed to use his own judgment as to what was the best scheme, consequently there can be no comparison between the tenders. It is certainly remarkable to find an estimate for 1,467*l.* and one for 648*l.* under the same list of tenders. In tenders for the boilers for this work it was quite possible to make a difference of 150*l.* if the boilers were made of iron instead of steel, and in this estimate we included for best steel boilers, as, being for a Corporation job, we took for the best materials and system that we are acquainted with, and evidently some of our competitors have done likewise. It is rather a large order to gauge the Corporation's views of what they are prepared to spend in a case of this kind.

John Smeaton, Son, & Co.

CONCERT HALL, LANGHAM-PLACE.

Sir,—I am very sorry my friend Mr. Phipps has thought it necessary to write to the *Builder* on the subject of his connexion with the above, since he has settled with me, received a sum of money, and relinquished all claim. I cannot, however, allow the matter to be passed by.

The following is the history. Some years back I had designed residential flats to be erected on the site, and, when all was in readiness, the Concert Hall Company offered terms which were agreed to, I going with the land. Mr. Phipps was appointed by the Company, as it was said he could introduce directors and share capital. An appeal was made for funds, but not satisfactorily responded to. It was then determined to proceed privately.

Mr. Phipps prepared the plans and negotiated with the late Metropolitan Board of Works only, nothing more; the skeleton sections were supplied by Messrs. Moreland, with whom Mr. Phipps had made arrangements for the iron and steel work. was asked how many the hall would hold, and finding the number unsatisfactory, on February 2, 1888, I communicated my ideas for a re-cast of plan to Mr. Phipps; on the 4th, asked him to a conference on the subject, and again on May 3, with the result that the sittings were increased by 700. I regret being compelled to write this, but the idea of a dry nurse is not palatable.

For the architecture inside and outside, accoustic arrangements, external loggias, and construction I am alone responsible.

T. E. Knightley.

English Opera House.—The makers of the constructional ironwork in this theatre write to say that their names should have been given as "Reade & Reilly," not "Neade & Riley." The mistake (as they are aware) was not ours.

The Student's Column.

VENTILATION AND WARMING.—VIII.

FORMULÆ FOR MOVING AIR.

We will now investigate the universal formula for movement of fluids in general, which we shall find useful in its application to the movement of air in particular.

We will consider the most general case, namely, a system of piping of varying temperature and section, through which a quantity of water of M cubic feet, at a normal or standard temperature, has to pass. Let the mean temperature of the column of warm water be T°, and that of the column of cool water of same height, t°. For any particular section S of the system we have MA as the quantity, where A denotes the co-efficient of expansion due to the temperature θ of the water at the section S. The velocity is $\frac{MA}{S}$ and the column of velocity or vertical height through which the liquid must fall to produce that velocity is $\frac{M^2 A^2}{2g S^2}$ at a temperature θ. This is equal to $\frac{M^2 A^2}{2g S^2} \cdot \frac{1}{A} = \frac{M^2 A}{2g S^2}$ at the standard temperature, or $\frac{M^2 A}{2g S^2} \cdot A_T$ at the temperature T°.

We have, therefore, generally, for any particular section of the system, the column of velocity for a corresponding temperature T,

(15) $\frac{M^2}{2g} A_T \times \frac{A}{S^2}$

and the loss of power for friction in height of column

(16) $\frac{M^2}{2g} A_T \times \frac{CA}{S^2}$, where C is the co-efficient of loss.

The left-hand factor of these expressions is constant, while the other varies with each particular section. The theoretical necessary pressure is evidently one for which the expression (15) will be a maximum. We may, therefore, write this—

(17)... $\frac{M^2}{2g} A_T \times max. \frac{A}{S^2}$

The column of warm water has a height H, and a mean temperature T. To raise this, there is required not only a column of the same height and temperature, but also a further weight which is sufficient to overcome the resistances of friction. These amount from (16) to

(18)... $\frac{M^2}{2g} A_T \times \Sigma_1 \frac{CA}{S^2}$, where Σ_1 is the sum of the resistances in the various sections of the warm-water column.

This amount (18) is thus sufficient to support the weight of the warm column and to meet its frictional resistance. There may also be a fixed resistance to be overcome, which we may represent by a column of water at the standard temperature and of a height of h_1. This with a mean temperature will be changed to $h_1 A_T$, and we obtain for the sum of resistances

$$\frac{M^2}{2g} A_T \Sigma_1 \frac{CA}{S^2} + h_1 A_T$$

Therefore, altogether we have to overcome

$$H + \frac{M^2}{2g} A_T \Sigma_1 \frac{CA}{S^2} + h_1 A_T$$

Adding to this the column of velocity from (17) we have a requirement of

(19) . . . $H + \frac{M^2}{2g} A_T \Sigma_1 \frac{CA}{S^2} + h_1 A_T + \frac{M^2}{2g} A_T \times max \frac{A}{S^2}$

The cold column of height H and temperature t reduced to standard temperature is HA'_t, and for the mean temperature is raised to $HA'_t A_T$.

For this we must bring into our calculation, as before, a varying and a fixed resistance, and we obtain, therefore, for the resulting pressure :—

$$H A'_t A_T - \frac{M^2}{2g} A_T \Sigma_2 \frac{CA}{S^2} - h_2 A_T$$

Equating this with (19) we have :—

$$HA'_t A_T - H - h_2 A_T - h_1 A_T = \frac{M^2}{2g} A_T \Sigma_2 \frac{CA}{S^2} + \frac{M^2}{2g} A_T \Sigma_1 \frac{CA}{S^2} + \frac{M^2}{2g} A_T \times max. \frac{A}{S^2}$$

$$\text{or } H\left(A'_t - \frac{1}{A_T}\right) A_T - (h_1 + h_2)\, A_T = \frac{M^2}{2g} A_T \left(\Sigma_1 \frac{CA}{S^2} + \Sigma_2 \frac{CA}{S^2} + max. \frac{A}{S^2}\right)$$

If we take h as the sum of h_1 and h_2 and Σ as that of Σ_1 and Σ_2 we obtain

$$H (A'_t - A'_T) - h = \frac{M^2}{2g}\left(\Sigma \frac{CA}{S^2} + max. \frac{A}{S^2}\right)$$

from which results

$$(20)\ M = \sqrt{\frac{2g\,[H (A'_t - A'_T) - h]}{max. \frac{A}{S^2} + \Sigma \frac{CA}{S^2}}}$$

as the universal formula for the movement of fluids, which we shall find to be of considerable utility in regard to the movement of air.

From this general formula we may deduce a simpler expression known as Wölpert's formula.

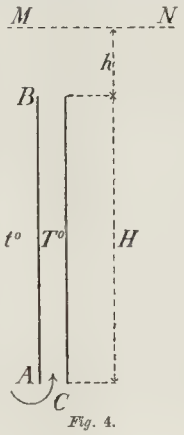


Fig. 4.

In fig. 4 we will suppose AB an open flue. The external atmosphere presses equally in all directions upon it, including, therefore, the direction of the arrow C. The column of warm air, whether produced by a fire at C, or by other means of maintaining a circulation of hot air in the flue, will rise above B, and at last become cooled in the region of MN. We have, therefore, an internal column of warm air of the height H, and above it one of diminishing temperature of the height h, and both together weighing on A ; while the external column of cold air of the height (H + h) acts as a lifting power at the point A. Above MN the general atmospheric pressure acts equally upon both the columns, so that it does not influence the working. The extent of h is very variable, and may become nil if a wind current blows sideways across the mouth of the flue ; therefore, in our calculation, we must reckon the value of h as nil.

The general formula (20) holding good for air, we shall have, taking H_0 and h_0 for a normal temperature at freezing-point,—

$$M_0 = \sqrt{\frac{2g\,[H_0 (A'_t - A'_T) - h_0]}{max. \frac{A}{S^2} + \Sigma C \frac{A}{S^2}}}$$

If we now take for the sake of simplicity, T and t to denote the mean temperature of the warm and cold air columns respectively, the magnitude of A in *max.* $\frac{A}{S^2}$ can only have the value of A_T or A_t. If the column of warm air has a free exit and upward course, the imaginary column of cold air has, so to speak, an endless section, and then $\frac{A_t}{S^2} = 0$. Therefore in this case the *max.* $\frac{A}{S^2}$ can be obtained from the column of warm air. If, on the other hand, the stream of cold air is passing downwards into the warmer by reason of the end B being much cooled, we must similarly obtain the *max.* $\frac{A}{S^2}$ from the cold air column ; therefore this expression becomes *max.* $\frac{A_t}{S^2}$ If we now further denote by S the smallest section, and take no account of any greater than S, then with $h_0 = 0$ as above explained, our formula becomes in the first case, $M_0 = \sqrt{\frac{2g\,H (A'_t - A'_T)}{\frac{A_T}{S^2}(1 + \Sigma C)}}$ and $v = \frac{M_0 A_T}{S}$; and in the second case

$$M_0 = \sqrt{\frac{2g\,H (A'_t - A'_T)}{\frac{A_t}{S^2}(1 + \Sigma C)}} \text{ and } v = \frac{M_0 A_t}{S}$$

Reducing these expressions we have

$$M_0 = S\sqrt{\frac{1}{1 + \Sigma C}}\sqrt{\frac{2g\,H (A'_t - A'_T)}{A_T}}$$

$$\text{and } v = \frac{M_0 A_T}{S}$$

$$M_0 = S\sqrt{\frac{1}{1 + \Sigma C}}\sqrt{\frac{2g\,H (A'_t - A'_T)}{A_t}}$$

$$\text{and } v = \frac{M_0 A_t}{S}$$

If we now substitute the values of M_0 in the equations for v we have

$$v = \sqrt{\frac{1}{1 + \Sigma C}}\ \sqrt{2g\,H (A'_t - A'_T)\, A_T} \text{ and}$$

$$v = \sqrt{\frac{1}{1 + \Sigma C}}\ \sqrt{2g\,H (A'_t - A'_T)\, A_t}$$

If we now substitute the corresponding values in terms of a, the co-efficient of expansion for each degree of temperature, for A'_t, A'_T, A_t and A_T we obtain

$$(21)\ v = \sqrt{\frac{1}{1 + \Sigma C}} \times \sqrt{2g\,H\left(\frac{1}{1 + at} - \frac{1}{1 + aT}\right)(1 + aT)}$$

$$\text{and } v = \sqrt{\frac{1}{1 + \Sigma C}} \times \sqrt{2g\,H\left(\frac{1}{1 + at} - \frac{1}{1 + aT}\right)(1 + at)}$$

Reducing this we get

$$v = \sqrt{\frac{1}{1 + \Sigma C}}\sqrt{2g\,H\frac{a(T - t)}{1 + at}} \text{ and}$$

$$v = \sqrt{\frac{1}{1 + \Sigma C}}\sqrt{2g\,H\frac{a(T - t)}{1 + aT}}$$

Dividing numerator and denominator of the last fraction by a, and remembering that $\frac{1}{a} = \frac{1}{491}$ if we reckon the temperature in degrees Fahrenheit, and $\frac{1}{273}$ if in degrees Centigrade, we have

$$(22)\ \begin{cases} v = \sqrt{\frac{1}{1 + \Sigma C}}\ \sqrt{\frac{2g\,H (T - t)}{491 + t}} \text{ and} \\ v = \sqrt{\frac{1}{1 + \Sigma C}}\ \sqrt{\frac{2g\,H (T - t)}{491 + T}} \end{cases}$$

If for $\sqrt{\frac{1}{1 + \Sigma C}}$ the factor of frictional obstruction, we write C, the value of which in straight flues is usually 0·5 to 0·3, we obtain the expressions $v = C\sqrt{\frac{2g\,H (T - t)}{273 + t}}$ and $v = C\sqrt{\frac{2g\,H (T - t)}{273 + T}}$ In this form the expression for the velocity of moving air is known by the name of Wölpert's formula.

THE NEW YORK WATER SUPPLY.—Ever since the time when the Croton Aqueduct, which supplies New York with water, was first opened, the great dam, known as the Quaker Bridge Dam, and which was to form a complementary work, has engaged the attention of engineers and the New York public generally. That dam, which was to be about four miles below the present Croton Dam, was to give a total storage capacity of 34,000,000,000 gallons. Its height was to be 180 ft. above the bed of the Croton river, below which the foundations would go down 91 ft., and it was not considered perfectly safe on that account. Partly for this reason, and its cost (4,087,000 dols.), it found many opponents. The New York Aqueduct Commissioners have now decided upon the construction of a dam designed to be somewhat less expensive, and at a site presenting fewer engineering difficulties, at Cornell. The site selected for the Cornell Dam is about 1¼ miles above that which had been selected for the Quaker Bridge Dam, and 2⅝ miles below the present Croton Dam. It will give an additional drainage area of 21 square miles, and a storage capacity of 30,000,000 gallons. The new dam will rise 159 ft. above the bed of the Croton river, the foundations going down 70 ft. Its length between flow lines will be 1,736 ft., and its cost is estimated at 3,650,000 dols. Mr. Heley has been instructed to prepare plans without delay, and he estimates that it will take five years to build the new dam.

GENERAL BUILDING NEWS.

Proposed Residence for the Bishop of Wakefield.—The General Works Committee of the Wakefield Corporation have just approved of plans for the proposed residence for the Bishop of Wakefield, which have been prepared by Mr. William White, architect, of London. The building will stand on a plot of land three acres in extent, situate on the north side of Westfield-road. It is to be of red brick with stone dressings, standing back from the road, and having south and east aspects. There are forty-five rooms in all, with their attendant bath-rooms, store-rooms, pantries, and offices. A small conservatory is placed at the south-west corner, and while the main portion of the residence is three stories, that part over the entrance rises to four stories, and forms a tower. The sanitary arrangements and fittings will, it is said, be on the most improved modern principles. Stable buildings will be erected behind the house on the north, while a small entrance lodge will occupy a position at the south-west corner of the site. The contract for the work has been taken by Messrs. Gould & Stevenson, of Leeds, for a trifle under 10,000*l*. Mr. William Watson, of Wakefield, architect and diocesan surveyor, is acting locally.

New Laboratories, Liverpool.—New Analytical Laboratories are being erected in Highfield-street, Liverpool, for Messrs. Knight & Rawson, assayers, from plans prepared by Messrs. Mercer & Allender, Liverpool. Mr. James Crosbie, of 1, Mildred-street, Liverpool, is the contractor.

The Princess's Theatre, Edinburgh, which was closed several years ago, has been acquired by "General" Booth for the Salvation Army. It presents no outward façade, but is situated behind the houses at the junction of Nicolson-street and Hill-place. The principal entrance is by a long and rather narrow passage through the houses from Nicolson-street, and a similar passage leads from Hill-place to the upper gallery. The situation was considered by the magistrates to be a very dangerous one in the event of a fire occurring, and a continuance of the licence was refused several years ago, since which time it has remained empty. There are two galleries, and a very awkward flight of steps leads down to the pit, which is about 8 ft. below the street level. It is proposed to level up the floor, and to do away with one of the galleries. The present entrances will be retained, and the staircase to the gallery rendered fireproof. The site of the stage is to be appropriated by a platform, band-room, officers' room, and retiring-rooms, and the interior will be redecorated. The cost of alterations is estimated at 1,500*l*.

Consecration of St. Peter's Church, Warrington.—The Church of St. Peter, Warrington, was consecrated on the 23rd inst. by the Bishop of Liverpool. The walls externally are faced with grey bricks, with quoins, cornices, and bands of deep red brick. Red terra-cotta is used for the window-sills and other parts. The roofs are slated and the ridges are of red terra-cotta. Close to the south-west porch is the baptistery, containing a sculptured font of red stone. In the arch which marks off the baptistery from the south aisle is ornamental ironwork, and over this, a cross. The chancel and chancel arch, and the windows north of the nave, are seen through the arcade which divides the aisle from the nave. The nave floor slopes up towards the east. The reredos is chiefly of cream-coloured stone. The central part is a vesica-shaped panel of red alabaster, in front of which is a white alabaster cross in relief. There are side panels of variegated alabaster, with the rose and lily inlaid. The reredos is finished above with a moulded and carved cornice. On the south side of the chancel is an arcaded wooden screen, occupying the arch between the chancel and its aisle. There are also sedilia and credence, the latter being in the east wall. The lower part of the walls is of brown glazed brick; above this the windows, doorways, and arches, &c., are of red brick. The circular pillars, two of which carry the large arches between the nave and aisle, are of red brick, and have quatre-foiled capitals of red stone, with symbolical carvings on the cardinal faces. The church has been built by Messrs. Statham, of Pendleton, and the cost, exclusive of the reredos and heating apparatus, has been 3,554*l*. The whole has been designed and superintended by the architect, Mr. Medland Taylor, of Manchester.

Proposed New Board Schools, Cardiff.—Some new schools are shortly to be built on the corner of Court-road and Hereford-street, Cardiff. The style is Gothic, treated very plainly, the outer walls being of coursed Newbridge stone and Bath stone dressings, and the chimney-stacks of red brick. The schools are to be in two blocks,—the boys' and girls' school, a two-storied building, with the boys upstairs, and the infants' school of one story. The scheme embraces a cooking kitchen, laundry, and boys' workshop. The boys' and girls' schools have each accommodation for 350, with teachers' rooms, stores, &c. The infants' school has accommodation for 468, with teachers' room, &c. The total accommodation provides for 1,228 children. The schools have also marching corridors for drill purposes 11 ft. wide. The floor between the boys' and girls' schools is to be of concrete. The architect is Mr. J. P. Jones, of Cardiff.

Leeds and County Liberal Club.—On the 19th inst., members of the Leeds and County Liberal Club entered into occupation of their new club. The building, of which Messrs. Chorley & Connor are the architects, occupies a site in Quebec-street, opposite the site of the new Post-office. Externally, the club is constructed of red terra-cotta, the design being a free rendering of Renaissance. The members' entrance is placed at the end of the front elevation nearest the Midland Station, and has flanking columns and pilasters surmounted by a pediment, with enriched spandrels. Each end of the building has a gable of different design and size. The corner of the club is finished by an octagon turret, with conical roof. We gave a double-page illustration of the building in the *Builder* for May 31, 1890.

Re-opening of Wesleyan Chapel, Ashford.—The re-opening, after internal changes, of the Wesleyan Chapel, in Bank-street, Ashford, took place on the 18th inst. In the rear part of the building a vestry has been placed in each corner, an organ-gallery has been constructed between these, a rostrum and communion space has been placed in front, while over the whole a semi-Gothic arch has been raised. Underneath the chapel considerable excavation has been done, whereby the schoolroom is made two-thirds larger. Mr. H. J. Jeffery was the architect, and Mr. H. Knock the builder.

Proposed New Railway Station, Chappel.—The railway improvements at Chappel, Essex, are progressing rapidly. It is proposed to build a new station, with two platforms and footbridge, a new goods-shed, a signal-box, and four workmen's cottages, the total cost being estimated at about 8,000*l*.

The Derbyshire Infirmary.—At a meeting of the governors of the Derbyshire Infirmary, held on the 23rd inst., it was decided to pull down the present building, the sanitation of which has been proved to be deficient, and to erect new premises at a cost of 74,000*l*.

New Board School, Lower Gornal.—On the 17th inst. the memorial stone of a Board School for boys, which is being erected by Mr. Gough, of Wolverhampton, in the Red Hall-road, Lower Gornal, Staffordshire, from designs prepared by Mr. A. P. Brevitt, architect, Wolverhampton, was laid by Mr. S. Wilkes, Chairman of the School Board. The building is arranged on the class-room system, and will cost about 2,700*l*.

Public Baths, St. Helens, Lancashire.—These baths have been recently completed from the design and specification of Mr. Geo. J. C. Broom, the Borough Engineer. They contain one large plunge for gentlemen, 101 ft. by 30 ft., contained in a building 112 ft. by 47 ft.; one for ladies, 48 ft. by 24 ft., in a building 60 ft. by 40 ft.; and thirty-nine private baths, waiting-rooms, office, caretaker's house, laundry, boiler-house, &c. The floor of the large baths is of cement, and a dado is provided round each, 6 ft. high, of salt-glazed bricks, so that the whole can be thoroughly cleansed with a hose. There is also a small washing bath, 10 ft. square, to the large bath, and this, and the two large baths, are lined with white glazed bricks from the Pant Brick Co., Ruabon, with three rows of blue bricks for diving lines. A shower-bath is provided for each of the private baths. The whole building is heated by steam, also the water in the large baths and hot-water tank for private baths. The cost of the building was 10,249*l*., this amount being equal to 5*l*. 17s. 1d. per square yard of area built upon, or 5·58d. per cubic foot contents. The Town Council voted Mr. Broom a bonus of 100*l*. for the work in December last. The contractors were Mr. John Whittaker, of St. Helen's, for the brick-work and fittings, and Messrs. Thomas Bradford & Co., of Manchester, for the heating and the whole of the laundry fittings. The principal sub-contractors were: for ironwork, Messrs. W. M. Ward & Co., Great Bridge; for woodwork, Messrs. John Rothwell & Sons, St. Helen's; for plumbing, Mr. G. H. Openshaw, Pendleton; for boilers, Messrs. Earnshaw, Heywood; and for white and salt-glazed bricks, the Pant Brick Co., Ruabon. Mr. John Sadler, Widnes, was the Clerk of Works.

Proposed Alterations at the Birmingham Town-hall.—The Estates Committee of the Birmingham City Council have for some time had under consideration a scheme for the alteration and improvement of the Birmingham Town-hall. Messrs. J. A. Cossins & Peacock were called in to assist the committee, and the result of the deliberations was a report which embraces, besides the plan for the alteration of the entrances and the staircases, a scheme for the heating and ventilation of the hall, also for the improvement of the lighting, and lastly for the redecoration of the hall. The committee propose to pull down the existing stone stairs and landings now leading from the front lobby to the floor, the great gallery, and the basement, also to clear away the adjoining wooden pillars and arches, and a piece of the wall between the existing staircases and the hall; to raise the ceiling of the lobby 3 ft.; and to build a flight of seven marble or stone steps 16 ft. 6 in. wide, to ascend from the middle of the south lobby to the floor of the hall, the piers being set back 11 ft. from the inside from the front wall. At the head of this flight of steps it is proposed that there shall be three pairs of folding doors, and beyond them an inner lobby. To obtain the space necessary for this extension and for the staircases to the gallery, it is intended to encroach 7 ft. into the floor of the hall under the great gallery. For improving the means of approach to, and exit from, the great gallery, it is proposed to erect two stone staircases 5 ft. 6 in. wide, from the two rooms between the central lobby and the staircases to the side gallery. On the floor over the side lobbies it is proposed to construct two ante-rooms for ladies and gentlemen, and the floor of the cloak-room and the landing will be of concrete on iron girders. It is proposed to construct two flights of stone stairs from the central lobby to the basement, and to form an assembly-room and separate ladies' and gentlemen's cloak-rooms. It is also proposed to add to the means of egress to the orchestra, and to provide staircases giving firemen safer access to the roof. Improved heating apparatus will be provided, and provision for the installation of the electric light will be made. The cost of the various works will amount to 5,967*l*. In addition, the committee consider that the present affords a convenient opportunity for the cleaning and redecoration of the hall, and they suggest that it might be advisable for the work to be done, as opportunity arose, by capable students of the Municipal School of Art.

SANITARY AND ENGINEERING NEWS.

Barrow-on-Humber.—The Sanitary Committee have just received the report of their Engineer, Mr. Sydney Turner, C.E., for draining the town with sanitary pipes, estimated to cost 1,700*l*.

Sewerage and Water Supply, Swansea.—On the 11th inst., a Local Government Board inquiry was held at the Town-hall, Swansea, by Mr. Thomas Codrington, M.Inst.C.E., respecting the application of the Swansea County Borough Council to borrow 87,836*l*. for works of sewerage and water supply. The proposed sewerage improvements were explained by the officials of the Corporation. Certain objections to the scheme were heard, and at the conclusion of the inquiry Mr. Codrington observed that he would report in due course to the Local Government Board.

STAINED GLASS AND DECORATION.

Whelpley Hill Church School, Berkhamsted.—A series of seven stained glass windows has recently been erected in the chancel here. The central light, containing the figure of our Lord with a chalice, in the act of blessing, being supported in the two lights immediately on either side by the figures of Moses and David, while the four Evangelists in the side windows complete the very effective series. The windows have been designed and executed by Mr. Henry Edgley, of London, who is also responsible for the long brass plate beneath the centre light, with a suitable inscription in memory of the founder of the building.

New Window, Holy Innocents' Church, Fallowfield.—A new stained glass window has just been placed in the apse of Holy Innocents' Church, Fallowfield, by Dr. and Mrs. Ward, of Fallowfield. The window is two light. In the one the subject is "The Annunciation, and in the other "The Nativity," whilst at the foot of the two is the presentation to St. Simeon. In the cinque-foil at the top of the window is a representation of a cherub. The work has been executed by Messrs. Lavers & Westlake, of London.

Decoration of Chancel, St. Peter's Church, Glasgow.—In this church, situate in Braid-street, a scheme of decoration in the chancel has just been completed. The decoration has been carried out under the direction of Messrs. George Walton & Co. The design and execution are the work of Miss Constance Walton, R.S.W., of Glasgow. The first group in the series of designs represents a group of worshippers, mediæval in character—a bishop, a knight, a priest, a king, and a woman. The second group consists of five of the apostles with their appropriate symbols. In the third group opposite are the remaining seven apostles. The fourth group deals with the "Noble Army of Martyrs," all bearing palms and wearing crowns of glory. In the fifth group at each side of the altar stand Cherubim and Seraphim.

New Windows, East Crompton Church, near Oldham.—There has lately been added to this church two new windows from the works of Messrs. Clayton & Bell, of London. One of the new windows illustrates the work of the ministry, having pictures of St. John baptising and St. Paul preaching. The other window is to be called the "children's window." It portrays the blessing of little children and St. Timothy being instructed by his mother.

New Stained Glass Windows, Wordsley Parish Church. — New stained-glass windows have just been erected in the Parish Church of Wordsley by Mr. Samuel Evans, of West Smethwick and Birmingham. The windows consist each of two lights with double tiers.

FOREIGN AND COLONIAL.

FRANCE.—On the cessation of the cold weather, work on the new Hôtel des Téléphones at Paris been commenced. The building is to be in the e Gutenberg, near the Hôtel des Postes. It will be rge mass of brick, iron and glass with no architec- al character to speak of, and is expected to be mpleted in August next.——The Greek sculpture lery at the Louvre has just been re-opened after ing been for a long time closed to the public. contains a great number of precious frag- nts of antique work, notably the fine statue Juno discovered at Samos.——A committee been formed at Arpagon to raise in this little wn a statue to the General Milhaud who dis- guished himself in the wars of the First pire.——M. Auba, the sculptor, has finished his tue of General Raoult who was killed at ischoffen in 1870. It will be erected at Meaux, general's native town.——The Minister of Fine ts has commissioned M. Pierre Ogé to execute, the Palace of the Institut, a bust of M. istel de Coulanges.——The Société des Peintres- aveurs, of which M. Bracquemond is president l open its annual exhibition on April 1 in Durand-Ruel Gallery.——The group of nters known under the name of "Les Amants de Nature" will open their eleventh exhibition to- y (Saturday) at 8, Rue de Furstenberg.——The vn of Narbonne has been the scene of a pro- sional scandal happily rare, the Sous-Préfet the town having dismissed M. Chauvet, the unicipal architect, from his post on account of at are described as "irregularités graves."—— e painter Gérome has had the misfortune to lose son, a talented young artist of the age of five d twenty, who has died at Nice.——M. Henner, mber of the Institut, has been appointed to the sition in the Conseil Superieur d'Enseignement the Ecole des Beaux-Arts, left vacant by the ath of Meissonier.——About 600 pictures of the ench School will probably be sent to the forth- ming exhibition at Moscow.——Last week took ce the funeral of M. Albert Lenoir, architect of e Musée de Cluny, and son of Lenoir the hæologist, who saved from destruction a eat many ancient monuments and collected em in the Musée des Petits Augustins. Lenoir was ninety years of age. His son, M. fred Lenoir, is a sculptor of talent. M. Lenoir at s time filled the place of Sous-Directeur of the ole des Beaux-Arts.——M. Joseph Uchard, of ris, architect of the church of Francis Xavier, is ad.——Other deaths to be recorded are those of Holbeaux, a retired Inspecteur-Général des nts et Chaussées, a few days ago, at the age of venty; of M. Poisson, a decorative painter well- own by his work in various Parisian theatres; d of M. Jongkind, a landscape-painter Dutch by igin but French by adoption, who had studied der Isabey, and was an etcher of considerable wer. He died at Côte Saint André, where he had ed for some years.——It is announced that M. nplessis, the keeper of engravings at the National brary, is a candidate for the late Baron Hauss- ann's position in the Académie des Beaux-Arts, opposition to M. Alphand.——The Commission arged with the enquiry into the Paris maritime nal project, and its effect on the Department of e Seine, has reported unanimously in favour of e project.

BERLIN.—In connexion with the exhibition of the odel of the proposed cathedral, Prof. T. C. Raschdorff s now had twelve sheets of elevations, sections, d plans hung at the "Kunstgewerbe Museum." ey have been drawn to scale of 1·100, treated nochrome, and show some fine draughtsmanship, pecially of the sculptural decoration.——Accord- g to a letter of Mrs. Schliemann, the works of cavation at Hissarlik will not be continued by r until next year, her time being occupied with e editing of Dr. Schliemann's biography, which to be published as soon as possible.——The hliemann Collections at Berlin (presented 1881 d 1884), which are on exhibition at the "Voel- rkunde Museum," and which were visited the Emperor last week, are at present the ject of general interest. The exhibits, ar- nged under personal superintendence of the ceased donor, grouped under seven headings cording to the names given to the seven distinct wns Dr. Schliemann considered he had found ove one another), and labelled according this system with different coloured labels, occupy e numerous cases in two large halls, in the smaller e of which the gold work has been placed in a rge steel safe.——As soon as the winter season of e Imperial court is over, the restoration and ex- nsion of the Royal "Schloss" is to be taken in nd. This huge block which, since 1538, has been ntinually subject to extensions and alterations, eady covers 24,000 square mètres (superficial), hough having numerous flights of roomy recep- on- and ball-rooms, cannot satisfy the require- nts arising from the system of having constant urt pomp with large and small fêtes has been opted by the Emperor.——The preliminary sur- y for the line of the proposed Berlin Sea Canal s been taken in hand, under the direction of th. Scheck, of Frankfort-on-Oder, the route osen at present being the so-called Baltic one viâ erswalde and Stettin.

NEW FINNISH HOUSE OF PARLIAMENT.—The new Finnish House of Parliament at Helsingfors is now fully completed. It stands in close proximity to the Senate House and the Hall of Nobility, and has been designed by Herr Nyström, a prominent architect. The cost is 60,000*l*.—a considerable sum in that country. The building is only intended for the Three Estates, ecclesiastics, burghers, and peasants.

SWEDEN.—At the last meeting of the Building Association of Stockholm an important discussion took place upon the unsound state of the building industry in the capital. The building speculation now going on was greatly censured, and it was urged that qualified architects alone should be permitted to undertake the building of houses. Finally, it was suggested that building speculators should be compelled by law to furnish a guarantee for the payment of all material required before used. ——The Swedish Export Association having appointed an agent for Brazil, similar to others in South America, that official has already sold thirty wooden villas in Rio Janiero, to be shipped in the spring.——One of the oldest and historically interesting churches in Sweden, that of Vadstena, is to be restored at a cost of about 5,500*l*. It was formerly attached to the celebrated cloister of that name.——A fund is now being formed for the building of a Sailors' Home in Stockholm, towards which King Oscar has given 350*l*. ——The Municipality of Stockholm has decided upon purchasing certain lands for the improvement and regulation of thoroughfares, at a cost of 110,000*l*. This year a sum of 12,500*l* is to be expended upon new streets, &c.——The city of Helsingborg is to be lighted by electricity, being the first town in Sweden boasting this improvement. The installation will be effected by Messrs. Siemens & Halske, the well-known Berlin electrical engineers.— The port of Malmö, whence the chief communication between Sweden and the continent is carried on, is to be enlarged, three prizes of 445*l*., 280*l*., and 160*l*. being offered for the best plans.——The Swedish Government has dispatched an electrical engineer to this country and America for the purpose of studying and reporting the latest development of telephonic science.

ANTWERP.—A plan has been prepared for connecting Antwerp with the left bank of the Scheldt by means of two tunnels, Baron Sadoine being at the head of the concern. The cost of such an undertaking would be very great.

SWITZERLAND.—The Bundesrath has decided on having two separate designs made for the proposed new Houses of Parliament, by Professor Auer, of Berne, and Professor Bluntschli, of Zurich, respectively. In the competition, which was opened in 1885, Professor Bluntschli was awarded the first prize and Professor Auer the second, thirty-six designs having been sent in.——The lines of the old Basle Market-place are to be altered, and some new Municipal Buildings to be erected on one side of the place. A competition has been opened for the purpose of obtaining designs.

DRESDEN.—An Exhibition of Water-colours and Drawings, similar to the one held here last year, will be opened in 1892, under the auspices of the Saxon "Kunstgenossenschaft."

VIENNA.—A memorial monument is to be erected on one of the public places to the memory of the deceased Freiherr von Schmidt. A committee of the Austrian "Architekten-and Ing.-Verein" has taken steps to obtain a suitable site from the Municipality, and intends sending out subscription-lists in Germany and Austria.

ROME.—In a lecture on the Turin Architectural Exhibition, given at Hamburg, Baurath Zimmermann, the hon. president of the international jury, informed his audience that an Architectural Exhibition on a grander scale is to be held at Rome in the autumn of 1893.

RUSSIA.—The Anitschkoff Palace in St. Petersburg, where the Imperial family resides, is now lighted throughout by electricity, the installation being said to be the most perfect of any public building in Europe. A memorial to the Empress Catherine II. has just been unveiled at Simferapol, in commemoration of the annexation of the Crimea, which has cost 92,000 roubles. It consists of a pedestal of granite, upon which a huge bronze statue of the Empress is mounted.——A permanent international industrial exhibition will shortly be opened in Moscow. The buildings are situated in the most central part of the town. In connexion with the exhibition is a commercial bureau, which will undertake the sale of exhibits, receiving orders, &c.; in fact, act as a commercial agency for the exhibitors. A newspaper will be issued gratis in connexion with the undertaking.

NORWAY.—A work on "The Norwegian Stave Churches," by Professor L. Dietrichson, is shortly to be published at Christiania. It is a national work upon Norse architecture in the Middle Ages, accompanied by 250 illustrations, chiefly represented by the curious Stave churches, so well known to every tourist, and which seems to be the only style of architecture which Norway can claim as original. The work is the result of many years of labour, and is partly issued by official assistance. ——Work on the Throndhjem Cathedral continues, and by Easter the eastern nave will be ready for service. The work of restoration is now proceeding in the northern and southern sections and the tower. Some twelve years must, however, still elapse before the restoration is completed. The electric light has been introduced into the cathedral. ——An association has been formed in Christiania for the purchase and presentation to the Museum of Arts of ancient Norse silver works, which are now getting very scarce, through the eagerness of foreigners in acquiring such. Some valuable objects have been obtained for the museum.

MISCELLANEOUS.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting of this Association on the 18th inst., Mr. J. W. Grover, F.S.A., in the chair, Mr. Earle Way exhibited an interesting series of Roman articles of pottery found near St. George's Church, Southwark, including an almost perfect patera of fine black ware.—Mr. Macmichael described some curious badges of the earliest insurance offices, in illustration of his recent paper.—Mr. Loftus Brock, F.S.A., exhibited a collection of silver medals commemorating the principal events in the reign of Queen Anne, of great beauty and artistic design.—Mr. Howlett described various discoveries made in and near the old hostelry, the "Maid's Head," at Norwich, some of the articles found being exhibited. One of these was a portion of wall-papering of early date, printed with subjects in the manner of the early block books, and which had been attached to the wall by pins.—Dr. Fryer reported the discovery of some pre-historic flint implements at Mitcheldean, mingled with objects of Romano-British date, the former having been probably brought to the spot by a landslip, the whole being covered with many feet of made ground.—A paper prepared by Mr. H. Syer Cuming, F.S.A.Scot., was then read, in his absence through illness, by Mr. W. de Gray Birch, F.S.A., on "Syllabub and the vessels from which it was partaken."—A second paper by Mr. A. Oliver was "On the Ancient Brass Monuments still remaining in the Churches of the City of London." The principal of these are in the old churches which escaped the great fire of 1666, St. Olave's, Hart-street; St. Andrew's, Undershaft; Allhallows, Barking; and St. Helen's, Bishopsgate. Carefully-executed rubbings of almost the entire series were exhibited and described in detail.

ENGLISH AND GERMAN COALS AT HAMBURG.—For some years past, writes a Hamburg correspondent, a fight has been going on in that city between English and German coal traders. In the last decade the imports have been as follows:—

	German. Tons.	English. Tons.
1880	338,710	1,025,500
1890	815,820	1,581,750

Thus the import of English coals is not quite double that of Germany, whilst ten years ago it was over three times as much. Last year the import of English coals was about the same as in 1889, viz., 1,580,546 tons, whilst from Westphalia 99,000 tons more were imported. It will, therefore, be seen that German coals are competing favourably with English in this important city—the "Liverpool of Germany." Probably a few years hence the import of both will be balanced. During recent years the prices of coal in this town have been abnormally high, and it is feared, from the unsettled state of the labour market in England as well as in Germany, that they will remain so. Naturally, this winter, when for a time all supply was cut off, prices rose enormously, the stocks here not being sufficient to meet a coal famine.

ROOD SCREEN, STAVERTON CHURCH.—The work of re-erecting the fifteenth-century rood screen at Staverton Church, situated on the Dart, between Totnes and Buckfastleigh, has just commenced. The screen was taken down some time ago and conveyed to Mr. Harry Hems's studios at Exeter. There the old oak work was cleaned—a new moulded cell substituted for the rotten and decayed one—and the whole unbroken length of 51 ft. groined from end to end on each side. On the top of the rood loft, and running the length of the screen, is a continuous gallery front facing west, having a height of 15 ft. from the ground, and consisting of a succession of recessed and groined niches. The restoration of this screen has been undertaken at a cost of nearly 1,000*l*. by an anonymous benefactor. Mr. F. B. Bond, of Bristol, is the architect, under whose direction the work is being carried out.

NORWAY.—The Norwegian stone industry in 1890 occupied a considerable force of men, and the quantity of stone exported was a little larger than in the previous year. However, the result has not been very satisfactory, as prices abroad were very low. It is estimated that about 36,000 tons of cut granite were exported, chiefly to London, the chief market for the stone. But the demand has been small, and prices, in consequence, depressed. Paving stone was in good demand, and prices remained fair. The export of the beautiful stone syenite now so much in favour with Norwegian architects did not increase in 1890, as the cost of blasting this material is very great, and the price, in consequence, prevents a very great demand. The stone also called "Labrador," is only found at Laurvig, on the Christiana fjord, but in a great variety of beautiful colours, including black, and is used for columns, plinths, &c.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Drawings for Laying-out and Development of Property	West of England Land and Investment Trst, Limited	35l. and 15l.	Mar. 31
*New Markets and Abattoirs	Borough of Surry	Not stated	May 1
Storage Reservoir	Belper Watrworks Co.	do.	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Alteration and Extension of School	Burton-on-Trent Sch. B	R. Churchill	Mar. 3
*Works and Materials	Lewisham Bd. of Wks.	*Official*	do.
*Public Convenience, Albert-square	Manchester Corp.	do.	do.
Fittings to Library, Newton Heath	do	do.	do.
Boundary Wall	Plymouth, Devonport, & E. Stonehouse S.A.	J. L. Hodge	do.
Public Shelter, Bray, Ireland	.....	P. F. Comber	Mar. 4
Dwelling-house, Collargreen, Craigellachie, N.B.	.....	W Thomson	do.
Yellow Pine (8 000 loads)	G W. R.	*Official*	do.
New Road and Bridge	Tyrone Grand Jury	do.	Mar. 5
Alterations to Workhouse, Whitehead, Maidstone	Hollingbourne Union	do.	do.
Alterations to Workhouse, Greenhouse, &c	do.	do.	do.
Waterworks	Ballyvaughan (co. Clare) Union	.....	do.
Rail and Post Fence (2,000 yards)	Blaydon Local Board	Michael Hawdon	do.
Two Bridges, 50 ft. span, Breakings Stapleton	Longtown Highway Bd.	Richd. Maxwell	Mar. 6
Warehouse, Norton Mills, Eiland	.....	Horsfall & Williams	do.
Three Dwelling houses and Shops, Alma-vale-road, Clifton	.....	Alfred Harford	do.
Casbolder and Tank, Willington Quay	Walker and Wallsend Union Gas Co.	*Official*	do.
*Construction of Sewers	Folkestone Corp.	do.	Mar. 7
Dwelling-house, Allan-grove, Carlisle	.....	Thos. Warwick	do.
Villa Residence, Blights, Whitby	John Linskill	Clark & Moscrop	do.
Granite Road Metal	Brixworth (Northampton) Highway Board	Thos. Gulliver	do.
*Works and Materials	St. Giles Bd of Wks.	Geo. Wallace	Mar. 9
*Iron Fencing	Heaton Local Board	S. S. Grimley	do.
*Erection of House and Laundry	.....	.....	do.
New Institute, Runcorn	Mersey Mission to Seamen	*Official*	do.
*Works and Materials, Chatham	War Department	do.	do.
Repairs of Main Roads	Kent County Council	F. W. Ruck	Mar. 10
Alterations and Additions to Premises, Belfast	Belfast Library and Society for Promoting Knowledge	Young & Mackenzie	do.
Alteration of Buildings at the Workhouse	Newton Abbott Union	S. Segar	do.
*Works and Materials	Rotherhithe Vestry	*Official*	do.
*Main Drainage Extension Works	West Ham Council	Lewis Angell	do
*Boiler House, &c. (Main Drainage Extension)	do.	do.	do.
*Rustic Bridges and Fencing, Lewisham	London County Council	*Official*	do.
*Roadmaking and Paving Works	Hammersmith Vestry	H. Mair	Mar. 11
*Thirty New Almshouses, Chapel, &c.	Trustees of Waddington Hospital Charity	W. Watson	do.
*Construction of Reservoir	Wimbledon Gas and Water Co.	J. Newton & Son	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to deliver
*Road Materials and Team Labour	Norfolk County Coun.	*Official*	Mar.
Sewage Works, Tanks, &c.	Hyde Corporation	Joseph Mitchell	do.
Road Metal (1,240 yards)	Sevenoaks Local Board	Jabez Mann	do.
*Paving Works	Barking Town Loc. Bd.	C. J. Dawson	Mar.
Laying Gas Mains, Plant, &c.	Trim (Meath) T. C.	Hampden Shaw	do.
Flagging, Kerbs, Setts, &c.	Plymouth Corporation	G. D. Bellamy	do.
Additions and Alterations to Police Station, Willenhall	Staffordshire C. C.	W. H. Cheadle	Mar.
*Excavating and Levelling Earthworks	War Department	*Official*	do.
*Infectious Diseases Hospital	Borough of Blackburn	do.	Mar.
Whinstone Road Metal (1,500 tons)	Whitley and Monkseaton Local Board	do.	do.
*New Boilers to Hospital Ships	Mch. Asylums Board	C. Thomson	do.
Iron, Water Tank, Water Mains, Building Works, &c.	Rothwell Local Board	Mr. Starkie	do.
Re-building Three Bridges	Durham County Coun.	Wm. Crozier	do.
*Works and Materials	Colchester Twn Coun.	H. Goodyear	do.
*Erection of Baths and Washhouses	Islington Vestry	A. H. Tiltman	Mar.
*Works and Materials (Newcastle Sub District)	War Department	*Official*	do.
*Works and Materials (Woolwich District)	do.	do.	do.
*Works and Materials (Gravesend Sub-District)	do.	do.	do.
*Sewers Works, Morden	Battersea Burial Bd.	do.	do.
Re-building Three Bridges	East Sussex C. C.	Henry Card	Mar.
*Works and Materials	Tottenham Local Bd.	*Official*	do.
*Residence for Medical Superintendent	Wilts County Asylum	C. S. Adye	Mar.
*Works, Repairs, Building Materials, &c.	War Department	*Official*	do.
Aldershot	Parish of St. Mary Abbotts, Kensington	do.	Mar.
*Making-up, Painting, and Enclosing Recreation Ground, &c.	War Department	do.	do.
*Works and Materials (Sheerness Sub-District)	Sandgate Local Board	W. L. Barrett	Mar.
*Sea Wall and Esplanade	.....	Geo. Watson & Son	No d
Drill and Concert Hall, Portland-place, Penrith	.....	Petty & Ives	do.
Fireproof Warehouse, Halifax	.....	do.	do.
Reservoir, Halifax	.....	J. F. Walsh	do.
Six Houses, Lightcliffe, Halifax	.....	Chas. Walker	do.
Board Schools, Caretaker's House, &c. Blyth, Northumberland	.....	*Official*	do.
Work at Fever Hospital	Leeds Corporation	C. H. Thornton	do.
Detached House and Stabling, Armley, Leeds	.....	W. A. Mann	H. H. Dyer & Son	do.
House and Premises, Cogenhoe, Northampton	.....	do.	do.
Pitch Pine Flooring Boards (100 squares), Bridgend	Glamorgan Coun. Asy.	*Official*	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
Assistant Surveyor	Aston Manor Loc. Bd.	3l. per week	Mar.
*Superintendent of Night Scavenging	Stockton-on-Tees Corp.	Not stated	Mar.
Waterworks Overseer	Pembroke (Ireland) Town Comms.	2l. 2s. per week	Mar.
District Surveyor	East Sussex C. C.	180l.	Mar.
*Inspector of Nuisances and Others	Sanitary Institute	Not stated	Mar.
*Clerk of Works	Wilts County Council	do.	No d

Those marked with an Asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv., vi., and viii. Public Appointments, p. xxi.

THE ENGLISH IRON TRADE.—The English iron market remains quiet on the whole, but there is a faint glimmer of hope with regard to the future. At present the tendency of prices is still downwards, if we except the pig-iron markets of the north and north-west. The Glasgow warrant market has been lifeless again, but it may at any moment be stirred into activity, should an upward movement be attempted by speculators, of which there are signs. Pig-iron continues dull and rather weak in the southern markets. Business in manufactured iron and steel is quieter if anything, makers complaining of its unprofitable nature. Shipbuilders are well engaged, but are booking but few fresh orders. Engineers are receiving fewer inquiries.—*Iron.*

ELECTRICITY BY WATER-POWER IN SWITZERLAND.—In Switzerland we hear that attempts are being made to utilise the numerous waterfalls in the country for working dynamos. For instance, at Lausanne, a company has just been formed for utilising a fall of 3,000 horse-power. The installations are nearly completed, and five factories are to be worked by electricity from the same.

MR. J. T. CHAPPELL'S STAFF DINNER.—The annual dinner and smoking concert of the staff of Mr. John T. Chappell, the well-known builder and contractor, of London and Brighton, took place last Saturday evening in the Venetian Chamber of the Holborn Restaurant. In the unavoidable absence of Mr. Chappell the chair was worthily filled by Mr. G. H. Chappell, who, being about to enter the bonds of wedlock, was during the evening made the recipient of a very handsome wedding present subscribed for by members of the staff. A very large party was present.

MONUMENT TO THE EMPEROR ALEXANDER II.—In the Imperial Square of the Kremlin, Moscow, a magnificent monument is now being erected in memory of Alexander II. abolishing serfdom. The Imperial statue, which will at night be illuminated by a number of electric glow-lamps, stands in a pillared hall open on three sides, whence marble steps flanked by walls lead down to the river. The foundation-stone of the hall is to be laid in May next, most probably simultaneously with the opening of the French Exhibition in Moscow. It is anticipated that the Czar will perform the ceremony.

A WATER-TANK NUISANCE.—It seems almost incredible, but it is nevertheless a fact, that there exists at the present time an old iron tank in New York, which has contained water (unused) for nearly 100 years. The history of that tank is interesting. The tank, which nearly fills the whole building of No. 25, Centre-street, was constructed by the Manhattan Company, under a charter obtained in 1798. At that time, a certain Aaron Burr and his political associates wished to establish a bank in opposition to the banks under the control of a certain Alexander Hamilton and his friends. Burr resorted to a trick, and caused the passage of an Act to charter a company with a capital of 2,000,000 dols., to supply water to New York, and with powers to engage in the East India trade, and to establish a bank. The Bank of the Manhattan Company became a permanent and useful institution, but the business of supplying water to the city went no further than the erection of the tank, which has been kept full of water ever since, in order to comply with the terms of the bank's charter. The tank has at last become a nuisance. It has been reported to the New York Board of Health that malaria has broken out in the neighbourhood, and the board has ordered an investigation in consequence of the complaint.

THE AMERICAN PRODUCTION OF STEEL.—The statistics prepared from the returns received by the American Iron and Steel Association from the manufacturers show that the output of Bessemer steel ingots in the United States in 1890 amounted to 3,651,728 gross tons (of 2,240 lbs.), which is 751,524 tons, or 25 per cent., more than in 1889, when the production was 2,930,204 tons. The American production of Bessemer steel rails last year was 1,797,489 tons, against 1,470,267 tons in the preceding year. The increase in production for 1890 was 327,222 tons, or 22 per cent., compared with 1889. The above figures show that, while the output of Bessemer steel ingots in the United States in 1890 was the largest in the history of the American iron industry, the production of Bessemer steel rails has only once been exceeded, and that was in 1887, the year of the railway boom, when the mileage of new track laid down exceeded 12,000 miles. The output of steel rails in that year was 2,101,904 gross tons.

THE BOMBAY GRAVING-DOCK.—That most valuable acquisition, a first-class graving-dock in India, is about to become an accomplished fact. According to the *Times of India*, the new Bombay dock will be ready for use in a week or two. The following are the particulars:—Length of floor, 500 ft.; extreme length available for docking purposes, 530 ft.; width at coping, 90 ft.; width at floor, 62 ft.; depth of dock at head, 33 ft.; available depth for docking at high-water, ordinary spring tide, 27 ft. 3 in.; width of entrance, 65 ft. 6 in. The work is described as very substantial, no less than 140,000 cubic feet of dressed stone and 32,000 cubic yards of rubble masonry having been utilised in the construction. The whole of the masonry is of rubble faced with ashlar, the stone used being the ordinary basalt found in the Island of Bombay while the facing is of a similar description to that used in the retaining-wall of Victoria Docks. The stone used for forming the grooves by which the caisson is to be retained is Cornish granite, which has been taken from England for the purpose. The work comprised 95,000 cubic yards of excavation, as was all done by hand. The dock has been specially laid out with a view to accommodate such vessels as H.M.S. *Warspite* and *Imperieuse*. It will hold 7,000,000 gallons of water, and will be filled through culverts placed on either side of the entrance. There are three 36 in. centrifugal pumps, which will, if required, pump the dock out in three hours.

MEETINGS.

SATURDAY, FEBRUARY 28.

Architectural Association. — Visit to St. Philip's Church, Stepney.

Builders' Foremen and Clerks of Works' Institution.—Annual dinner, Holborn Restaurant. 6 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." 3 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." IV. 4.15 p.m.

MONDAY, MARCH 2.

Royal Institute of British Architects.—Special General Meeting to elect the Royal Gold Medallist for the current year. Followed by the ninth General Meeting. Paper by Mr. Somers Clarke, F.S.A., on "The Fall of One of the Central Pillars at Seville Cathedral." 8 p.m.

Surveyors' Institution.—Adjourned discussion on Mr. A. A. Hudson's paper on "Recent Legislation as to Buildings and Streets in London." 8 p.m.

Society of Engineers.—Mr. Arthur Rigg, on "The Balancing of High-speed Steam-engines. 7.30 p.m.

Society of Arts (Cantor Lectures).—Mr. Gisbert Kapton on "The Electric Transmission of Power." III. 8 p.m.

Clerks of Works Association (Carpenters' Hall).—Paper by Mr. W. Baker. 8 p.m.

Royal Institution. — General Monthly Meeting. 5 p.m.

Liverpool Architectural Society.—Mr. J. A. Berrington on "Foundations." 7 p.m.

Institution of Civil Engineers.—Students' Visit to the Locomotive and Carriage Works of the Great Eastern Railway, at Stratford. 2 p.m.

TUESDAY, MARCH 3.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. J. Sykes on "General Powers and Duties of Inspectors of Nuisances." 8 p.m.

Institution of Civil Engineers. — Mr. J. Thornhill Harrison on "The Subterranean Water in the Chalk Formation of the Upper Thames, and its Relation to the Supply of London." 8 p.m.

Society of Biblical Archæology.—8 p.m.

Manchester Architectural Association.—Mr. Banister Fletcher, Jun., on "The Late Paris Exhibition." 7.30 p.m.

Glasgow Architectural Association.—Business Meeting. 8 p.m.

WEDNESDAY, MARCH 4.

Carpenters' Hall (Free Lectures to Artisans).—Professor J. M. Thomson on "Chemistry of Building Materials." 8 p.m.

Civil and Mechanical Engineers' Society.—Mr. J. H. Paul, B.Sc., on "The Prevention of Scale in Boilers." 7 p.m.

British Archæological Association.—1. The Rev. H. Barber on "The Parish of Ramsbury, Wilts." 2. Mr. J. H. Macmichael on "Tradesmen's Signs of Old London: Eastern portion." 8 p.m.

Society of Arts.—Mr. J. Harrison Carter on "Modern Flour Milling." 8 p.m.

THURSDAY, MARCH 5.

Royal Institution.—Professor C. Meymott Tidy on "Modern Chemistry in Relation to Sanitation." I. 3 p.m.

Society of Antiquaries.—8.30 p.m.

Royal Archæological Institute.—1. Paper by Mr. E. Peacock, F.S.A. 2. The Rev. J. Hirst on "Some Tombs in Crete of the Age of Mycenæ." 3. Mr. H. S. Cowper on "Objects Found in the Thames." 4 p.m.

FRIDAY, MARCH 6.

Architectural Association.—Paper by Mr. Basil Champneys. 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. J. Sykes on "Objects and Methods of Inspection." 8 p.m.

Royal Institution.—Professor J. A. Fleming, M.A., on "Electromagnetic Repulsion." 9 p.m.

Society of Arts (Popular Afternoon Lectures).—Captain Abney, F.R.S., on "The Science of Colour." 4.30 p.m.

SATURDAY, MARCH 7.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." IV. 3 p.m.

Edinburgh Architectural Association.—Visit to Saughton Mill and Saughton House.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

1,897.—OUTSIDE SEAT: *A. Greenaway.*—This invention relates to a sliding-seat for use in cleaning windows or for outside work. It is made in deal, with grooves for bearers to run in, and so constructed as to form a stop on outside of stone sill. When fixed, it stands level with top-bead on the sash-sill, and is secured internally by lever-latch or similar contrivance.

1,795.—IMPROVEMENTS IN WATER CLOSETS: *W. Roff.*—This claims to be an improved elastic valve closet, the earthenware parts being formed in one piece, and the flushing valve, as also the valve at the bottom of the basin, being worked in an improved manner.

2,057.—DOOR CHECKS: *R. Morris.*—In the construction of this check, the cylinder is attached to a rod extending forwards along the door, and jointed thereto at a distance from the hanging stile, and the piston is attached by a crosshead to two side rods extending backwards, and jointed to a bracket projecting from the hanging style.

3,784.—IMPROVED CLOSETS FOR RAILWAY CARRIAGES: *Elphick.*—The seat is provided with a counterbalance weight, tending to gradually raise it when not held down. The seat carries an arm having a roller at its end, which, as the seat moves either way, passes across a valve, opening it, and admitting water to the basin. The seat has also pivoted to it one end of a connecting rod, which actuates one end of a bell-crank lever, the other end carrying the valve for closing the outlet to the pan.

5,310.—SLATE-ROOFING: *H. P. Sharp.*—One thickness only of slate is used. The rafters are rebated both sides as if for glazing with putty, leaving a raised fillet in centre of rafter. Milled lead strips of H section, the lower half fitting on the raised fillet or rafter, is secured with copper tacks. The slates are bedded in putty, and the flanges finished off with a tool made for the purpose.

6,895.—RAISING LADDERS, &C.: *C. Parker.*—This refers to a kind of portable winch, made to fix or clamp over rails, &c., to raise ladders, pianos, furniture, &c, in an easy manner.

17,795.—BUILDING MATERIAL: *F. Oschwald.*—The material is called "peat stone," and consists of disintegrated or comminuted peat and plaster of Paris, made into blocks which have considerable resisting power against compression, and are light, and also bad conductors of heat and sound, thus being useful in many situations where warmth and quietness are desired.

9,645.—SASH BALANCES: *R. M. Gardner.*—This specification refers to a device for fastening in the sash metal or ribbon tape, which is thought to be better than cords or chains for hanging the sashes. The end of the ribbon is drawn through an orifice, turned back, and fastened by a wooden wedge.

NEW APPLICATIONS FOR PATENTS.

February 9.—2,313 J. Golding, Self-adjusting Sills for excluding Draughts from the bottom of Doors.—2,314, Schubert and R Werth, Pneumatic Door-stop.—2,324, Hadfield, Window-sash Fastenings.—2,325, T. Smith & T. Sheldrake, Fastenings for Windows, Doors, &c. —2,382, H. Wilcox and others, Manufacture of White Lead, &c.

February 10.—2,382, G. Scollay, Paint or Paint Block.—2,389, J. Perry Socket bolt for Securing Window, Doors, &c.—2,435, W. Warne, Window Sash-fastener.—2,457, J. Hopper, Roofing Materials.

February 11.—2,494, E. Duncan, Door-stops.

February 12.—2,528, J. Holdsworth, Warming Air for Drying-rooms, &c.—2,534, W. Parsey, Scaffolding.—2,536, Hodge and J. Murdoch, Chimney-tops or Cans.—2,549, Jones, Glazed Roofs, &c.—2,554, W. Ingram, Spirit-levels.—2,559, J. Mewburn, Preventing the Slamming and Swinging of Doors.—2,563, G. Goldsmith, Chimney-pots.

February 13.—2,591, J. Steen, Metal Screws for Wood-work, &c.—2,614, A. Howell, Window-sash Fasteners.—2,619, G. Downie, Smoke-consuming Apparatus.—2,638, Skelton, Grates or Fireplaces.—2,645, W. de Morgan, Fire-grates or Fireplaces.—2,647, A. Lawrence, Moulding Artificial Stone-paving Slabs.—2,655, W. Beebham and Thomas, Chimney-cowl.—2,669, G. Redfern, Storm Doors.

February 14.—2,694, D. White, Filler for French Polishing.—2,700, W. Scott-Moncrieff, Waste preventing Cisterns.—2,704, A. Lowy, Painting Stone, Wood, Metal, &c. —2,726, R. Duncan, Preventing the Slamming of Doors and the Rattling of Windows, Shutters, &c.—2,740, F. Prescetto, Flushing Apparatus.

PROVISIONAL SPECIFICATIONS ACCEPTED.

20,156, G. Parsons, Sash Fastener.—20,720, C. Darrah, Ventilating and Illuminating Shop-windows and Fronts. 537.—E. Brown, Door-handle Fastening.—665, W. Deeming, Sanitary Pipes, &c.—1,064, H. Lewis, Joiners' Bench Cramps.—1,247, J. Shanks, Lavatory or Washhand Basins.—1,601, T. Whittaker, Machines for Making and Pressing Bricks, &c.—1,750, C. Von Forell, Artificial Roman Cement.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

3,882, T. Birtwistle and S. Bardsley, Safety Hinge for Folding Ladders, &c.—7,313, J. Bayly, Drainage and Water Supply System.—13,134, C. Abel, Bricks, &c.—19,329, E. Edwards, Process for Making Imitation Walnut-wood.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

FEBRUARY 12.—*By Wilkinson, Son, & Welch* (at Brighton): No. 31, Bedford-sq., Brighton, f., r. 140*l.*, 2,300*l.*; No. 25, Regency-sq., f., r. 104*l.*, 1,700*l.*; 23, York-rd., Hove, f., r. 55*l.*, 870*l.*

FEBRUARY 16.—*By A. Richards:* Profit rental of 78*l.*, u.t. 11 yrs., g.r. 10*l.*, St. Paul's-rd., Highbury, 630*l.*—*By Elliott, Son, & Boyton:* 417 and 419, King's-rd., Chelsea, f., r. 90*l.*, 1,800*l.*

FEBRUARY 17.—*By H. Tilley:* "The Hope" public-house, St. John's-st., Smithfield, f., r. 120*l.*, 5,600*l.*—*By E. Holsworth:* 87, Darenth-rd., Stamford-hill, u.t. 92 yrs., g.r. 10*l.*, r. 55*l.*, 635*l.*—*By C. W. Davies:* 2, Mount Pleasant, Crouch-hill, u.t. 56 yrs., g.r. 3*l.* 10s., 350*l.*—*By Chinnock, Galsworthy, & Co.:* Nos. 423 and 424, and 1 and 2, Bedford-st., Strand, area 2,800 ft., 20,900*l.*—*By Fitch & Roper:* 43, Silverthorne-rd., Battersea, u.t. 85 yrs., g.r. 5*l.* 6s. 8d., 215*l.*—*By E. C. Newsom:* 1 to 6, Connaught-rd., Ealing, u.t. 93 yrs., g.r. 4*l.*, 730*l.*; 7 to 17 (odd), Connaught-rd., u.t. 93 yrs., g.r. 4*l.*, 665*l.*; 1 to 7, Argyle-ter., Teddington, u.t. 91 yrs., g.r. 4*l.* 10s., r. 109*l.*, 365*l.*; the residence, "Bankside," Enfield-rd., Winchmore Hill, u.t. 88 yrs., g.r. 9*l.*, r. 45*l.*, 440*l.*—*By Reynolds & Esson:* 39, Gibson-sq., Islington, u.t. 36 yrs., g.r. 9*l.*, 395*l.*; 4, Southcote-rd., Camden Town, u.t. 75 yrs., g.r. 7*l.* 7s., r. 42*l.*, 450*l.*

FEBRUARY 18.—*By Norton, Trist, & Gilbert:* An improved rental of 401*l.*, Savoy-st., Strand, u.t. 30 yrs., 7,200*l.*; an improved rental of 274*l.*, u.t. 30 yrs., Lancaster-pl.; an improved rental of 239*l.*, u.t. 30 yrs., with reversion for 28 yrs.; improved rental of 86*l.*, same term, with reversion for 6 yrs.; improved rental of 259*l.*, same term, with reversion for 15 yrs., 12,900*l.*—*By Douglas Young:* 14 to 20 (even), Speenham-rd., Brixton, u.t 90 yrs., g.r. 31*l.*, r. 160*l.*, 1,400*l.*—*By Towers, Ellis, & Co.:* 6, Connaught-st., Hyde-pk., u.t. 23 yrs., g.r. 18*l.* 18s., r. 120*l.*, 1,220*l.*; 13, Howley-pl., Maida-hill, u.t. 46 yrs., g.r. 15*l.*, 375*l.*—*By A. J. Collier:* 45, High-st., Poplar, f., r. 36*l.*, 450*l.*; No. 134, Hackney-rd., f., r. 4*l.*, 67*l.*—*By Edwin Smith & Co.:* 8, Hanover-st., Hanover-sq., f., r. 650*l.*, 12,000*l.*; 98, Eaton-pl., Belgravia, u.t. 33 yrs., no g.r., r. 400*l.*, 5,000*l.*; 1 g.r. of 100*l.*, Portland-pl., u.t. 20 yrs., g.r. 10*l.*, 1,120*l.* By *Fuller, Horsey, Sons, & Cassell:* F. plot of garden ground, la. 0r. 35p., Barrington, Cambs, 120*l.*; nine acres of f. allotment land, 145*l.*; a plot of f. allotment land, 60*l.*

FEBRUARY 20.—*By Ball, Norris, & Hadley:* 97, Endlesham-rd., Balham, u.t. 82 yrs., g.r. 7*l.*, r. 28*l.*, 245*l.* By *A. Booth:* 81, Brecknock-rd., Camden-rd., u.t. 49 yrs., g.r. 8*l.*, 340*l.* *By C. & H. White:* 2 and 4, Wynne-rd., Brixton, f., r. 173*l.* p.a., 1,625*l.*; 48, Chrysselt-rd., u.t. 9 yrs., g.r. 5*l.*, r. 30 p.a., 100*l.*; 72 and 74, Ingleton-st., u.t. 12 yrs., g.r. 5*l.* 6s. 9d., r. 41*l.* 12s., 120*l.*; No. 162, Wandsworth-rd., u.t. 7 yrs., g.r. 7*l.*, 45*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; str. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.			
	ton	6 10 0	7 15 0
Teak, E.I.	load	8 10 0	14 0 0
Sequoia, U.S.	ft cub.	2 0	3 0
Ash, Canada	load	2 10 0	4 5 0
Birch, do.	,,	2 5 0	4 5 0
Elm, do.	,,	3 1 0	4 17 6
Fir, Dantzic, &c.	,,	2 0 0	2 15 0
Oak, do.	,,	2 10 0	4 4 0
Canada	,,	4 17 6	5 10 0
Pine, Canada red	,,	2 10 0	3 10 0
Do., yellow	,,	2 0 0	5 10 0
Lath, Dantzic fath.		5 0	6 0 0
St. Petersburg		5 0 0	7 0 0
Deals, Finland,			
2nd & 1st sel.	100	7 0 0	10 0 0
Do. 4th & 3rd	,,	7 0	8 0 0
Do. Riga	,,	6 0 0	7 10 0
St. Petersburg,			
1st yel.	,,	9 0 0	14 0 0
Do. 2nd yellow	,,	8 0 0	9 0 0
Do. white	,,	6 10 0	10 0 0
Swedish	,,	6 10 0	12 0 0
White sea	,,	8 0 0	16 10 0
Canada, Pine 1st	,,	14 0 0	24 0 0
Do. do. 2nd	,,	9 0 0	15 10 0
Do. do. 3rd, &c.	,,	6 10 0	10 0 0
Do. Spruce, 1st	,,	8 10 0	14 10 0
Do. do. 2nd	,,		
	2nd	6 0 0	7 10 0
New Brunswick	,,	6 0 0	7 0 0
Battens, all kinds	,,	4 10 0	15 10 0
Flooring Boards,			
sq. 1 in. prep.			
1st	,,	0 19 0	0 14 0
Do. 2nd	,,	0 9 0	0 10 6
Other qualities	,,	0 5 0	0 7 6
Cedar, Cuba	ft.	0½	½
Honduras	,,	¾	¾
Mahogany, Cuba	,,	½	¾
St. Do.			
	cargo av.	½	⅝
Mexican do. do.		½	⅝
Tobasco do. do.		⅝	⅝
Honduras do.		⅝	⅝
Box, Turkey	ton	4 0 0	15 0 0
Rose, Rio	,,	12 0 0	19 0 0
Bahia	,,	10 0 0	18 10 0

TIMBER (*continued*).

Satin, St. Do.		
logs	ft	0 0 9 0 1 3
Port Rico	,,	0 0 10 0 1 6
Walnut, Italian	,,	0 0 4 0 0 7

METALS.

Iron Bar, Welsh,		
in London	ton	6 5 0 6 7 5 0
Do. do. at Works		
in Wales	,,	5 15 0 6 5 0
Do. Staffordshire,		
in London	,,	6 5 0 7 0 0
Copper—British,		
cake and ingot	,,	56 0 0 57 0 0
Best selected	,,	58 0 0 60 0 0
Sheets, strong	,,	68 0 0 70 0 0
Chili, bars	,,	52 10 0 53 0 0
Yellow Metal	,,	0 0 6 0 0 6½
Lead—Pig	,,	20 0 0 20 5 0
Spanish	,,	12 12 6 13 0 0
English, Cal.		
brands	,,	12 15 0 0 0 0
Sheet, English,		
3 lbs. per sq. ft.		
and upwards	,,	14 10 0 15 0 0
Pipe	,,	15 0 0 0 0 0
Zinc—English		
sheet	ton	27 10 0 0 0 0
Vieille Mon-		
tagne	,,	28 5 0 0 0 0
Tin—Straits	,,	90 0 0 0 0 0
Australian	,,	89 5 0 0 0 0
English Ingots	,,	94 10 0 0 0 0

OILS

Linseed	ton	22 10 0 22 15 0
Cocoanut, Cochin	,,	36 0 0 0 0 0
Do. Ceylon	,,	29 0 0 0 0 0
Palm, Lagos	,,	25 10 0 0 0 0
Rapeseed, English		
pale	,,	28 15 0 29 0 0
Do. brown	,,	27 5 0 27 10 0
Refined red	,,	29 0 0 0 0 0
Ozene	,,	21 10 0 24 0 0
Lubricating, U.S.	,,	6 0 0 7 0 0
Do. refined	,,	7 5 0 12 0 0
Palm, Stockholm		
	barrel	1 1 6 1 2 0
Archangel	,,	0 14 6 0 0 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BUILTH WELLS.—For the erection of two houses, Castle-street, Builth Wells, Radnor, for Mr. Evan Evans. Mr. Telfer Smith, Architect, 5, Market Hall-buildings, Builth Wells:—

Henry Price	£795	0	0
John D. Williams	774	10	0
Alfred Meredith	639	0	0
Henry Owen	£636	0	0
Thomas Jones, Builth*	600	0	0

* Accepted.

CRICKHOWELL.—For the erection of a public-hall and caretaker's cottage, for the Public-hall Company, Limited. Mr. E. A. Johnson, architect, Abergavenny. Quantities by the architect:—

T. Watkins & Jenkins	£2,300	D. C. Jones & Co.	£1,984
T. S. Foster	2,280	J. D. Williams, Knighton*	1,836
J. G. Thomas	2,195	T. Jones & Son	1,810
H. Smith	1,984		

* Accepted (amended tender).

DROXFORD (Hants).—For making alterations, constructing additional quarters and fire escape exits at the Workhouse, for the Guardians. Mr. A. E. J. Guy, architect, 79, Albert-road, Southsea:—

W. Learmouth	£190	12	2
H. Meredith	180	16	6
Read	180	15	0
T. P. Hall	£178	6	4
Thomas Westbrook, Droxford (accepted)	163	5	6

DUNDALK.—For the construction of main drainage sewers, manholes, &c., for the Town Commissioners. Mr. J. Gaskin, Town Surveyor, Townhall, Dundalk.

James Wynne	£4,852	2	6
Cullen Brothers	4,739	0	0
J. McAdam	4,512	7	6
A. Whelan	£4,504	12	0
Hegarty & Gault, Ballymena*	4,128	6	7

* Accepted. [Surveyor's estimate, £4,181.]

EALING.—For alterations to "Little Haven," for Major-General Collinson. Mr. Chas. Granville Baker, architect, 5, Bloomsbury-square:—

Myring	£275 0 0

FINCHLEY.—For building stables, coachhouse, &c., at Church End, Finchley. Mr. F. D. Thomson, architect and surveyor, Woodside Park, Finchley, N.:—

Smith & Son	£587	Voller	£449
Brown & Sweetland	486	Wheeler & Co.	420

FINCHLEY.—For alterations to premises, High-street, North Finchley. Mr F. D. Thomson, architect and surveyor, Woodside Park, Finchley, N.:—

Smith & Son	£398	Voller	£339
Brown & Sweetland	349	Wheeler & Co.	352

FRIMLEY.—For the erection of cottage, stabling, &c., for Mrs. Lyne. Mr. H. Blackburn, architect:—

Killby & Gayford	£4,988	Crask	£4,457
Gale	4,754	Watson	4,192
James	4,661	Finch	4,128
Sabey & Son	4,753	B. E. Nightingale	4,070
Charteris	4,540	Kemp	3,937
Harris & Son	4,515	Spice & King	3,898
Martin & Wells	4,405		

GUISELEY (Yorks).—For the erection of Wesleyan chapel and school, with Park View Mr. Herbert Isitt, architect, 41, Sunbridge-road, Bradford, Yorks:—

Masons—J. Fisher, Guiseley	£532	0	0
Joiner—J. Dean, Shipley	538	15	0
Plumber—G. & R. Mann, Rawdon	139	0	0
Plasterer—A. Firth, Yeadon	60	0	0
Slater—W. Walker, Westgate, Otley	157	8	0
Painter—E. W. Walker, Ilkley	29	0	0

HINCKLEY.—For the construction of about 530 yards of 12-inch, and about 150 yards of 9-inch pipe drainage, &c., at Barwell, for the Hinckley Union Rural Sanitary Authority. Mr. W. D. Bennett surveyor:—

Henry Hewitt	£223	0	0
C. Dalferis	185	15	10
Atkinson	£180	0	0
J. Lockey, Barwell*	170	0	0

* Accepted.

LEICESTER.—For alterations and additions to the Major-street Board-school, for the Leicester School Board. Mr. Edmund Burgess, architect, 6, South-square, Gray's-inn, London, W.C.

Adamson & Son	£4,980	J. Barry, Rugby	£4,679
Bell & Son	4,968	J. Hutchinson & Sons	4,644
T. Richardson & Son	4,794	J. C. Kellett & Son	4,529
Thos. Warren	4,780	Thos. & Hy. Herbert, Clark & Garrett	4,485
	3,796	Leicester (accepted)	3,485

LONDON.—For the erection and completion of New French Protestant Church, Soho-square, W. Mr. Aston Webb, architect:—

Perry	£11,670	B. E. Nightingale	£10,795
Hall, Beddall, & Co.	11,240	Dove Bros.	10,745
Ryder & Son	11,070	J. Beatley	10,286
Smith & Son	10,935	Higgs & Hill	10,194

LONDON.—For the erection of a new Public Bath at Rotherhithe-road, for the Rotherhithe Vestry. Mr. W. H. Thirtle, Public Baths Architect (Queen Victoria-st.):—

Patman & Fotheringham	£5,812	Scrivener	£5,563
Cole & Son	5,770	Lathey Bros.	5,500
Perry & Co.	5,727	J. Smith & Son	5,347
T. Cubitt & Co.	5,720	Higgs & Hill	5,344
Grover & Son	5,715	Nightingale	5,141
Hurt Bros.	5,691	Ansell	5,141
J. Thomas	5,580	Garlick & Horton	5,120

LONDON.—For the extension and completion of the Church of the Sacred Heart, Camberwell New-road, S.E. Mr. Fred. A. Walters, F.S.A., architect:—

Hill, Brothers	£4,135	Longley & Co.	£2,745
Jones & Son	3,995	Gregory & Co.	2,547
Smith & Son	3,561	B. E. Nightingale	2,408
Ryder & Son	3,276		

LONDON.—For the erection of new buildings, Housecroft-road, N.W., for Messrs. J. Brasswell & Sons. Mr. C. W. Stephenson, architect:—

Bishop	£4,842	Gerrard	£4,767
Ryder & Son	4,808	Patman & Fotheringham	4,691
L. E. Nightingale	4,807	Downs	4,688

LONDON.—For the erection of a granary at Battersea, for Mr. A. F. Hall. Mr. Robert Burr, architect, 25, Fulham Park-gardens, S.W. Quantities supplied:—

Jarvis & Son	£4,695	W. Johnson	£4,340
Holloway Bros.	4,662	Godfrey & Son	4,268
Thos. Triggs	4,620	W. Hammond	4,214
Killby & Gayford	4,587	Wells & Son	4,038
Thos. Gregory & Co.	4,338		

LONDON.—For the erection of a shop and store at Battersea, for Mr. A. F. Hall. Mr. Robert Burr, architect, 25, Fulham Park-gardens, S.W. Quantities supplied:—

Godfrey & Son	£778	W. Johnson	£707
Jarvis & Son	756	Thos. Gregory & Co.	671
Killby & Gayford	750	W. Hammond	655
Holloway Bros.	734	Wells & Son	581
Turtle & Appleton	730		

LONDON.—For additions and repairs to Devonshire House, Village-road, Battersea, for Mr. A. F. Hall. Mr. Robt. Burr, architect 25, Fulham park gardens, S.W.

Killby & Gayford	£490	Jarvis & Sons	£492
Turtle & Appleton	476	Godfrey & Son	388
Thos. Gregory & Co.	436	W. Hammond	365
Holloway Bros.	434	Wells & Son	310
W. Johnson	406		

LONDON.—For asphalting Farm-lane, Fulham, with 2-in. compressed asphalte on 6-in. concrete, area 1,540 square yards, for the Vestry of Fulham. Mr. James P. Sorrington, Surveyor to the Vestry.

French Asphalte Co.	£1,129	5	0
Val de Travers	1,172	15	0
Limmer Asphalte Co.	£1,176	5	

LONDON.—For completing baths and laundry, Mansford street, Bethnal Green, E., for Messrs. Garner & Halley. Mr. J. G. Needham, architect, 11, Powerscroft-road, Clapton, E. —

N. Thomas	£1,980
S. W. Hawkings	1,788
J. & F. Bane*	£1,375

* Accepted.

LONDON.—For building new premises, for Messrs. Hills & Chapman, 209a, Old Kent-road, S.E. Mr. F. A. Powell, architect:—

T. A. Rodwell	£2,195
T. Lapthorne & Co.	2,159
J. Stayner	2,147
Holliday & Greenwood	1,994
D. & W. Whitelaw	£1,850
H. Burman & Son*	1,800

* Accepted.

LONDON.—For alterations and repairs to 67, Watney street, St. George's-East, for Mr. George Whitmill. Mr. Fred. A. Ashton, architect, Stratford:—

North Bros	£385
J. & H. Cooks	375
J. H. Searle & Son	362
M. Calnan & Co.	£347
J. & F. Bane (accepted)	276
M. A. Palmer & C.	275

LONDON.—For the making up, channelling, tar paving, &c., of Poplar's-avenue, Willesden-lane, for the Willesden Local Board. Mr. O. C. Robson, Surveyor:—

Neave & Son	£448
Nowell & Robson	397
Ballar	£377
Bell	369

LONDON.—For pulling down and rebuilding three cottages at New Kings-street, Deptford, for Mr. George Beak:—

A. Wilson & Co., Braxfield road, Brockley*	£815

* Accepted subject to deduction.

LONDON.—For pulling down Nos. 35 and 37, Hoxton-street, Hoxton, and building furniture warehouse and workshops for Mr. Sydney F. Sloper. Mr. Fred. G. Grierson, architect, 9, Old Jewry chambers, Chapside, E.C.:

Evans & Co., Tavistock-place Russell-square, W.C.*	£1,200 0 0

* Accepted.

LONDON.—For rebuilding No. 68, New Park-street, Southwark, Mr. Martin L. Saunders, architect:—

Smith & Son	£1,142
B. E. Nightingale	1,072
S. J. Gerrard	£1,043

LONDON.—For alterations, &c., to 50, Brompton-square, S.W. Mr. C. J. Bentley, architect:—

Lansdowne & Co.	£1,347
Balsam Bros.	1,299
B. E. Nightingale	1,219
J. Bright	£1,217
Morrish	1,200
S. Hunt	1,195

LOUGHTON.—For new infants' school for the Loughton School Board. Mr. James Cubitt, architect:—

Channing & Son	£2,575
Rice	2,506
Foster	2,498
Cockrell	2,297
Carter	2,240
Gregar & Sch	2,230
Hall	2,209
Wells	£2,190
Watson	2,187
Lawrence	2,080
Arch Aged	2,075
Chessum	2,066
Everitt & Son*	1,967

* Accepted.

PORTSMOUTH.—For the removal of gardener's lodge and re-erecting the same at Stamshaw Recreation Ground, for the Urban Sanitary Authority. Mr. Phillip Hirsch, Borough Engineer, Town Hall, Portsmouth:—

J. B. Nobes & Son	£248 0 0
T. P. Hall	240 0 0
W. Learmouth*	180 0 0
A. Hunt	£98 15 6
* Accepted.	† Withdrawn.
[All of Portsmouth.]	

ST. LEONARD'S-ON-SEA.—For the erection of a new Wesleyan Chapel, New Park-road, St. Leonards-on-Sea. Mr. Philip Hy. Tree, architect:—

W. G. Morgan	£4,550
F. Jenkins	4,195
Taylor Bros.	3,710
Elder & Cruttenden	£4,177
H. E. Cruttenden	3,420

SHEFFIELD.—For the erection of schools and wall, asphalting playground, and alterations to building, at Crookes Board School, for the School Board:—

W. May	£208 0
J. Holmes	152 10
G. Longden & Son	212 0
A. Smith*	0 0
Asphalte & Bitumen Co.	£184 0

* Only quoted for portion of work.

† Accepted.

SOUTHEND.—For alterations and additions to the Menilva Hotel, for Messrs. Luker & Co. Mr. Edward Wright, architect:—

Archibald Ansell	£695
Dark & Son	917
Baker & Wiseman	887
Orfeur	£820
Dupont, Colchester*	800

* Accepted.

SOUTHEND.—For new offices at Southend Station, for the G.E. Railway Company:—

Archibald Ansell, Billericay accepted	£75 0 0

STRATFORD.—For erecting new granary, offices, stabling, &c., for Messrs. Gould Bros., Bow-bridge Works, Stratford, E. Messrs. Ransome & Unwin, architects, 26, Victoria-st., S.W.:

H. Wells & Son	£3,220
J. R. Hunt	2,985
G. Sharpe	2,980
Holliday & Greenwood	2,844
J. Jackson	£3,020
J. & E. Coxhead	2,744
J. & R. Carter, Mile End	2,648

SYDENHAM.—For additions, &c., to "Prince Alfred," Lower Sydenham. Mr. Fredk. West, architect, Croydon:—

Waddington & Co.	£195 0
Golder & Glasgow	176 0
T. W. Jones	£149 15
Bird	141 0

TOTTENHAM.—For the erection of a Salvation Army Citadel for General Booth. Mr. Gilbee Scott, architect, 101, Queen Victoria-street.

Sayer	£2,207
Munday & Co.	1,779
A. Monk	1,718
Arnold & Son	1,653
E. Bowyer	1,596
J. Linzell	1,493
W. T.	1,483
Fox & Ellwood	1,440
E. Lee	1,370
F. Cox	1,357
Ashby & Son	1,[illegible]
A. Watts	1,[illegible]

USWORTH (Durham).—Accepted for the erection of miners'-hall, institute, &c., at Usworth Colliery. Messrs Davidson & Bendle, architects, 33, Grainger-street West, Newcastle-on-Tyne:—

Mason and Bricklayer.—William Johnston, Flint Hill, co. Durham	£1,170 8 0
Carpenter and Joiner.—Wm. Surtees, Blackhill, co. Durham	378 0 0
Slater.—John Hewitson, Newcastle	127 0 0
Plasterer.—Wm. Johnston, Flint Hill, co. Durham	84 0 0
Plumber.—L. Unwin, Shotley Bridge, co. Durham	73 0 0
Painter and Glazier.—John Thirlwell, Shotley Bridge,	42 2 0

WAKEFIELD.—Accepted for re-roofing the dyehouse at Providence Mills, for Messrs. Geo. Lee & Sons, Limited. Mr. William Watson, architect, Barstow-square, Wakefield:—

Brickwork.—Flower Bros.	110 0 0
Slating.—C. F. Rycroft	151 10 0
Carpenter and Joiner.—Chas. Squires	778 10 0
Plumbing, Glazing, &c.—Ed. Kirk	290 10 0
Painting.—C. Turner & Sons	57 10 0
Total	£1,335 0 0

[All of Wakefield. Thirty-four tenders received.]

WARWICK.—For building four houses for the Warwick and Warwickshire Building Society. Mr. F. P. Trepess, architect, 8, Jury-street, Warwick. Quantities supplied

Full	£1,070 0 0
Atkinson	909 0 0
Tallins	898 0 0
Bailey	844 16 0
Chaplo	£830 0 0
Robbins	798 10 0
Lee, Leamington*	660 0 0

* Accepted.

WOBURN.—For building stables to "Wavendon Towers," for Lieut.-Col. Burney. Mr. Chas. Granville Baker, architect, 5, Bloomsbury-square:—

Samuel Foster, Bedford	£540 0 0

YORK.—For the erection of a wall palisading and gate, Tulford-road, for the Corporation. Mr. Alfred Creer, C.E., City Surveyor, Guildhall, York:—

J. Hebden	£118 14 5

YORK.—For the supply and erection of two cab-shelters, for the Corporation. Mr. Alfred Creer, City Surveyor, Guildhall, York:—

B. Hughes, York	£102 1 4

Conveniences, Newington.—Mr. J. G. Stidder asks us to rectify a clerical error in his tender for London for conveniences at Great Dover-street for the Newington Vestry, in the *Builder* of February 14. It should read 1,945l. 18s.

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E. D.—H. & R.—A. F. K. (drawing shall appear if space permits).—"Combination Lock" (we cannot notice anything of this kind on the basis of a description forwarded with no address and no diagram, or specimen of the lock).—C. S. (too late for this week).—J. B. (ineligible for insertion on account of non-compliance with our rules).

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The Builder.

Vol. LXI. No. 2569. Saturday, March 7, 1891.

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*Life of Ericsson.**

JOHN ERICSSON died on the morning of March 8, 1889, and on the same day the Legislature of the State of New York passed an Act authorising the City of New York to expend 10,000 dols. in erecting a monument to him in one of the public parks. The Swedes, headed by their King, begged for the body of their distinguished countryman, and on Aug. 23, 1890, whilst minute-guns were fired from the monitor *Nantucket*, and the colours of the squadron especially assembled at New York were lowered to half-mast, his coffin was borne through the thronged streets of that city, and placed on board the *Baltimore* frigate, by which it was duly carried to his native land. Perhaps nothing could indicate more clearly the appreciation of the worth of this great man than the few eloquent words which were uttered by the Hon. W. N. Thomas, the Minister of the United States in Sweden, on delivering his body to his own countrymen at Stockholm:—

"I transfer these honoured ashes with all reverence, for well I know how grandly the hand that now lies cold and still within this casket has wrought for America and for humanity. At a critical moment in the history of the United States, John Ericsson, by the creation of his genius, rendered illustrious service to his adopted country, and saved her from great peril. And the Republic is not ungrateful. Lovingly as Agrippina bore home to Rome the ashes of Germanicus, so tenderly and honourably America brings back the body of Ericsson, that the land which was his cradle may also be his grave. The body of Ericsson we restore to you, but his memory we shall ever retain in sacred keeping; or rather we will share it with you, and with the whole world."

So was the body of the man whom the Swedes delighted to honour carried by them over the railway which his brother Nils had built, and his son Hjalmar had superintended, to Filipstad, among the Vermland hills.

From the biography which has been compiled by Colonel Church, under the instructions of the executors, those who were not previously acquainted with the causes may now learn why such signal honours were paid to this man, and, by the perusal of these two volumes, learn nearly the whole story of his life of eighty-five years. It is not all, though it probably contains all that would have a professional interest for most of us; but, in 1886, he appears to have been so disgusted with what appeared to him the indiscreet exposure of many parts of the domestic life of Carlyle, that he at once destroyed his diaries, containing the entries of fifty years, which had been carefully bound, and were apparently ready for the transcriber of his life. But, though he had lived, so to say, as a hermit for many years before his death, and had declined to allow his time to be occupied by the society of others, his works were known, his writings, and calculations, and drawings were accessible, and his biographer had nearly twelve thousand papers transferred to him as matter for his pen. We may say at once, before proceeding to give a short account of his life, that we have never perused a more fascinating biography. It is a well-told tale of a man who, without any special advantages of birth, but with extraordinary powers of brain and of will, drove through difficulties of all kinds in Sweden, in England, and in America, who sacrificed most things that ordinary mortals care for, such as wife, children, society, and comfort, to the solution of problems for the benefit of his fellow men, and whose ruling idea for many years appears to have been the economy of his time and the prolongation of his life, in order that he might be useful to mankind.

The natural industry of the man was developed in his earliest childhood; for, if we are to accept the statement of his biographer as correct, the spirit of invention and of disinclination to accept anything as incapable of improvement, prompted him when learning his letters to draw in the sand characters that suited his fancy better than those of the Swedish alphabet. Running loose as a child, firstly in the mines of which his father was part owner, and afterwards in the works of the Göta Canal, where his father was employed, the study of the machinery was to him an endless source of delight, and with any materials on which he could lay hand, he would draw and model it. The year 1808 took Telford to Sweden to furnish designs for the completion of the Göta Canal, the grand work which had been proposed during the time of Gustavus Vasa, and commenced by Swedenborg, and as the lad soon got permission to frequent the drawing office,—for he was an insatiable draughtsman,—we find him at the age of eight able to make a drawing to scale; at nine, to make his own drawing instruments; at ten, to design a saw-mill and a mine pump worked by a windmill,—a thing he had never seen; at thirteen, appointed an assistant leveller; and at fourteen-and-a-half, a leveller on the canal works, with a substantial salary. We cannot, therefore, be expected to agree with the author when he says (see p. 21) that "he was not precocious," especially when he speaks of him in the same page as a "youthful prodigy," which we most readily endorse.

Telford imported into Sweden at this time, for the service of the Government canal, a good many Englishmen, from whom young John soon learned English, and he shortly afterwards joined as a cadet the Swedish Corps of Mechanical Engineers, under the instruction of some officers who had been to England to learn canal construction. Brought into contact with the troops which were employed on the canal works, the young man next aspired to martial deeds, to break away from the bonds of routine, and to lead the life of romance and adventure which, to his imagination, seemed to lie beyond. And so, heedless of the remonstrance of his friend and patron, Count von Platen, who was director of the canal works, and who, finally, out of all patience, told him to "go to the devil," he obtained a commission as ensign in the 23rd Regiment, in which he was afterwards gazetted captain. As an indication of the satisfaction with which he always regarded his somewhat short military career, he always preferred to be known as "Captain Ericsson," though he in time became the recipient of five different orders of Knighthood. He appears to have been a man of extraordinary muscle as well as brain, for it is stated that at the age of eighteen he lifted a cannon weighing 600 lbs., and the author gives in the course of his life other instances of his prodigious physical strength. The revival of the art of weight lifting, and the records of the achievements of the strong men now exhibiting in England, enable comparisons to be drawn, and we

* "The Life of John Ericsson," by William Conant Church. 2 vols. Sampson Low, Marston, Searle, & Rivington. 1890.

cannot but be slightly sceptical about the accomplishment of the above-mentioned feat. We are not surprised to hear that he injured his back. Topographical drawing was now taken vigorously in hand, and he was appointed to assist in the survey of Jemtland. To this work pay was determined according to amount of work, and we are informed, that "so indefatigable was his industry and rapid his execution, that he performed double duty, and was carried on the pay-roll as two persons in order to avoid criticism and charges of favouritism."

At the age of eighteen he decided to publish, in connexion with a Major Pentz, who was to make a German translation, a full description of the locks and appliances for canal work, based on the mechanical drawings he had previously made, and, believing that he could himself do the work of engraving if he could find out how it was done, he applied to a leading engineer in Stockholm for permission to examine the tools of his trade. On this being refused, he at once designed a machine for engraving, and shortly produced work surpassing that of experienced artists. As a matter of business this, however, was a failure, for the swift changes in the application of machinery and the use of new methods put his work out of date long before he got far advanced in it.

He now, at the age of twenty-one, turned his attention to a subject suggested to him by some experiments made by his father, and conceived the idea that flame might be used in a receiver corresponding to the cylinder of a steam-engine, by means of which he hoped to obtain power equal to that of steam, with less expenditure of time and fuel. He constructed and set in motion a machine to illustrate this principle, and to his delight discovered that it worked perfectly, and developed several horse-power. This was the turning-point of his life. He abandoned the military profession, came to England to make his fortune with his flame-engine (a brother officer having lent him a thousand crowns), and sent to the Institution of Civil Engineers in London a paper entitled "A Description of a New Method of Employing the Combustion of Fuel as a Moving Power." During the whole of the remainder of his life, *i.e.*, for over sixty years, Ericsson, though he devoted his attention to many other matters, never relinquished his grasp on this subject, the supplanting of steam by some more economical motive power, a power which could be produced with a greater economy of coal; and though by successive improvements he accomplished many partial successes with a good financial result, notwithstanding a total expenditure of 60,000 dols. on experiment, he succeeded no better than the late Sir William Siemens and others in the invention of caloric engines which (beyond a comparatively small limit of horse-power) are economical. The successors to the flame-engine, namely, the gas, oil, oil-gas, and other heat-engines of the present day, when constructed beyond a certain size, still have this defect of being not economical, the cost of producing an unit of motive power being generally greater with any of these varieties of fuel than with ordinary coal. He as fully realised as did the late Professor Fleeming Jenkin, the tremendous responsibilities we are incurring as spendthrifts in our consumption of coal, recognizing the fact that 96 or 97 per cent. of the energy stored up for us is now being utterly wasted by the people who burn coal in steam-engines of small power,* and we are again reminded by an extract in this work from Sir F. Bramwell's address to the British Association in 1888, that there must be "a future for motor-engines worked by the vapour of some of the more highly volatile of these products —true vapour—not a gas, but a condensable body capable of being worked over and over again."

Undoubtedly the chief improvement, that which made caloric engines practically successful, has been that known as the application of the regenerative principle. This was first applied by Ericsson in 1837, and the claim made by him as its originator is one which will probably be admitted, notwithstanding the slight mention of his share in this branch of mechanical science, which will be found in the latest English works on the subject.

During the last twenty years of his life, *i.e.*, soon after the close of the American War of Secession gave him time, as it had given him the means, to devote his attention more particularly to work of that kind which is usually described as unremunerative, he proceeded to make thorough investigations into the possible utilisation of the heat of the sun, and the characteristics of solar radiation. The development of his caloric engines, and his intense desire to economise coal, naturally associated him with work of this kind, and, as an indication of the distance to which his mind was continually probing the future, we quote a few lines from his valuable "Contributions to the Centennial Exhibition" in New York:—

"Due consideration," he says, "cannot fail to convince us that the rapid exhaustion of the European coal-fields will soon cause great changes with reference to international relations in favour of those countries which are in possession of continuous sun-power. Upper Egypt, for instance, will, in the course of a few centuries, derive signal advantage, and attain a high political position, on account of her perpetual sunshine, and the consequent command of unlimited motive force. The time will come when Europe must stop her mills for want of coal. Upper Egypt, then, with her never-ceasing sun-power, will invite the European manufacturer to remove his machinery and erect his mills on the firm ground along the sides of the alluvial plain of the Nile, where an amount of motive-power may be obtained many times more than that now employed by all the manufactories of Europe."

Colonel Church states with fairness the work which has been done by other investigators into this field of research, and his thirty-sixth chapter is illustrated with diagrams of several sun-motors and solar engines extracted from the above-mentioned "Contributions to the Centennial Exhibition." Ericsson ultimately succeeded in making a sun-motor with silvered glass, which produced one-horse power per ten square feet of mirror under continuous exposure to the sun, the concentrated solar rays producing 400 revolutions per minute on the engine. He satisfied himself that "the sun-motor is nearer perfection than the steam-engine; but until the coal mines are exhausted its value will not be fully acknowledged," and in a letter in which he referred to the experiments carried out in India by Mr. W. Adams, he concludes as follows:—"The fact is, however, that although the heat is obtained for nothing, so extensive, costly, and complex is the concentration apparatus, that *solar steam* is many times more costly than steam produced by burning coal." With that conclusion we may dismiss the further consideration of this section of the great inventor's life, and return to the contemplation of his work whilst in England.

His mechanical genius was so apparent that he very soon became the junior partner in the firm of "Braithwaite & Ericsson." In 1828 he constructed, and put into successful operation at the tin mines near Truro, an air-compressor for raising water from the mine-shaft, and upon this invention founded his claim to priority in the practical use of compressed air for transmitting power. Previous to this, in 1827, surface-condensing engines for the *Victory*, for an Arctic expedition under Captain Ross, had been supplied. These were not a success, but the reason is satisfactorily explained by the author of this work, and their failure in this particular instance in no way detracts from the value of the invention of surface condensation. In 1828 the firm produced a steam fire-engine, which was used in London gratuitously, and appears to have been most successful in every way except one, the exception being the attempt to get it generally introduced. It is curious to read now the objections that were urged against it, which are recounted as follows:—"To be good for anything it must constantly have a fire alight or the steam kept up, as it would otherwise take too long to bring it into operation"; and again, "it was too powerful for common use, too heavy for rapid travelling, and required larger supplies of water than could be obtained in London streets. Even if the steam fire-engines could get water, it would not be desirable to use them, as the quantity of water thrown by them might be injuriously applied and cause mischief." And so, although Liverpool and Berlin were supplied by the firm with steam fire-engines, and in 1840 Ericsson, after his departure for America, supplied them to New York, it was not until the year 1860, *i.e.*, after a lapse of *thirty-two years*, that London adopted them.

We now come to that most interesting part of the work which relates to the share John Ericsson took in that which is possibly the most important event in the history of mankind, the introduction of the locomotive steam-engine. It will be remembered that in 1829, the directors of the Liverpool and Manchester Railway, having arrived at no sort of decision as to the means of locomotion on their line, which was then under construction, offered a prize of 500*l.* for the best locomotive steam-engine. George Stephenson had for some time been urging on them this system of locomotion, based on his experience in Northumberland. Several engines were entered for the celebrated trial which took place at Rainhill, which was so graphically described in the *Times* of that date, and has so often formed a subject for dilatation amongst engineers and others, but there were only two engines which in any degree were capable of complying with the necessary conditions—Stephenson's "Rocket," and Ericsson's "Novelty." Ericsson himself was evidently dissatisfied with the judges' decision, as we may gather from a memorandum published in this work, in which he says, "it is difficult to see how, if the contest had not been abandoned, the judges could have refused awarding the prize to the 'Novelty,' in view of her greater speed than the other competing engines, and in view of her superior principle of construction compared with the 'Rocket,'" and he especially stigmatises the account given by Smiles as *garbled*, but we think that Colonel Church has presented the matter with perfect fairness, and he discreetly declines to put forward any especial claim on behalf of Ericsson beyond that which every one was prepared to, and, we believe, has always admitted, namely, that the production of the "Novelty" was an act of extraordinary merit. This engine was planned and built in seven weeks, and beat the "Rocket" for speed. The relative experience in such work of George Stevenson (assisted by his son Robert), and John Ericsson (assisted by Braithwaite), was also very different, the one having been constantly employed in and about the collieries, where locomotive engines had been at work for some years, whilst the other produced the engine spontaneously. The main cause of success in the "Rocket" and failure in the "Novelty" was the arrangement of the tubes in the boiler, the former having them in separate lengths firmly secured at the ends, whilst in the latter they were in one spiral coil. In both cases was forced draught used, but in the "Novelty" it was too powerful for the helical tube, which gave way repeatedly until she had to be withdrawn from the contest. There is no question,—and it is not to be assumed that Colonel Church opens one,—about the 500*l.* prize having been most properly adjudged to George Stephenson, or about his having completely earned the laurels with which his countrymen and the world at large have crowned his memory.

It may not be generally known that at one time Ericsson was superintending engineer of the Eastern Counties (or Great Eastern) Railway, but there is nothing to show, either in this work or any other, that he ever built a locomotive railway engine that was practically useful, though it is stated that in 1830 he applied for the first time the link motion for reversing steam-engines, of which the so-called Stephenson link is a modification.

But his failure to secure the much-coveted prize at Rainhill was no damper to his energies,

* "Heat as a Means of Motion," Inst. C.E. papers, 1886.

and in one respect was, in his own opinion, a matter for congratulation, for it diverted his attention to steam navigation, and in 1838 he designed an engine for the *Robert F. Stockton*, which was the first direct-acting screw-propeller engine ever built. Propulsion by means of a screw had been patented by him two years previously, but it was the application of the direct action which made it a practical success. The screw was applied by him to the engines of the *Francis B. Ogden*, and the author gives a remarkable account of the negotiations with our Board of Admiralty, and states that Sir William Symonds, the Surveyor of the Navy, remarked that "even if the propeller had the power of propelling a vessel it would be found altogether useless in practice, because the power being applied in the stern it would be absolutely impossible to make the vessel steer." Admiralty and engineers generally were dead against it; Ericsson's inventions did not pay; the firm of "Braithwaite & Ericsson" failed, and the subject of this biography enjoyed for a time the hospitalities of the Fleet prison as a foreign debtor. However, he had patented his screw-propeller in America, and the *Stockton*, built by Laird, of Birkenhead, and measuring only thirty tons, crossed the Atlantic under sail, and arrived safely at New York, where her captain was presented with the freedom of the City in admiration of his daring. A few months more and Ericsson closed his accounts with this country and proceeded to America.

Immediately after his arrival he established business relations with the Phœnix Foundry in New York, relations which from that time forward for fifty years were never disturbed, and it is a most remarkable fact that he and the junior partner, Mr. Cornelius H. Delamater, worked together for all that time, and died within a month of each other. Their struggles with the Navy Department in America are most graphically described by Colonel Church; their financial difficulties, caused by the extraordinary proceedings of that Department; the success of the big wrought-iron gun, (a 212-pounder) built at the Mersey Iron Works, near Liverpool, in 1839, taken by him to America and mounted in the *Princeton* (the first screw-propelled warship), are all told, and the effect of this on naval construction throughout the world is described as having been so important as to have started the war between armour and projectiles which continues to this day, and will, perhaps, continue for many a long day to come. It is worthy of note that the screw propeller and engines for the first British frigate (the *Amphion*) which was so provided, were supplied by Ericsson's agent in England from his designs. This was in 1844, a year after the French Government had been similarly provided by Ericsson's agent, Count Von Rosens, for the *Pomone* frigate. The effect is thus described by Lieutenant Jacob Miller, U.S.N:—

"The *Princeton* gave a warning on both sides of the Atlantic of the changes that were to ensue. Congress resounded with eulogies of the genius which would enable us in the near future to defy the navies of Europe. Parliament (of England) perceiving the error the Admiralty had made in driving the Swedish inventor from England, voted large sums of money to build trial propellers and built-up guns. The British foundries were ready for the emergency; stimulated by the success of their first iron steamers, they hastened to increase their plant so as to include the fabrication of iron plates for iron men-of-war. The age of iron had begun."

It has sometimes been advanced as an argument in favour of safety from risk that those who do nothing cannot make mistakes, and doubtless the converse holds good. To such a rule, if rule it be, Ericsson was certainly no exception, and sometimes his mistakes were very expensive. For instance, we find that, embued with his desire to utilise hot-air in place of steam, he induced some people to allow him to apply it to marine engines, the result being the caloric ship *Ericsson*. She cost about half a million dollars, her engines costing 130,000 dols. She was launched, successfully tried, the mechanism being perfect, and, except by the *Scientific American*, duly praised. "The age of steam is closed," said one of her admirers. The history of her failure is peculiarly interesting. She only realised a maximum of eight knots in her trip to Washington. She sank in a hurricane near New York, was raised and fitted with steam-engines, and, finally, Ericsson himself admitted that it settled the vital question of whether heated air as a motor could compete on a large scale with steam.

But great as was the fame which had already attached to Ericsson as a master of mechanical science, his greatness would, perhaps, never have been crowned so signally had it not been for the rupture between the Northern and Southern States in 1861, and the bitter war which for four years was fought between these brothers in America. In August, 1861, an advertisement inviting proposals for ironclad steam vessels was issued from the Navy Department and Ericsson promptly offered to build a warship in ten weeks. All this portion of Colonel Church's work is of intense interest; the history of the negotiations which culminated in Ericsson receiving the verbal order from Secretary Welles to build *The Monitor*, the doubts and distrusts of naval men, the determination of the Navy Department to alter her rudder, are splendidly told; the way in which this piece of news was received by Ericsson is described as follows:—"The hot Scandinavian blood flushed his cheek, his eyes gleamed, his brow darkened: and this time the storm broke in all its fury. With the full volume of his tremendous voice, and with a mighty oath, he thundered, 'The *Monitor* is MINE, and I say it shall not be done.'" We are not surprised: he was working for fame and not for gold,—for patriotism and honour. As Professor MacCord (quoted by the author) said in 1889, in the *North American Review*, "The *Monitor* was *his*, for from turret to keel plate, from rudder-shoe to anchor-well, every distinctive feature was the creation of his brain, every detail was stamped with the evidence of his handiwork." It is stated that, as a matter of fact, the entire labour of preparing the original working drawings, about one hundred in number, including even the gun-carriages, were made by him, every line being drawn with his own hand. Within one hundred days from laying the keel, the vessel was completed, and the engines put in motion under steam, and this at a time when good workmen were scarce, for the dominant military spirit had called to the field of battle the best men in every calling. It was estimated by Isaac Newton, the first engineer of the *Monitor*, that she contained at least forty patentable contrivances, but he declined to patent any of them. "I intended it," he said, "as a contribution to the glorious cause of Union."

The contest between the Confederate *Merrimac* and the Federal *Monitor*, on March 9, 1862, is a matter of history with which few people are, or ought to be, unacquainted. If so, they cannot do better than peruse the vivid account of it given by Colonel Church. But the conditions under which the *Monitor* entered on the fight are not so generally known. On the day on which she was finished at New York, armed with untried guns, and manned by an untried crew, she was towed off to Hampton Roads, arrived there one evening, and went straight out the next morning to fight the ship which had created such a sensation on the previous day by sinking the best wooden frigates in the Federal navy. The following extract from a Minute by the Secretary of the Navy Department will also show the extraordinary kind of encouragement with which her constructors had been fed:—

"So soon as the vessel is ready for service, the Government will send her on the coast, and put her before the enemies' batteries, in the service in which you intend her. No other test can be made to prove the vessel and her appointments than that to which both parties agreed to expose her; in fact, it is the gist of the intentions of the contracting parties. The plan is novel, and because it is so, the Government requires the designer to *warrant* its success. Placing the vessel before an enemy's battery will test its capacity to resist shot and shell,—that is the least of the difficulties I apprehend in the success of the vessel which you set forth as of great merit. The Government cannot consent to receive the vessel until she shall have been tested in the manner proposed."

There was very different language after the fight; the quarter reserve on the contract was promptly paid, and all the people fell down and worshipped John Ericsson. So the ideas of naval construction were much upset, and the "cheese-raft," as some one styled her, became the type from which *Captains* and *Monarchs* and *Inflexibles*, and many more or less imperfect turret ships, have been evolved.

The immediate effect on the war was immense, for her failure would have been equivalent to the raising of the blockade of the Southern harbours and the free ingress of supplies of all kinds from Europe for the use of the Confederate States, the absence of which brought the war to a close by the natural process of exhaustion. It is not our province to discuss whether her success was or was not, as stated, "an awful pill for John Bull." Some allowance must be made for transatlantic bombast, especially at that particular period, but we recollect full well that, Monitors or no Monitors, if Great Britain had not received full satisfaction for the insolent removal of Messrs. Mason and Slidell from one of our mail steamers, the excitement in this country at the time would have led to an immediate declaration of war.

The time came when it was no easy matter to get a good ship built, with a million and a-half of men in military service; the fleecing of the Government by incompetent designers and contractors, and by contracts being politically distributed, is well set forth in this work, and is a significant commentary on the advantages which are generally taken by certain persons in every nation when she is in the throes of a struggle for existence. Sixty-two millions of dollars appear to have been expended on the hulls and engines of vessels which had to be condemned and broken up within a short time, many of them having been utterly worthless from the beginning.

Much of this portion of Colonel Church's work is devoted to the progress of this great civil war, and to the important share taken in naval construction by Ericsson and his partners. The brains and the hands of these men never rested. Ericsson's genius had inspired with the fullest confidence two men of great weight and influence in the Navy Department, namely, the Secretary, Mr. Welles, and the Assistant-Secretary, Captain Gustavus Vasa Fox, the latter being possibly in some way connected with Sweden. They both appear to have stood out very prominently at that time of trial as men of conspicuous sagacity, for it was no easy matter to decide correctly and promptly when so many designers (in more ways than one) were showering plans and projects and applying pressure of all kinds to obtain recognition. They knew, however, that the *Monitor* was no fluke, that she was the result of perfectly accurate calculations. She had, in fact, been designed during the Crimean war eight years previously, Ericsson having then sent plans and descriptions of her to the Emperor Napoleon, with the object of damaging Russia, whom he regarded as the hereditary enemy of his native country. They were, however, declined with thanks, and the iron-sided ship with which we are all familiar was then adopted by France, copied by England, and is constantly being reproduced for maritime powers in exaggerated forms and at enormous cost.

This work contains an immense amount of information on naval construction, on attack and defence of ships and coasts and harbours, on the effect of guns above and guns below the water-line, on torpedoes stationary and torpedoes locomotive, and on many other diabolical contrivances for extinguishing human life. The conclusions arrived at by Ericsson on all these matters and on points of detail are so closely and logically argued, that the reader, whether civil or military or naval, cannot fail to have his feelings

of admiration excited in favour of this clear-headed and patriotic man. He had much to teach and men had much to learn, but he seems to have been often irritated at what seemed to him the inconceivable stupidity of others, and to have shown without reserve his poor opinion of other people's brains and sense; had it not, therefore, been for his friends Welles and Fox, the comparative wealth which at last came to him (by means of ship contracts) would never have been acquired. Long after the Civil War had ceased, Ericsson continued to exercise his inventive faculties in the manner above mentioned, and his "Destroyer," which is fully described and well illustrated in this work, would seem to be an embodiment of all that is required for a perfect harbour defence vessel. On these and other scientific matters, he appears to have had much correspondence with that eminent authority on mechanical science, Mr. John Bourne, and with *Nature* and *Engineering* in this country, much of the latter having been reproduced in his important and scarce work previously referred to, viz., "Contributions to the Centennial Exhibition." This work was originated by a singular piece of neglect, to which he thus alludes in his quaint commencement of the Preface: "The Commissioners having omitted to invite me to exhibit the results of my labours connected with mechanics and physics, a gap in their record of material progress exceeding one-third of a century has been occasioned."

The admiration with which the author of this work regards the subject of his biography is very clear, and it is a feeling which those who read it will find difficult to resist. If anything further were needed to stimulate this it would be found in the breadth and nobility of his remarks on the influence of mechanical improvements in reducing the tendency of civilised nations to declare war on each other. "The art of war," he says, "is positively in its infancy. When perfected, man will be forced to live in peace with man; and the surest way to discredit war is to direct all the resources of mechanical ingenuity to making it a pastime at which not even kings can afford to play."

There are so few imperfections, such very trivial errors in this very candid history of this extraordinary man of genius, that it is hardly worth while to draw attention to them. The book will take a permanent place among the best biographies of the class to which it belongs.

NOTES.

A NUMBER of architects, members and non-members of the Institute, and some painters and sculptors, have addressed what seems to us a rather uncalled-for memorial to the Institute of Architects recording their opinion that "any attempt to make architecture a close profession, either by the Bill now in Parliament or by any similar measure, is opposed to the interests of architecture as a Fine Art." The memorial proceeds as follows:—

"We believe that while it is possible to examine students in construction and matters of sanitation, their artistic qualifications, which really make the architect, cannot be brought to the test of examination, and that a diploma of architecture obtained by such means would be a fallacious distinction, equally useless as a guide to the public, and misleading as an object for the efforts of the student.

Architecture has for some time been less constantly associated with the sister arts of painting and sculpture than in our opinion is desirable, and we think that examinations and diplomas, by raising up artificial barriers, would have a tendency still further to alienate these branches of art.

We think that no legislation can protect the public against bad design; nor could legislation help to prevent bad construction unless builders and all others who erect buildings were required to pass the test of examination as well as architects, inasmuch as architects are not employed in the majority of cases."

It appears to us that the promoters of this memorial have taken fright at a long report in the *Journal of Proceedings* of February 19, giving the results of the recent French Commission appointed to inquire into the question of a diploma for architects. The report was simply a report, giving information on an important inquiry, and expressing no opinion at all. We are opposed to a diploma, and concur in the reasons against it mentioned in the memorial, but we do not see that the institution of an examination on practical subjects, as a test of entry to the Institute ranks, can possibly do anything but good; and we have seen no reason yet for concluding that the Institute are plotting anything further than that. They wish, of course, that all architects should be members of the Institute; so do we. Here are twenty-two architects, not members of the Institute, signing this memorial against some imaginary intention of the Institute. If those twenty-two became members of the Institute instead of standing aloof and signing resolutions, they would have it in their power to assist the most artistic set of men within the Institute, and to carry things forward in the right direction. Instead of that, they prefer to stand outside and grumble, and expose the profession to the taunt which the engineers are always directing against it, that it is a profession whose members can never agree among themselves. Further than this, the memorialists send their memorial to the *Times* prefaced by a letter in which it is stated that it is no secret that some of those who join in opposing the measure that has been endeavoured to be thrust into Parliament "are doing so in the hope of substituting another measure of their own." This is a most ungenerous and uncalled-for insinuation, and amounts to a misrepresentation. The measure was opposed for reasons which must be perfectly obvious to all who know the circumstances; which all our readers know perfectly well; reasons connected with the origin of the measure, the manner in which it was "pushed," and the status of the persons concerned in it. The Institute were contending against a measure which meant the degradation of the profession at the hands of a totally unimportant minority. Instead of showing any sympathy with their efforts, the outsiders, as well as some of their own body, proceed to exhibit to the public afresh the spectacle of the architectural profession divided against itself. They will hardly make it more respected by that means. As to the other artists who have signed the memorial, their names can have little weight in the matter, seeing that painters and sculptors in general have very little idea what architecture really means, and certainly do not know good detail from bad detail.

THE report of the sub-Committee of the Manchester Corporation as to the Ship Canal, which was issued on Wednesday night, is a melancholy document. It finds that the total capital of the company is 10,900,000*l.*, that 9,000,000*l.* have been spent, and that 3,900,000*l.* are still required, and it recommends that the city of Manchester should advance the necessary sum on the security of debentures. If assistance is not at once given, the works must be stopped. It is obvious that even if the money is found, such an immense increase in the original capital of the company must seriously affect its ultimate success as a commercial undertaking. Again, if the city of Manchester advances the money, it will create a very dangerous precedent, and attempts will be made by promoters of companies to obtain assistance from other corporations. The outlook is bad in every sense, and there can be no doubt a serious crisis in the affairs of the Ship Canal is at hand. What may be the results, it is difficult at present to see.

IT appears that the railway men of South Wales have taken to heart the moral of the Scotch strike. It was a matter of course that they should be approached by the dockers' representatives as to whether they were prepared to show their sympathy with them by coming out on strike, and at a meeting held last Saturday to consider the situation the following remarkable resolution was passed:—"That the sympathy of this meeting of railway men is hereby given to the dockers and seamen on strike, and it is hereby further resolved to do all that can legitimately be done to help them; but seeing that our rules and *our duty to mankind* compel us to use and exercise all conciliatory means before resorting to extreme measures, a deputation of railway men be appointed to wait upon Sir W. T. Lewis, and lay before that gentleman and the Shipping Federation the distress and misery and disaster to the trade of Cardiff and the district generally, as well as to the women and children, which a continuance of the present unfortunate dispute would carry with it." The words we have italicised justify us in terming this resolution a remarkable one, as there has been little or no consideration shown for any one but self in recent labour disputes. The Welsh railway men are certainly not losing sight of their duty to themselves as well as to mankind generally, and are acting wisely in trying to steer clear of a dispute which does not affect them personally. Many men who were perfectly contented with their lot have been called out to "sympathise" with grievances they have never really understood, placing themselves in the position of the Irishman who, when asked what it was that he and his countrymen were contending for, replied, "I can't tell ye what it is we want, sor, but by the powers we're determined to have it!" And the consequence, moreover, has frequently been that they have remained "out" after the aggrieved ones have (or have not, as the case may be,) got what they wanted.

FROM some questions addressed to the First Commissioner of Works on Friday last week, in regard to the proposed Kensington and Paddington subway, and the answers to them, it appears that this "subway" which is to run under Kensington Gardens, is proposed to be made as an open cutting and closed in afterwards, and we are told that "the course proposed is to construct the railway in sections, so that only a small portion of the gardens would be interfered with at a time." This is a new light on the scheme. This benevolent proposal to do the work in sections does not alter the fact that the work will for an indefinite period of time ruin everyone's enjoyment of Kensington Gardens, and very probably leave its permanent mark behind; and we are of opinion that in the interests of the public it should be definitely stopped. We are the last to oppose railway schemes when they are in any way reasonable, but this is a spoliation of our best public pleasure-ground for the interests of a scheme which we do not believe the public at large in the least want or require. Fortunately Kensington Gardens is Crown land; the consent of the Crown must be gained, and we hope it will be withheld.

ON Sunday last a grand memorial celebration of the memory of Schliemann took place at Berlin, under the auspices of the Municipality of the city, the Archæological, the Anthropological, and the Geographical Societies, in each of which bodies the deceased had held honorary positions Invitations, jointly signed by the "Oberbuergermeister" of the city and the presidents of the above societies, Messrs. Curtius, Virchow, and Reiss, had been issued to a limited number of the highest Court and Government officers and the leaders of the scientific and artistic world. The main hall of the building (but lately redecorated and lighted by electricity) had been tastefully adapted to the purpose of the day by the aid of elaborate floral arrangements, in the centre of which the bust of the deceased discoverer had been placed, and in this hall the guests of the above bodies, whose members had assembled in full force, were received by the committee of management. The celebration commenced appropriately with Beethoven's "Ruins of Athens" music, and a greeting to the assembled company was spoken by a member of the Municipality in lieu of the "Oberbuergermeister" (who had

unfortunately had an accident the day before the celebration), and in this opening address special stress was laid on the benefits which Schliemann had conferred on the city by the donation of his collections. Then followed the great event of the celebration, the address on Schliemann's life, spoken by his great friend, Professor Rudolf Virchow, who, in a fine speech of one and a half hour's duration, cited the more important points of Schliemann's life, and mentioned how it came about that the Schliemann collections had been unexpectedly presented to the German Empire, in 1881; stating that according to a letter from Mrs. Schliemann, written January 29, 1881, it was Mrs. Schliemann who had directly caused this benefit to be conferred on Berlin instead of London, Virchow himself having already worked towards this end in 1879, when he had heard from Schliemann's lips that Germany was considered by him to be that country in which Homer was most esteemed, and where his collections would interest a greater percentage of the people than anywhere else. The learned Professor alluded to Schliemann's grateful feelings towards England and the English-speaking population of the world, and then touched on the circumstances under which the deceased, a German by birth, but a long resident in Russia, had had the rights and advantages of an American citizen, in which country he had been naturalised in 1850. In summing up, Virchow enthusiastically referred to Mrs. Schliemann's influence on her husband, speaking of her as a "wonderful woman" ("herrliche Frau"). The president of the Geographical Society followed with a few short but feeling words on Schliemann's work as regards to the benefit derived from it for geographical research, and Professor Curtius, as President of the Archæological Society and curator of the classical museums, completed the list of speakers by a speech which was received with the greatest enthusiasm. This epilogue to the proceedings (which was followed by a few bars of music, bringing the celebration to a close) was short in itself, but to the point, and admirably delivered. In the course of it Professor Curtius observed that Schliemann's discoveries had not only been of assistance to the limited number of persons interested in archæology, but of assistance to the whole of the civilised and educated world. It was a great loss to the world that Schliemann had not been able to commence investigations on Crete. This island must be regarded, he said, as Schliemann's bequest to the scientific world of Germany, which must take up his work, and must strive to fill the gaps which he had left. In conclusion, Professor Curtius said that whatever differences there may be as to details of the results obtained by Schliemann, he could never be forgotten for many a century to come.

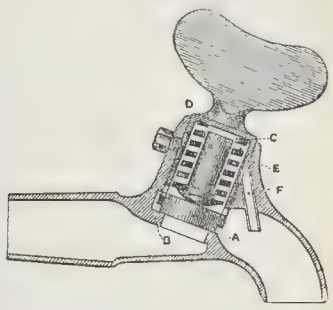
THE German press is bitterly sarcastic on the subject of the French and the Exhibition, and especially in regard to the conduct of the Paris Committee and its president, M. Detaille, who but a few weeks ago was so full of grand phrases on the impropriety of the French artists being influenced by Chauvinism, and now (after having been to Berlin and arranged everything for the French Group) not only backs out of the affair himself, and dissolves his committee, but also, in a letter to the *Petit Journal*, expresses the hope that his fellow-artists will follow his example. It is a pity that the Emperor's wish for friendly relations has been thwarted, as of late years the breach since 1870, especially in the scientific and art circles in Germany, had become healed to a great extent, and Berlin would have been only too pleased to see the Republic well represented at its Exhibition. Now unfriendly feelings as regards everything French are again prominent.

THE last number of the Hellenic Society's *Journal* contains a description of the remains of the theatre at Megalopolis now being explored by the members of the British School at Athens, accompanied by a plan and section of the portions laid bare. This discovery seems to dispose entirely of Dr. Dörpfeld's theory that the Greek theatres had no raised stage, that the characters impersonated moved and acted on the orchestra level, and that the stage wall was only for the purpose of a decorative background; a rather curious instance of the occasionally fanciful tendencies of this learned but rather too imaginative archæologist. Considering the part taken by the chorus as a commentator on the action, it seems in itself absurd to suppose that the actors should be grouped on the same area and within the same precinct as the chorus, and in such a manner as to be permanently localised with them; not to speak of Vitruvius's distinct statement that with the Greeks "the tragic and comic performers act upon the scene, the rest going through their parts in the orchestra."* The section of the Megalopolis theatre shows a portion of the Greek stage *in situ*, the front being formed into steps, so that the imagined decorative wall did not exist at all, in this case at all events. It may be said that one example does not go for much; but where a theory is so improbable in itself, a decisive instance to the contrary counts for a good deal. The front wall stylobate of the Roman stage, projected subsequently in front of the Greek one, is also shown. The members who sign the article (Messrs. E. Gardner, Loring, Richards, and Woodhouse) observe that if the stage could be proved to be of the second or third century B.C., "the new theory might still be held in a modified form, *i.e.*, with reference not to the later Greek theatre, but to that of the fourth and fifth centuries," and that the question of date will be fully considered hereafter; but we rather doubt whether they themselves are very serious in this half-concession.

MR. CECIL SMITH contributes to the before-mentioned number of the Hellenic Society's *Journal* an interesting paper on an important hydria in the British Museum, with a representation, we believe unique, of an Orphic myth, the rending and eating of the body of the infant Zagreus by a Titan. We are glad to note, in conclusion, a paper by Canon Hicks on "The Collection of Ancient Marbles at Leeds." It has always remained as somewhat of a slur on English archæology that the great work on the ancient marbles of England should have been produced by a German,—Professor Michaelis,—but it still remains for English scholars to fill up the lacunæ of this book. The Leeds collection had wholly escaped the notice of Professor Michaelis. The collection consists chiefly of marbles collected in 1815 by Mr. Benjamin Gott during a tour among the Greek islands and at Smyrna and Athens, and presented in 1863-4 to the Museum of the Leeds Philosophical Society by the Rev. John Gott, then Vicar of Leeds and Dean of Worcester.

MR. JUSTICE CHITTY recently tried three cases arising out of a claim in respect of certain rights of light as against the lessee of the site of the old Bankruptcy Court, in Basinghall-street. The Court stood upon the site of the eastern part of Bakewell Hall, which lay southwards of the Guildhall Chapel. In 30 Richard II., the Corporation established a weekly market for woollen cloth in a house which they bought, and had been the inn or town mansion of the Basing family, and which had been occupied *temp:* Edward III. by one Thomas Bakewell, or Blackwell, soldier, citizen, and merchant taylor. The property included two gardens, one messuage, and two shops, in St. Michael and St. Lawrence parishes, and cost 50*l.* It was decreed that no foreigner or stranger should sell any woollen cloth excepting after deposit in the Bakewell Hall, upon pain of forfeiture. King Edward VI. gave some of the tolls, or hallage, to Christ Hospital, whereof the governors were masters of the warehouse. Rebuilt in or about 1588, for 2,500*l.*, and burnt in the Fire, Bakewell Hall was again rebuilt in or about 1672. Numerous views by Schnebbelie and Lacy, and J. C. Buckler, of the third hall are preserved in the Guildhall Library. According to Bloome's map, 1755, it had a frontage, southwards, along King-street-court. Allen, in his "History of London," 1828, tells us that the Hall had three spacious entrances from Guidhall-yard, Basinghall-street, and Cateaton (Gresham) street. The Bankruptcy Court erected upon its site, 1821, was designed by William Fowler, architect of, *inter alia*, Covent Garden Market-house, and old Hungerford Market. New buildings are now in course of erection over the Grange-court site, next south of King's College Hospital, Clare Market.* For that site of 6,200 square feet, the freehold property of Brasenose College, Oxford, a sum of 28,000*l.* was originally claimed. But an assessment of 16,500*l.* was ultimately agreed upon, together with an award of 1,608*l.* to another party for her interest in the "Lord Nelson" tavern, Clement's Inn passage, and the freehold of a house in Clement's-lane.

FOR a long time past a tap which would not wear out and need frequent replacing of its washers of rubber leather or other material has been a desideratum, and a first-rate maker assured us not long since that there was no screw-down tap which could be trusted to last more than a year. The difficulty promises to be solved not by a manufacturer but by a great physicist, Sir William Thomson, who has contrived a plan for keeping a tap watertight with metal working on metal. A section of one form of this



tap is appended. The difficulty of metal upon metal of course is that of keeping the surfaces perfectly true to each other, and preventing the incursion of minute particles of dust or dirt between them which would be sufficient to prevent two hard surfaces from coming into watertight contact. The principle of Sir William Thomson's screw-tap lies in making the two metal surfaces grind each other smooth in the ordinary course of their working.

"The metal valve A on reaching the seat B, also of metal, is not suddenly arrested, and compelled to seat itself haphazard, but continues to turn upon its seat as the handle is turned, receiving meanwhile a gradually increasing pressure from the spring C, centrally applied through the medium of the rounded head of the stop D. The valve is thus rubbed upon its seat at every opening and closing, and both valve and seat thereby acquire and maintain a perfect fit and burnish. No packing is used to prevent upward leakage. All water which passes the screw when the tap is open enters the annular space E, and is drawn off into the bib through the eduction tube F, in which a current is induced by the velocity of the water flowing through the bib."

We are not quite so sure that there would not be a slight drip in some instances just after use, in spite of this last provision; but that is not a matter of much consequence; the main point is that we have here a tap which will remain watertight without the intervention of perishable compressible material.† Architects may note that this is

* "Ideo quod apud eos tragici et comici actores in scena peragunt, reliqui autem suas per orchestram præstant actiones; itaque ex eo scenici et thymelici græce separatim nominantur."—Vitruvius: Lib. V.; cap. 8.

* See the *Builder*, March 19 and June 25, 1887.

† The tap is manufactured by the Palatine Engineering Company, Liverpool.

the same principle on which the Greeks secured the absolute fitting of the beds of the drums of their marble columns, by revolving one surface on the other.

In a "Note" on October 4 last, we adverted to the project for commemorating, on the 2nd inst., the hundredth anniversary of John Wesley's death. We hear that Mr. E. Hoole, architect, is engaged to superintend the restoration of the chapel built by Wesley, in City-road, the foundations of which have already been made secure, and that the new works will be begun next week. The bronze statue of Wesley will be made by Mr. John Adams-Acton, sculptor of the medallion tablet, to Wesley, which, in 1876, was set up in the south aisle of the choir at West Minster. For that profile, as well as the full-sized model (for the statue) which was unveiled last Monday, it is stated that a likeness by Ridley, from a cast of the face, was used.

Under the heading "The Drainage of Overstrand," the *Lancet* publishes the following pointed commentary:—

"A good deal of discussion has been going on concerning the need of a scheme of drainage for Overstrand, which is becoming a bathing resort on our eastern coast; and in the end it has been decided that the cesspool system is for the present to be retained, on the understanding that 'the cesspools shall be properly looked after.' What this means it is difficult to say, for, unless the cesspools are watertight and periodically emptied, it is perfectly obvious that their contents must soak into the surrounding soil,—a condition of things that is hardly calculated to attract those who seek recreation and health. The decision seems to have been come to because of some doubt as to whether the flow of the tide would not bring back the sewage from the proposed outfall to the spot where bathing is resorted to. It is by no means clear that this would have been so, but it ought to be possible to devise a scheme which should be free from any such risk."

When it is added that the whole of the drinking-water at Overstrand is drawn from wells sunk here, there, and everywhere, it will be recognised that the suitability of this place for a "health" resort must remain more than doubtful until a more scientific and sanitary course of treatment is pursued in dealing with the drainage.

The ninth annual exhibition of the Society of Painter-etchers, is now open at the Gallery of the Society of Painters in Water-colours. The feature of the exhibition is the collection of impressions of all the plates of the Liber Studiorum which were etched by Turner himself. We have here in many cases not only the mezzotint in which the plate was finally carried out, but the line etching which preceded this stage of the work; and it is extremely interesting to compare this scaffolding with the finished effect. There are also several examples of Turner's repeated work and alterations on the same plate, prints of the various phases being hung side by side. There are appended besides six small plates from a series which were found in Turner's house after his death, some finished and some unfinished, almost entirely in mezzotint; none of which have ever been published. Two of these, "Moonlight at Sea" (360) and "Boston Tower" (362) are very beautiful, the latter especially. The rest of the collection includes much admirable work, though, as usual, with many different types of treatment and effect included under the general term "etching." Mr. Farrer's "Moon Rising after a Hot Day" (185), for instance, is called dry-point, but the effect seems to a great extent to be obtained by what we should venture to call smudging. We have a preference for pure line etching, and in this kind of work such artists as Mr. Short and Mr. D. Y. Cameron leave little to be desired. The former has one most remarkable little etching, "Entrance to the Mersey" (93), which at first glance seems a mere skeleton of a picture, but on examination it shows an effect of distance, air, and expanse of flat shore and water, which is wonderfully conveyed in so few lines. Among Mr. Cameron's may be named "Tweedmouth" (54) "Berwick" (131), "The Docks, Greenock" (164), and "The Tay" (242), the last perhaps the best. Mr. Strang's human deformities, not without a certain power, are a kind of nightmare art which we would rather see banished from the walls; there is pathos and power of action, however, in his "Hedger" (220) which reflects the spirit of Millet, and his portrait (6—of the artist, we believe) is a fine powerful piece of work in the head, but the hand is very badly delineated. Among more finished or pictorial etchings may be mentioned Mr. Slocombe's "Byfield" (10) and "Mechlin Cathedral" (66), and two or three works by Mr. Haig, of which the most important is "In the Arab Quarters, Cairo" (154), and the most pleasing is a small one, "In Rhineland" (180). Among other small works which represent the true poetry of etching are "Brighton Sands" (5), by Mr. R. Goff; and "An Old Pier" (103) by Mr. Short. The exhibition shows work for nearly all tastes, and much more that is worth attention than we have space to mention.

The Royal Scottish Society of Painters in Water-Colours are holding an exhibition of the works of their members in London this year, at Messrs. Dowdeswell's galleries. The tendency of the exhibition is towards a broad method of treating effects with little regard to detail. There are some drawings of this class marked by much power and freedom of style, such as Mr. A. MacBride's "When Trees put on their Mantles Brown" (6) and the same painter's "A Summer Sea" (57), with the reservation that the sea is not very watery-looking. The same criticism may be made against the pond in Mr. S. Reid's "Pond Lilies" (18), otherwise a fine drawing. There is sometimes a reminiscence of other artists than those whose names are appended to the drawings; thus Mr. Calvert's "Edge of the Wood" (14) is only J. W. North with the sunlight turned off; Mr. Wellwood Rattray's "Summer Sunshine" (52) suggests Mr. David Murray, and Miss Cristina P. Ross's "Painter's Studio" (136) looks like a reminiscence of Cattermole. Mr. Thomas Scott's large landscape "A Check" (96) is exceedingly fine if a little imaginative in colour; the foreground shadow under the trees seems too dark for the scale of light in the rest of the picture. Mr. Laing, in "The Afterglow on the Nile" and "Eastern Moonlight" (150) gives us subtle studies of colour. Mr. Nisbet's "Sunset on a Border Moor" (70), and Mr. Mactaggart's "Bathers" (16) are fine and suggestive drawings; and there is poetry in Mr. Colin B. Phillips's "Strath Avon" (58), Mr. Donovan Adams's "Just before Sundown" (103) Mr. Paterson's "The Mill" (152) and Mr. G. G. Smith's "Garden Reverie" (153), and even, to a certain extent, in Mr. Brownlie's smudgy painting of desolate and dirty scenes of various kinds (51, 135, 200, &c.). Mr. R. W. Allan and Mr. D. Murray seem to keep their best things for the exhibitions of the Southron. Mr. Melville makes an attempt to paint "Henley" (35) on the night after the last day of the racing —nothing but Chinese lanterns. We regret to say that about the worst drawing in the room is an architectural subject, supposed to represent the west front of Westminster Abbey (85). The proportion of the front is ludicrously wrong, and looks like a caricature of the building. It is curious how difficult it seems to be for painters to see architecture correctly.

Architects' Benevolent Society.—The annual general meeting of the subscribers and donors of this Society will be held at 9, Conduit-street, on Wednesday next, March 11. The President, Mr. Waterhouse, R.A., will take the chair at five o'clock.

British Institution Scholarships. — These scholarships are of the value of 50*l.*, and are tenable for two years. This year three scholarships are offered in painting, one in sculpture, one in designing in black and white, one in engraving, and one in architecture. The examination will take place in July. Application for further information should be made to 19, York-buildings, Adelphi.

LETTER FROM PARIS.

Far be it from us to bring political matters into these letters, but the recent clamour in the French press as to the participation of our artists in the Berlin Exhibition can hardly be passed over in silence, though the incident which has given rise to all this excitement is not in itself of very grave importance, and might have passed over with little notice but for the ill-judged interference of certain journals, which has given it a factitious importance.

There seemed nothing at the outset that need arouse the susceptibility of the Parisian population. It was known that the Berlin Society of Artists had organised an exhibition for this year in honour of the fiftieth year of their foundation, under the patronage of the Empress Frederick; and no one in the first instance thought of protesting against an invitation to French artists to take part in it. The nomination of a French jury was even announced, and the visit of M. Detaille to Berlin to assist in the arrangements for this portion of the exhibition. It was only regarded as an important opportunity for the display of French art, which the government was desirous to assist and encourage. The ardour of a polemical press, to be regretted on every ground, has from day to day thrust the real question on one side in order to revive the unhappy recollections of the "Année terrible." The too-famous "Ligue des Patriots" has come to the front, the Boulangists have organised meetings, and under this kind of pressure public opinion has suddenly turned round and displayed such a hostile attitude that even those who were among the first to send in their adhesion have felt obliged to draw back; and M. Detaille, after maintaining that "l'Art n'a pas de patrie," has announced through the papers that he much regrets that personal considerations prevent him from taking part in the Berlin exhibition. In the presence of this retrograde movement it may be presumed that French art will not be represented at Berlin.

In such a case protestations are useless, even though we know that much of the high-sounding language used means little enough in reality. We merely recall here the fact that last year the official delegates of the Republic visited Berlin to study the social questions formulated by the Emperor of Germany, without arousing any Parisian denunciation. A few months ago French *savants* were studying the discoveries of Dr. Koch; very recently the "Lohengrin" of Wagner was performed with applause in an important French city; when that exceedingly German painter, Herr Uhde, was decorated by the French Government with an order of the Legion of Honour, no one cried "treason"; and we even received with equanimity the expression of sympathy sent by William II. to the Institut on the death of Meissonier. It is truly vexatious that this spirit of eclecticism has not been carried out consistently. The true "patriotism" would have consisted in seizing on this opportunity to give the best representation of the artistic genius of France, and to prove that her disasters and trials had in no way weakened or altered the supremacy of her artistic power.

It cannot be denied, however, that for some time past there has been a tendency in France to mix up political questions with art in a rather strange fashion. Thus, very recently, a Legitimist senator indignantly denounced the statue of Marat erected in the Parc de Montsouris. Marat was certainly a very sinister figure of the Revolution, and it would hardly enter into the head of our present Government to set up his memory for public homage. But this was an original and striking (though rather too realistic) work of the sculptor, M. Baffier, bought by the Municipality in 1883, and set up in a public place just as its other annual Salon purchases have been. One single member of Parliament professed to see in this fact a spirit of sympathy with the period of the "Terror," and got up such a feeling about it that the statue was taken down and relegated to the Museum at Auteuil. Then there was another and opposite cry got up, and the Government was bitterly reproached with having favoured the reactionary party and repudiated the "grandes figures de la Révolution."* The

* We cannot say that we quite follow our esteemed correspondent here. The setting up of a portrait-statue in a public place is certainly generally supposed to convey the idea that it is an act of honour to the memory of the personage represented; and the accusation made against the Government for consenting to remove the work seems to indicate that it was so regarded, at all events in some quarters.—Ed.

dispute might be still going on, had not the matter of the Berlin exhibition effaced it for the time.

There is in the Square Monge a statue of François Villon, purchased, on account of its high artistic merit, from the sculptor Etcheto, who died two years ago. This is a fine work and an imaginative one also, since Villon died in 1484 and there is no existing portrait of him. But this poet, according to all tradition, was little better than a highway robber and narrowly escaped the gallows. It is to be feared now that some moral member of the Senate will accuse the Paris municipality of having wished thus to do honour to a gallows-bird. We shall have in future to be very circumspect in our choice of statues for public places.

The "Union des Femmes Peintres et Sculpteurs" opened its tenth exhibition a few days ago at the Palais de l'Industrie. This small annual salon seems to have come under the influence of the recent artistic feud, for it is announced that Madame Elisa Bloch, a well-known sculptor and generally spoken of as the founder of the "Union," has sent in her resignation, and that a certain number of other members are intending to follow her example. However tempting the example of the Salon National may be, it is to be wished that the lady artists should have the good taste to remain at unity among themselves, and not afford the public the spectacle of their differences and rivalries. "L'union fait la force," and the lady artists have every need to unite their efforts if they are to retain the attention of the public, who like fewer pictures and higher talent in these exhibitions. The works admitted occupy, this year, five rooms. If this rate of increase continues, the whole of the rooms will be filled in a few years. Now there is talent, correctness, and intelligence in many of these works, but little of the higher sentiment of art. Most of the exhibitors are good pupils who copy their masters with a fidelity more flattering to the latter than to themselves. Among the works exhibited, however, may be mentioned as worthy of attention those of Mdme. Demont-Breton, Mdme. Lavieille-Goussaincourt, Mdme. Vallet, and a fine water-colour view of Rome by Mdme. Hélène Buron. Among the works in sculpture, not numerous (and from which we regret that the name of Mdme. Léon Bertaux is absent), we need only mention a bust in marble by Mdme. Laure Marie Coutant, and a pretty sketch by Mdme. Clovis Hugues.

The exhibition of the Water-colour Society is more unassuming and less crowded. It contains works of great interest and originality. In the first rank are M. Detaille's "Artillerie de la Garde," the drawings of MM. Besnard, Harpignies, and Zuber, and the sunny landscape subjects of MM. Adan and Yon. There are also to be remarked a church interior by M. Morand, various scenes by M. Gilbert, sea-pieces by M. Courant, and lastly the free and vigorous composition by M. Toché. M. Vibert, whether as an oil or water-colour artist, ends by fatiguing us with his constant repetition of the same class of subjects, always hard, correct, and finished, and destitute of feeling. M. Worms has also re-edited once more his conventional Spanish scenes which everyone knows by heart.

With the exhibition of the "Mirlitons" club we conclude the notice of small exhibitions of the month. This exhibition has never been so successful as this year, and among the 178 pictures and 34 sculptures contained in it are a very large proportion of works of the first order. M. Detaille is in front again here, with his "Charge de 4e Hussards," which is the leading attraction. We may notice also the fine portraits exhibited by MM. Aublet, Bonnat, Chartran, Cormon, François Flameng, and Jean Gigoux, an "Intérieur d'Atelier" by M. Gérôme, a poetic work by M. Albert Maignan, and two fine pictures by M. Besnard.

The regulations of the Société des Artistes Français for the Salon exhibition have undergone some useful modifications, which have been accepted by the "Committee of Ninety." The jury will be selected on a more equitable principle. The one-franc admission is to commence at ten instead of twelve in the day. On ordinary days there will be a two-franc admission from eight to ten in the morning. The free entrance after noon on Sundays is to be continued. Pictures for exhibition are to be sent in from March 15 to 20, and drawings from the 12th to the 15th. The number of pictures is to be limited to 1,800. The new regulations preclude no one from exhibiting, while the Champ de Mars Salon forbids any entrance to exhibitors who are not members. The Palais d'Industrie Salon will not only admit members of the rival Society to exhibit, but even to be elected on the jury. It is intended to extend the artists' varnishing day to the whole week preceding the opening of the Exhibition, when they will be much better able to attend to their pictures than among the crowd which attends on the nominal "varnishing day."

In order to lose no means of combatting the attractions of the rival Salon, the direction of the old Salon had determined also to improve the arrangement of its rooms. It was intended to set apart one room as a "Salon d'Honneur," to decorate all the rooms with a frieze executed by some artist of eminence, and to lower the awnings of the ceilings so that the paintings may bear a larger proportion to the size of the rooms. But these schemes have had to be abandoned, and the Salon will be much as it was last year. A certain number of the rooms will be divided, to break the monotony of so many rooms of the same size and proportion. There will probably be seen in the next Salon a certain number of the works intended for the decoration of the Hôtel de Ville, including a large and striking work by M. Jean Paul Laurens, "Bailly receiving Louis XVI. at the Hôtel de Ville."

The Champ de Mars Salon will open, as last year, on May 15, and remain open to July 10, in the Palais des Beaux-Arts. Painters and engravers have to send in their works from April 1 to 5, sculptors from the 15th to the 20th. The entrance is fixed at 2 francs in the morning and 1 franc in the afternoon, and a half-franc on Sunday afternoons.

Some admirers of Carpeaux have proposed to reserve a gallery at the Salon National for a special collection of his works. But the committee considered that the exhibition would be rich enough in contemporary work without adding a posthumous exhibition of sculpture, and the proposal has been abandoned. But there is another excellent innovation proposed. This year, decorative art of every kind,—gold and silver work, jewellery, bronzes, silks, ceramique ware,—may be admitted into the exhibition, under the reservation that they are to be exhibited by the artists themselves, and not by manufacturers or dealers. This is a very important decision, which promises to give a special interest to the exhibition.

At the Louvre several improvements have been introduced, the most important of which consists in the publication of short accounts, fixed up in the rooms, of the history of each gallery and all information in regard to its decoration. This system has been commenced in the Galerie d'Apollon, and is to be extended to all the other portions of the museum.

The Luxembourg Museum, which has hitherto contained only painting and sculpture and a few drawings, has just received a fine collection of medals engraved by M. Chaplain and M. Roty; an important addition to its collections.

M. Falguière has just finished his model for the important work commissioned from him for the decoration of the Panthéon, and which is as already stated, a commemorative monument of the French Revolution. The Committee for the Decoration of the Panthéon has received it with something more than satisfaction. The design may be described thus: On an altar "de la Patrie" decorated with flowers are three tall statues symbolising Liberty, Equality, and Fraternity; above them floats the drapery of a standard. Two other couples of statues flank the altar. On the right is Law, a seated figure supporting on her knees a tablet on which she writes the Code, by her side is Fame ready to take flight. On the left, a combatant protects with his sword a female figure stretched on the steps, and who raises her hands towards the figure of Liberty. This monument, the decorative effect of which is very fine, will be placed at the back of the nave, on the main axis of the church.

M. Mercié is to be entrusted with the monument to Meissonier, which is taken in hand by a committee presided over by the Duc d'Aumale. This monument will probably be placed between the Pavillon Flore and the Pavillon Marsan, near the Arc du Carrousel on the Tuileries site. It may be mentioned that, contrary to what has been announced, there is no intention of selling the works which Meissonier left in his studio. In conformity with his known wish, his heirs are disposed to give to the Louvre the "Attente" and the "Graveur à l'eau-forte," two of his best works which he had always refused to part with.

Some time before his death Meissonier had himself designed the model for a gold tablet which the well-known goldsmiths, MM. Bapst and Falize, have executed under his direction, and which forms the cover of a book which the presidents of the various juries wished to offer to the President of the Republic as a souvenir of the Exhibition of 1889. Thus the last work of the great French painter of our era will become the property of M. Carnot.

At the École des Beaux-Arts the Jury of Architecture has decided several competitions; among them one consisting of a design for a Hotel, in which, from among 63 competitors, the jury decreed a first medal to M. Duquesne, pupil of M. Pascal.

Two architects of high standing have died during the past month, Albert Lenoir and Joseph Uchard, whose death has been already announced in the *Builder*. Lenoir, who had been a pupil of Debret, was one of the founders of the Société Centrale. He was both a learned architect and an archæologist of the first order, and a man who was universally esteemed in his personal character. Uchard was also a man of unusual ability in his profession. He obtained in 1838 the Grand Prix de Rome. He leaves numerous works behind him, and will always be remembered for his zealous co-operation in the work of the Société Centrale, of which he was successively Secretary, "Censeur," and Vice-President.

BYZANTINE ARCHITECTURE.*

BY PROFESSOR AITCHISON.

Byzantine Construction.

WE should think that a contemporary, and probably an eye-witness, of the colossal works of Sta. Sophia would have given us some interesting particulars of the methods employed in building it, of the scaffolding and centering used, and the means of raising the materials, more particularly when there were huge stones to be lifted; but Procopius' eye was single, his sole object was to glorify Justinian, and though we might hope he got his reward, it is to be feared he did not, or he would hardly have published his book of scandalous anecdotes of the Court, and of his first master, Belisarius. As we can get almost nothing from him, we can only hazard a conjecture as to the presence or absence of centering for the original flat dome and for the present one, and all the other particulars we can get are from the existing works. The knowledge that Paul the Silentiary had is put into a poetic form, and this form is not likely to deal with such matters as building, except in so vague a way that it can be but of little use to mere prosaic constructors, and besides its being a poem, it is in Greek. What Salzenberg got to know of the construction of Sta. Sophia is locked up in German, so that anyone treating of Byzantine construction would be either forced to deal in generalities, or to omit everything that could not be gathered from published drawings, or an examination of buildings as they now stand. Fortunately, however, we have a genius amongst us, who, after having laid open to all eyes the economical construction of the Romans, has bestowed his time and talents on making Byzantine construction equally clear. I, of course, mean M. Auguste Choisy, of Paris, the Engineer-in-Chief of Roads and Bridges. His professional avocations made him anxious to interrogate the past, and to see if the methods formerly employed could not aid him in the present; being a man of genius, he said to himself, Why should I first build a wooden bridge to build a stone one, and then throw the wooden one away? Did the Romans do so? After examining the illustrations of Roman work and pondering on the subject, he sought in the works themselves and in the methods now employed in Italy the answer to his questions, and found the answer to a riddle that had completely posed mankind ever since Roman methods were generally abandoned; for the tile skin of vaults is still practised. Having his observation and his judgment sharpened by his first successful attempt, he sought and solved the more difficult problem of Byzantine construction, and in 1883 he gave to the world his

* Being the Sixth and last Royal Academy Lecture on Architecture this season. Delivered on Thursday evening, February 12, 1891. (For the First, Second, Third, Fourth, and Fifth Lectures, see pp. 82, 103, 123, 144, and 164, *ante*.)

second great work on "The Art of Building among the Byzantines."

It is on this work I must mainly rely for giving you the following descriptions. M. Choisy draws the line of the influence of Roman construction at the Adriatic, and considers that as to the west of it the methods pursued were Roman, so to the east of it all the methods were Greek, modified, of course, by the influences of Asia.

"Persicos odi, puer, apparatus" ("Persia's pomp, my boy, I hate"), tells us that in Horace's time the Romans were not unacquainted with Persian habits, and we may, I think, point to Persian domes as the models from which the Pantheon was imitated, though it is, of course, possible that domes of large dimensions were used at an early period in Asia Minor, which successive invasions may have destroyed, not to speak of the destruction wrought by the savage Tamerlane and his Tartar hordes. The emperors of the lower Empire were constantly at war with the Persians for the possession of Mesopotamia and Armenia, and the Byzantines must consequently have been even more familiar with Persian methods than the Romans. M. Choisy came to the conclusion that as the Romans had found a cheap method of vaulting by first covering a light centre with a network of brick, and then filling this with horizontal rubble work, so the Byzantines had turned their vaults without any centering at all. He says:—"Analyse a Roman vault of Western construction, you will scarcely find in it anything but a little framework of brick, which is its bony structure, its skeleton; the rest is only a structureless backing, a filling of pebbles and of mortar, a concretion pure and simple: one of those wisely primitive works from which intelligent labour is purposely excluded, and which shows an immense material force, the passive instrument of a powerful will. In the East, on the contrary, in the Grecian countries, all is combination, all is calculation; each fragment has its office, and its appointed place, in the vault of which it makes a part; besides the ruling idea which conceives, the adjusting force which executes, is seen throughout: one feels transported into an entirely different surrounding; and the monuments of the two schools thus betray, even to their smallest details, the difference of the hands they have come from. I try to see a point of contact, a community of thought and of tendency, between these two schools, and the only common tendency that I can seize on is this: on either side they wish to be freed from the subjection of helping works, and of temporary aids. Is this a result of imitation, or the effect of traditional influence, in the two schools? For my part, I incline to see in this search for economy one of those chance meetings which good practical sense would bring about without any exchange of ideas. Whichever it may be, the analogy is only found in the principle; directly one comes to the details of applying it the differences reappear, and the two schools separate from one another.

At Rome, where the vault is a monolith made from a plastic material, the solid mass which forms it requires a mould, and the Roman architect gives in effect to each vault its centering. But he is loath to build this centering merely to destroy it afterwards; and with this thought he applies a mixed construction, half brick and half timber. The vault is finished, the timber part alone disappears; all the brickwork remains embedded in the mass, and associates itself with its resistance; to embody in the vault the greater part of the mould which has carried it, is, in short, the Western method. Amongst the Easterns the notion of saving takes a more positive form; the question for them is not to lessen the expense of the helping works, but to omit them. The Greek architects frankly proposed to themselves the problem of vaulting without centering, and, thanks to the ingenious disposition of the materials, they were enabled to solve it. They raised the greater part of their vaults by building them in the air, without support, without a resting-place of any kind; their method is not a variation of that of the West,—it is a system altogether different, and one not even derived from any Roman source." (A. Choisy "L'Art de Bâtir Chez les Byzantines," Introduction, 4to. Paris, 1883.)

Having now explained the ruling idea, I will treat of each particular part of the structure.

Byzantine walls mostly have the stones of the rubble larger than in Roman work, and this rubble work was never rammed. Instead of the one course of bricks about every 5 ft., they used from three to five courses of brick about every 10 ft. in height, and in fortification about every 5 ft. Byzantine bricks are said to be generally larger and better burnt than the Roman ones, and the mortar-joint is rarely less in thickness than the brick, and often thicker. At Blachernæ the mortar is about two-thirds of the whole material. To make this mortar properly resistent, broken tiles that would pass through a $\frac{9}{16}$ in. mesh were mixed in it. This mortar is called by Vitruvius Opus signinum, and was used as a hydraulic cement, and partly as a material to resist heat. It is still used throughout Macedonia, and is now called "Khorassan" work. The Byzantines preferred their lime made from marble, but used limestone when marble was difficult to get or too expensive to use, and, from the present Eastern practice of keeping slaked lime for year in huge pits, it seems probable that it is a continuance of the old Roman custom.

As I mentioned in speaking of the churches at Athens, the walls faced with stone have generally one or more courses of brick between the stone courses, with very thick mortar-joints; this gave more soft matter to squeeze than if the stone facing had been laid with thin joints, and there was consequently less danger of separation between the facing and the rubble backing; the bricks, too, generally project beyond the stone, and act as bonders to the rubble. 1. Byzantine columns were marble monoliths, mostly used against the bed, with square, squat caps, bevelled off at the bottom into the circle. If the pier supported was a parallelogram, the thick abacus was generally a separate stone, and was but slightly bevelled at the sides, and deeply at the ends. Bronze rings, sometimes with fringes, are frequently added above the base and below the necking of columns, to prevent scaling or splitting; many cases of their use may be seen in Sta. Sophia. When columns were required of such a height as to render the use of monoliths impossible, as in the case of the cistern of Philoxenus, there was a circular piece of stone or marble *on its bed*, much larger in diameter than the columns, between each shaft, on which the upper column stood, while the lower one was sunk into it; this acted as a restraining ring,—at any rate, to the lower shafts. Both metal and marble rings are found at the junctions of the slender shafts surrounding piers in Gothic work. Sheet-lead was inserted by the Byzantines between the junctions of columns with their caps and bases.

There is no time in a lecture to give every example of the ingenuity displayed in economising centering, when centering had to be used; but, I may say roughly, that it was done, in the case of stone vaults, by building them in unbonded sections, so that the set of centres used for the first section could be used for each succeeding one. We shall see hereafter that this principle of unbonded sections was carried out in brick vaults where no centering was used. The baths of Diana, at Nimes, which is Roman work, is vaulted by means of ribs and panels; the stones forming the panels are laid into the rabbets of the ribs, and require no centering. The temple of Diana, close by, is vaulted in much the same way, so that one rib centre is all that is required for the whole building. Arches are often made by using square voussoirs, with the taper in the mortar-joint (lithograph, fig. 1); and, as often as not, they are built with a course or two of brick between the stone cubes.

We, who build brick barrel vaults on centering, make each course parallel with the side walls, and each brick, being placed on the centering, naturally falls into a normal to the curve; if we were to try and build such vaults without a centre, when we got up to the angle of slipping we should be at a loss to know what to do, unless the cement were strong and quick-setting, and the springing were sufficiently thick or tied down, to prevent the sides from toppling over.

The Byzantines hit on a novel expedient; they built their vaults in slices the other way, *i.e.*, they stuck the bricks against the heading wall or arch, where they were kept by the adhesion of the mortar, till the arch was keyed, and then another slice or arch could be built against the first; there being no bond, the mortar alone secured the adhesion of each ring to the next (lithograph, figs. 1, 1A, 1B, 1C, 1D). There was, however, the same difficulty that there is in standing up books vertically, the least touch will overset them, and we therefore put them at an angle, with the top touching the wall. The Byzantines built out a skewback on the heading wall or vault (lithograph, figs. 2, 2A, 2B), so that besides the adhesion of the mortar the position made the bricks less liable to fall, only from the bricks being laid sloping, the soffit of the arch was not flat, but like the teeth of a saw (lithograph, fig. 3); this, however, made a better key for plastering or mosaic.

The Byzantines eventually brought out the ends of the springing so as to form a curve on plan (figs. 2, 2A, 2B, 3, 4, 4A). This scheme seems to have been adopted in the aisles of Sta. Sophia at Salonica. Sometimes this scheme was only partially used; the springing courses were built in the ordinary way, parallel to the side-walls, up to the slipping-point, and the remainder was then vaulted over in sections at right-angles as before. At Hadrian's aqueduct at Constantinople a brick vault has been built up to support the stone one that was giving way, and the builders managed to keep up the springing, until the two sides were within the length of a brick apart (some 2 ft., I should guess), and they then wedged bricks in at right-angles.

If a barrel vault was built from one end only, when the work got nearly to the other end, they wedged in bricks at right-angles to the face of the rings; when it was begun at both ends, the middle was filled in by putting alternate slices against the springing and

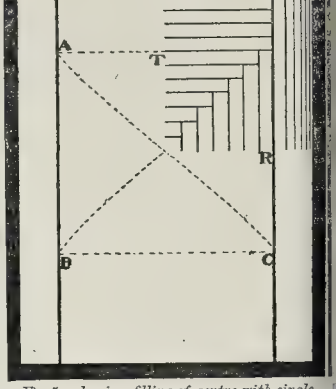


Fig. 5: showing filling of centre with single straight alternate courses.

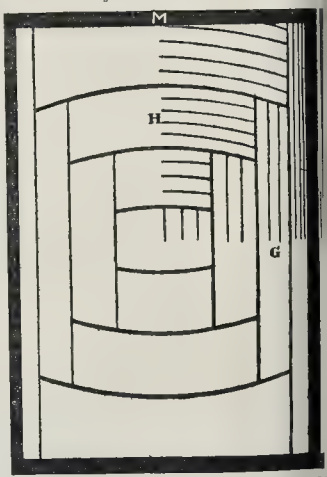
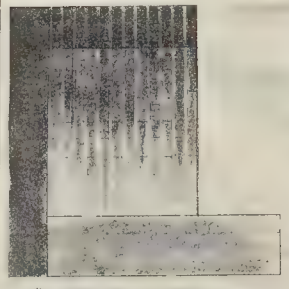
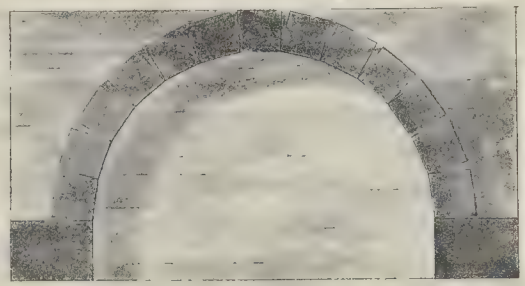


Fig. 6: showing filling of centre with straight and curved sections in alternate courses.

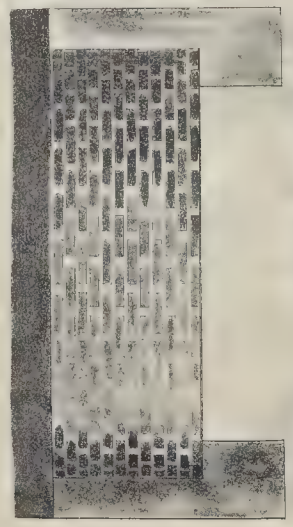
against the arches (figs. 5, 6, 6A; also 7 in lithograph), so that the ends of each course were



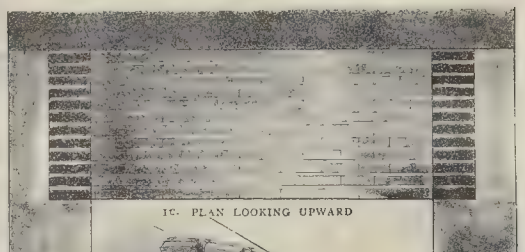
1B. LONGITUDINAL SECTION.



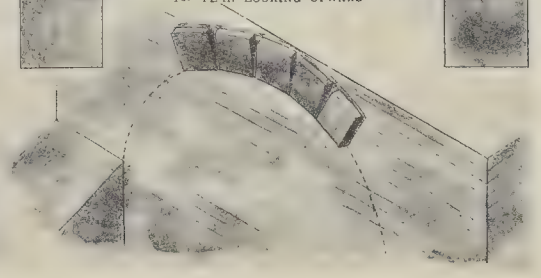
1. CROSS SECTION.



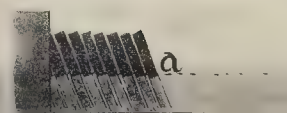
1A. PLAN OF TOP.

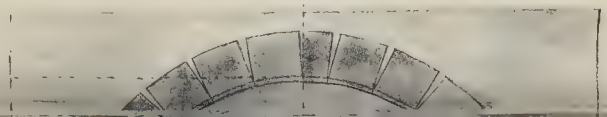


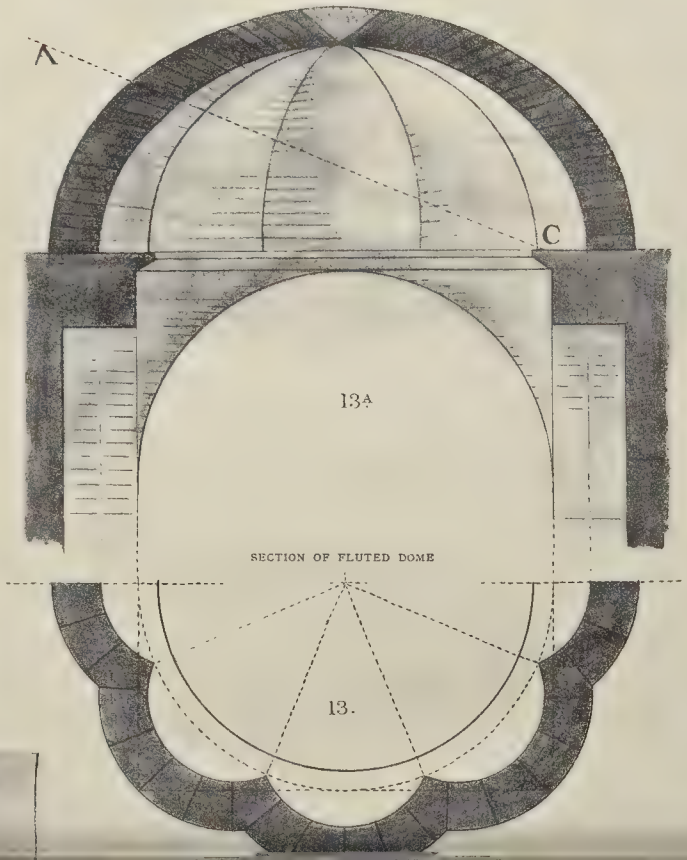
1C. PLAN LOOKING UPWARD



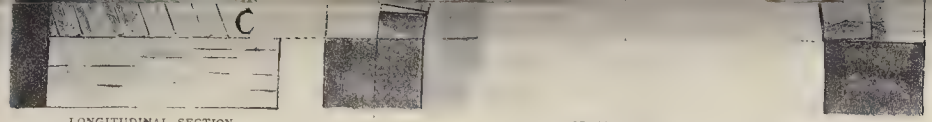
1D. VIEW OF VOUSSOIRS AGAINST HEADING WALL.





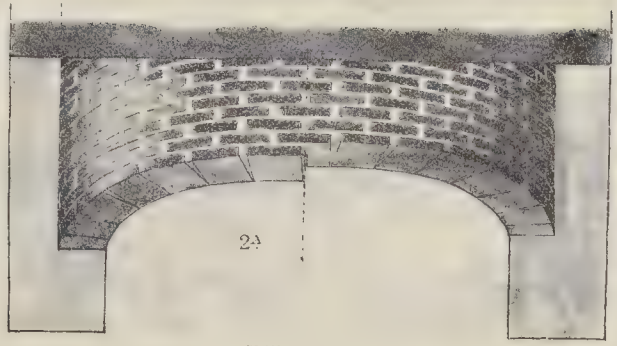


SECTION OF FLUTED DOME

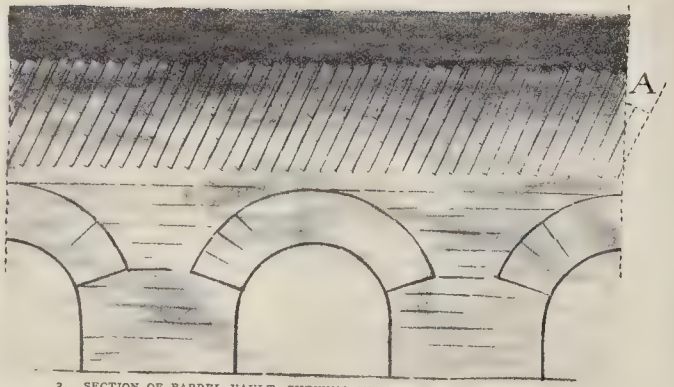


LONGITUDINAL SECTION.

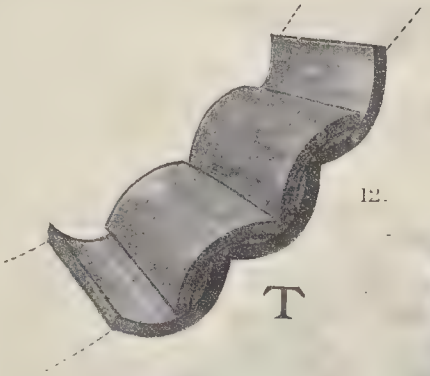
CROSS SECTION.

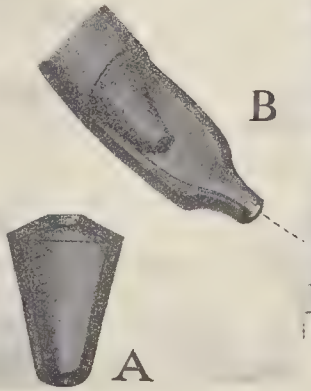


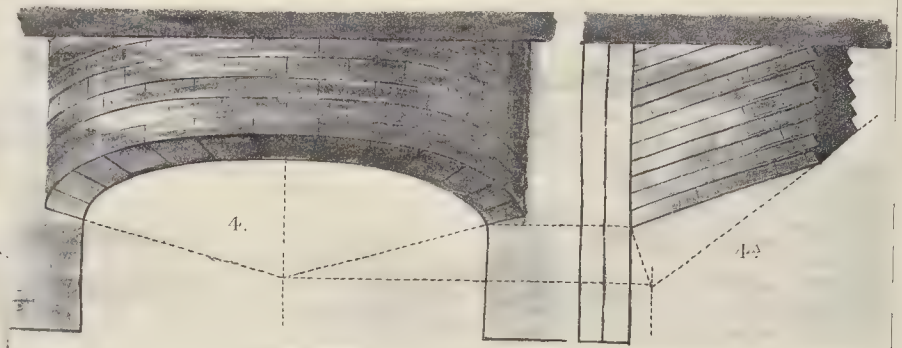
PLAN OF TOP.



3. SECTION OF BARREL VAULT, SHEWING USUAL ANGLE OF INCLINATION.







AXIS OF CONE ABOVE SPRINGING WHERE THICKNESS OF VAULT IS AT DIFFERENT ANGLE FROM THE COURSES.

BYZANTINE ARCHITECTURE:

ILLUSTRATIONS TO PROFESSOR AITCHISON'S ROYAL ACADEMY LECTURES. LECTURE VI.

butted, as may be seen in the vaults of the istern of Philoxenus, or by making these in ections of several courses, until the centre ould be filled in with the length of one brick. nother plan adopted was to build the end of ie vault on a rough sort of skeleton centre of icks, leaving a toothing inside, and conning the vault by means of toothings; this ethod was mostly employed when rough

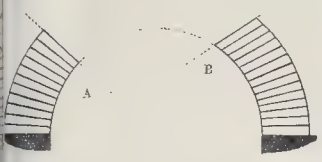


Fig. 6A: Sections of Barrel Vaults:

A, *Courses radiating from centre.*
B, *Courses of flatter pitch not radiating from centre.*

ones were used, which could not, like bricks, e held up by the mortar only, but could e secured by it when one end was wedged to the toothings. In an ordinary oined barrel vault on a square plan, the ctions through the crown on both axes are raight lines. The Byzantines not only thought at the crowns of vaults so built were too eak, but the ellipse formed by the groin points ve them too much trouble, as it did the early othic builders. Consequently they made the oin point a segment of any height less than a mi-circle, and made each panel of the vault the same section by letting the section revolve the central axis (lithograph, figs. 8, 8A). A ult of this sort has a peculiar appearance, and horizontal sections through it are made, they ke the form of quatrefoils, and if a vertical sec-on is made through the crown, the ends of the rve are rounded upwards. This peculiarity ay be seen in the aisle vaults of Sta. phia. Out of stone countries domes were stly built of brick, and the plane of e rings was not normal to the curve, but tter (lithograph, fig. 10). These planes, if pro-ced, formed an inverted cone, whose apex as much above the centre of the dome, and e cone was made flatter as it approached the own. In a few examples, when the dome had en raised to the slipping-point, it was carried by nearly parallel rings, so that above the pping-point it was almost a pure cone made the revolution of a triangle. This may be led the Arab fashion, as it was a form of dome eatly favoured by them (lithograph, fig. 11). some cases the top of the dome was made on platform and put on in a single block. M. oisy says he saw this being done in a Greek rkshop at Smyrna, to finish a dome built thout a centre: the tops of domes were some-nes formed into little domes of sharper pitch. Domes up to a certain period,—M. Choisy says the ninth century,—were made with an abut-nt at the bottom, carried up vertically, and en joined to the segmental cap by a concave rve, as at Sta. Sophia, the windows being med in the vertical part.* It was the stom, up to a certain epoch, to stiffen the ell of the dome by internal ribs, as at Sta. phia, in which there are forty ribs, with ty gussets between them. In later work s are often used as an ornament, and are n, I believe, merely bricks stuck on, but at . Sophia the ribs are bonded into the shell. ere is another form of dome of very striking pearance, *i.e.*, those that are fluted (lithograph, . 13, 13A), as that at St. Sergius and Bacchus. ese are so common in later examples as to rather the rule than the exception. This m admits of a circular dome being placed an octagon, the points of the octagon ning in the centres of the flutes. The points he flutes act, like ribs, as stiffeners.

nother method of construction for domes ch preceded Byzantine times, is found in temple at Diocletian's Palace at Spalato, ed by Adam the Temple of Jupiter, and wn at plates 33 and 34.† This method sisted of turning arches, and filling in ween the spandrels with smaller ones, then ning arches from centre to centre on the ads of the arches in the spandrels. Choisy believes that domes of this sort may be built without centering up to the slipping point. This method is correctly shown in "L'art de bâtir chez les Byzantines," woodcut 76, p. 69, and in the plate No. 14, M. Choisy having found Adam's plates incorrect. Adam being a gentleman, and not a bricklayer, never seems to have asked himself why it was done, although he drew the dome partly covered with plaster, which proves that it was a constructive and not an ornamental expedient. There is, however, a semi-dome to the vestibule of the tomb of St. Demetrius at Salonica, which, from being set out in a pattern and having ornamental bands in the arches, was evidently made to be seen. I made a rough sketch of it under difficulties. I had no candle, and could only sketch by looking at the place, and then putting it down on the other side by the light of a little window, and I was too lame with sciatica to mount a ladder and measure it, even if I could have got a ladder. I mention this, so that some of my hearers who visit Spalato and Salonica may carefully measure both.

Every architect knows that the dome of San Vitale is constructed of hollow pots, the pointed end of one, put into the open end of the other, spigot and faucet fashion (lithograph, fig. 12, A and B), a double line of these was carried round in a spiral, and made the whole construction light from the centre being hollow, and without thrust. The father of the late Professor Cockerell, used pots like these for the filling in of the spandrels of a vault he built in the Cutler-street warehouses for the East India Company. This construction of mortar with a core of hollow pottery was used for the vaults of the Chapel of St. Satyrius at Milan, and at the Baptistery at Ravenna, both of the fifth century. M. Choisy says this construction is still used in Syria, Jerusalem, and Jaffa, only there they are used to form voussoirs; the terraces over cupolas were also made of pots, this construction he found at *Μονή τῆς χώρας*. There was also another plan used: the ordinary segmental roofing tiles were laid as voussoirs, with the hollow part upwards, and over the joints others were laid the reverse way, making a chain bond of every course (lithograph, fig. 12, T); this is found at the buildings at Mt. Athos.

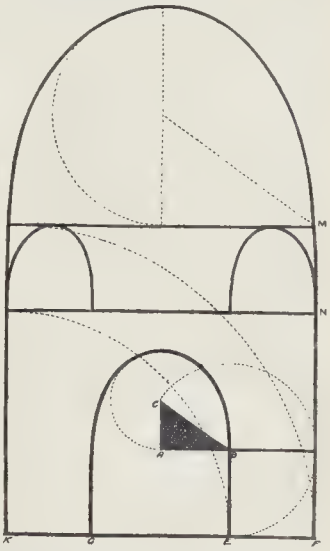
For forming niche heads in brickwork, two or more courses were adopted:—1st, the outer arch rose from a flat skewback, and the joints, though slightly convergent, did not converge to the centre; 2nd, the lower part of the niche was carried up horizontally to the slipping point, and above the courses were convergent as before. When, however, the niches were flat, they often made the joints converge to a central vertical line. This form is called by the French, "The fern-leaf pattern."

The first attempts at doming over spaces that were not circular were made by converting a square into an octagon where the pendentives are small and corbelling may be used, but an octagon was found to be almost as inconvenient as a circle, and circular domes were turned over squares by means of squinches. At St. Nicodemus and Daphne, at Athens, and in the west at Sta. Fosca, and in the domes of Parma and Piacenza instead of squinches we find conchs or shells. The various ways in which squinches and conchs are constructed are endless. The first dome with pendentives on a square plan, known to M. Choisy, is at Djerach, and in this case the pendentives and the dome itself are struck from the same centre, and the joints of the pendentives are normal to the curve; the ends of the pendentives merely abut against the arches, but where the dome proper, in stone domes, springs at the level of the crown of the pendentives, it abuts on a skewback worked on a course of stone over the arch. There is another case with a much flatter dome, at the Mosque of El-Aksa at Jerusalem, supposed to be of the age of Justinian; both of these have this peculiarity, that the upper courses of the pendentives are thicker in the middle than at the ends, made so by means of a convex curve at top, and the joints are without mortar and beautifully worked. M. Choisy says that brick domes on pendentives of Roman times are found in the valleys of the Mæander and the Hermus, but that the practice only became common in Byzantine days. These domes were of two sorts, those in which the dome and pendentives were struck from the same centre, and those in which the pendentives and cupola were of a different radius; a course of bricks was originally laid over the arches and chamfered to make a skewback, against which the curve of the pendentive abutted, and the pendentive was backed up so as to form a square outside, consequently the dome had the appearance of rising from a square. For the sake of economy, this brick skewback was often left out, but it was found that the acute angle formed by the abutment of the pendentive against the arches was too weak, and they then abutted the pendentives at right angles to the arches, either by a two-centered arch, or by the arc of a circle, which prevented the pendentives being the arcs of the great circle, and as the dome took the form of the top of the pendentives, the domes were either squares with quadrant angles, or like an orange, squeezed in on four sides; these domes may be seen at St. Marks, and at Sta. Sophia, at Salonica.

These deformed shapes had, however, this advantage, that they could be used for oblong spaces; he observes, too, that when the cupola was of a smaller radius than the pendentives, the Byzantines used thin bricks for them, not thicker than a roofing-tile. The Byzantines gradually got to make these pendentives and domes as flat as was convenient, being only restrained by the impossibility of abutting the horizontal thrust when they were too flat.

It was not until the sixth century that domes were used of smaller radius than their pendentives, Sta. Sophia being one of the first known examples. M. Choisy also believes that it was not until the Macedonian dynasty, from the ninth to the tenth century, that drums began to be used, and that St. Bardias is one of the earliest examples (1028 A.D.).* In the decadence of the Byzantine Empire, pendentives became pure corbelling, which enabled the Byzantine architects, when working for the Turks, to cut them into fancy shapes.

There was no time in the lecture to compare the Persian proportions with the Byzantine ones.



A.

A shows the proportion of the great Hall at Sarvistan; half the opening is taken as the module on which is constructed an Egyptian right-angled triangle, A, B, C, whose sides are in the proportion of 3, 4, and 5, on which the proportions are founded. The width of the pier, E F = C B; on this is erected a square from which the arch of the opening springs. A circle struck from C gives the height of arch; the height up to the springing N = G F, and to M = K F. From M a line parallel to C B is drawn, and when this cuts the centre line a

See springing of domes in section of Sta. Sophia, *der*, Feb. 7.

" Ruins of the Palace of the Emperor Diocletian at ato." By R. Adam. 1764.

* On the architrave of the door is a Greek inscription stating that the church was built by Christopher Bardias his wife and family, in honour of the Virgin, with the date of the 12th indiction, 6537. This inscription is given by Texier and Pullan in their Byzantine Architecture, 1864, and by Duchésne and Bayet. "Mémoire sur une Mission au Mont Athos." (8vo. Paris, 1876.) And, curiously enough, they both agree in the date, though not in the translation. The era of Constantinople was 5508 or 5509, giving 1028 or 1029. From the acknowledged inaccuracy of Texier and Pullan, I have taken Duchésne and Bayet.

circle is turned giving the height of the dome.*

To revert to the groined vault, no matter whether the plan was square or oblong, if the line of the groin point became a semi-circle and the vault was generated on this, it became a dome, the pendentives being an integral portion of it. These domes could be worked in slices, just as the groined vaults were.

In almost every Byzantine church you see wooden ties that are carved in the fine ones and are plain in the ordinary ones. M. Choisy, who has visited a good part of Asia and Africa, recognises in these ties a triple duty. First, they acted as bond, to prevent unequal settlement while the work was being carried on; secondly, as ties or struts, to prevent the deformation of arches, vaults, and domes while the work was green; thirdly, as safeguards against the shocks of earthquakes to which Asia Minor is so subject. The Byzantines did not trust to these ties, as all the thrusts were amply abutted—they were only an additional precaution in case of earthquakes.

Probably the architectural students remember that the Temple of Diana at Ephesus was built on a marsh to minimise this risk, and that the foundations were laid on a bed of sheepskins and charcoal, the remains of which were found by the late Mr. Wood. Constantinople was equally liable to this terrible affliction; it is stated that a series of shocks took place for eleven consecutive months. The original dome of Sta. Sophia was so shaken that parts of it fell on two occasions, and Antioch, Berytus, and Nicomedia were destroyed by earthquakes during Justinian's reign. M. Choisy tells us that he visited Echekli a few months after an earthquake, and found to his astonishment that the mosques with domes were standing almost untouched in the midst of the ruins of the town. Vitruvius (Lib. 1, cap. 5, par. 3) tells us, that walls of cities should have their faces tied together frequently with charred olive wood. At St. Demetrius, at Salonica, a continuous band of planks was run through the arcades on the top of the caps of the columns. In the case of barrel vaults, there were two longitudinal plates on each side wall at about the slipping-point, with cross-ties halved on them; in groined vaults the plates and ties form a rectangle passing through the centres of the piers, and in domes four angle-ties go across as well. In the cistern of the thousand and one columns, there are holes at the top of the caps, on the four faces, where ties, in round or half-round timber, tied them to the other caps. All of us have seen the iron bars that run across the arcades of Westminster Abbey; and in certain cases the Byzantines used iron ties, as at Sta. Sophia, and in cases where an iron trellis was used, as the bond for piers, the ends of the bars were not let in, and run with lead, but were caulked up and down so as not to split the stone.

It should be remarked that the conception of abutments by the Byzantines, was diametrically opposed to that of the Westerns; the Westerns put their abutments outside, the Byzantines inside. The only exceptions I recollect are in the case of San Vitale at Ravenna and the church of Dighour in Armenia. Even as regards the sets-off to walls, the Byzantines usually make them inside. By the Byzantine method more ground space was got, with very little extra expense; but to our eyes the fact of the buildings being vaulted is not expressed, and those who like buildings cut up into slices complain of the want of light and shade.

The difference of thrust between groined vaults and domed structures is this: In groined vaults it is a direct outward diagonal thrust in the direction of the groin points, while in the dome it is a diffused thrust all round the periphery, and the aim of the Byzantine architects was to counteract this diffused thrust by other vaulted structures; so we see that, as a rule, the thrust of a central dome is abutted by wide barrel vaults on the four sides.

Another method was to abut a dome on pendentives, by four flat apses with domical heads. Sometimes a mixture of both is used; two sides are abutted by half-domes, and two by barrel vaults. At the Church of Sti. Apostoli at Athens, apparently once a baptistery, the thrusts of the four barrel vaults are abutted by triangular domes behind the columns, and by the heads of the niches. The plan of this church is set out geometrically; from the centre of the central dome a circle is struck; where the north and south and east and west diameters cut this circle are the centres of the apses; where the diagonals cut it are the centres of the niches. Sta. Sophia is the mixed case before mentioned, where two sides are abutted by apses, and two by barrel vaults.

The central dome and its pendentives are abutted east and west by hemicycles, and north and south by comparatively narrow arches; the hemicycles give abundant abutments, but the arches are of themselves insufficient, consequently the architect has carried two enormous piers on each side, from the nave to the external wall: the piers are hollow, and offer two spurs of irregular thickness,—those opposite the east and west arches of the nave being thicker, while the thinner spurs abut the pendentives.

In arranging the aisles, the point aimed at was to get the east and west arches of the dome

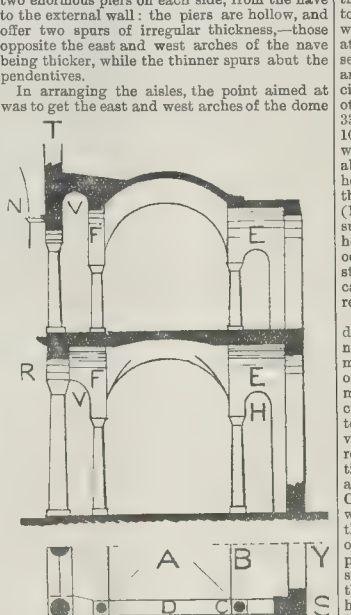


Fig. 14: from Choisy's "Art de bâtir chez les Byzantines."

(N; fig. 14) to spring as low as possible, so as to get the upper gallery of the aisles as an abutment, and these arches spring just above the caps of the upper arcade. The counterpoise of the aisles is thus effected:—The principal vaults have a direct thrust along the whole of their length, C B; the main ribs have a direct thrust at C: the thrust against line C B is counteracted by the barrel vaults E É; that of the ribs by the spurs C S. On the side of the nave, the resistance is more complex; there the thrusts of the aisle vaults are resisted by a double range of transverse vaults, V V¹, whose stability is secured by the superincumbent weight of the clearstory wall. The upper story has a barrel-vault between the walls on the front and the back columns, the lower one a half-barrel vault, bearing on the caps of the inner columns. The abutments are wholly internal, the barrel vault (E E¹) and the half-barrel (F) increase the internal covered space. The boldness of trusting to the abutment of narrow arches alone is surprising. This boldness was a little rash, for, at the first shock of earthquake, the very existence of the building was imperilled. The dome, which was originally too flat and not sufficiently abutted, fell, and had to be replaced with one of less thrust,—*i.e.*, of greater height; after this, a sinking in certain places occurred, the ground on which the four piers of the dome stood compressed more than the other foundations, the vaults between the inner and the outer main piers were forced out of shape, and had to be kept up by arches added underneath, supported on those piers, before mentioned that are nearly 6 ft. square, and which choke the circulation in the aisles; the pavement of the upper galleries slopes inwards to an extent that is visible, and these settlements happened within half a century of the building of Sta. Sophia; the pendentives are now surrounded with large masses of material which had to be built round them, to prevent the building going to ruin; but in spite of the original fault of construction, the church has lasted more than 1,300 years, and is one of the most magnificent creations of architecture. Its conception was too original to be perfectly carried out at the first attempt, but subsequent Byzantine architects continuously strove to avoid its defects, while following it as their model, and the best way to find out where it was weak is to compare it with the subsequent churches for which it has acted as a model. At Sta. Sophia, at Salonica, the arcades, north and south, were set back 11 ft. 4 in. from the face of the piers, and these barrel vaults have been found sufficient for the purpose, without requiring any other abutments, only in this case the dome is 33 ft. 6 in. diameter, and that of Sta. Sophia 103 ft. When the Byzantine architects had to work for their Turkish masters, they ultimately abutted the north and south sides as well by hemicycles, as at the mosque of Achmet. At the mosque of Adrianople, built for Selim II. (1566-74), the architect got eight points of support instead of four, omitted the grand hemicycles, abutting the skew sides of the octagon, and the kibla by apses, three of the straight sides by buttresses, containing staircases, and the fourth side by the walls of the recess of the kibla.

To me, the constructive improvements introduced by the Byzantines form a most fascinating study, as one can follow each improvement, from the simple wall to the abutments of vast domes, and can see the persistent efforts made to cure defects, and to get over the difficulties that arose in practice, while in addition to this, one sees that the eccentric shapes that vaults and domes often took are purely the result of the unimpeachable logic of construction. I think we in England have hardly shown a due sense of the gratitude we owe to M. Choisy, a Government engineer overwhelmed with work, who has devoted his holidays, and the small leisure he can find, to the elucidation of methods of construction that, before his publications, were absolutely incomprehensible,—who has followed up the subject with the sagacity and perseverance of a sleuth-hound; who has visited Italy, Dalmatia, Greece, Macedonia, Thrace, Asia Minor, Syria, and North Africa, to ascertain the different methods of Byzantine construction, and to make sure of his conclusions; no ruins, and no alterations that were being made, have escaped his vigilant eye, and he has observed all the current methods of construction, to see if any of the ancient practices are still preserved. I trust you will signify by your applause the benefits he has bestowed on us and on the world.

* Dieulafoy: "L'Art Antique de la Perse."

Illustrations.

ST. ALBANS CATHEDRAL.

IT is only within recent years that St. Albans has been the centre of a diocese, the first bishop being consecrated in 1877. For centuries before this it had been the head of the Benedictine monasteries in England, and one of the chief centres of the military and civil life of the day; its abbots were privileged to wear the mitre, and its shrines were the object of pilgrimage from all directions. As at Lichfield, the great church which now crowns the hill opposite the site of Roman Verulam was the result of the circumstances attending the life and death of its saint, in this case St. Alban, the proto-martyr of England. From a wooden shed, with little but its sanctity to impress beholders, it gradually grew to the large pile which we see, although in a mutilated condition, at the present day. The Norman builders were the first to make any decided change. What they found there is conjectural, but it was, in all probability, a building of some size, as there are still in the triforium of the transepts *balusters of an early date. It seems clear, however, that the early portions we have left—that is to say, the central tower, transepts and a considerable portion of the nave—are the work of Abbot Paul, of Caen (1077-1093), the balusters being probably re-used from the Saxon church which he destroyed. After a period of nearly a century, 1195, John de Cella, the twenty-first Abbot, commenced the alterations to the Nor-

*A view of the N transept, showing these balusters appeared in the *Builder* of April 5th, 1890



Cathedrals o

No. 3. ST. ALBANS I



nd and Wales.

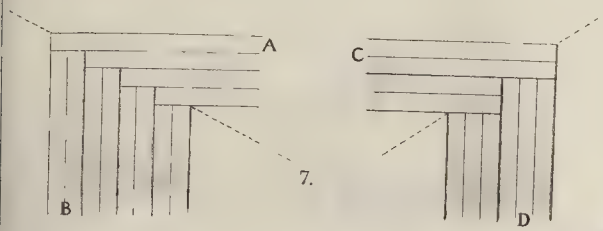
N BY MR. H. W. BREWER.



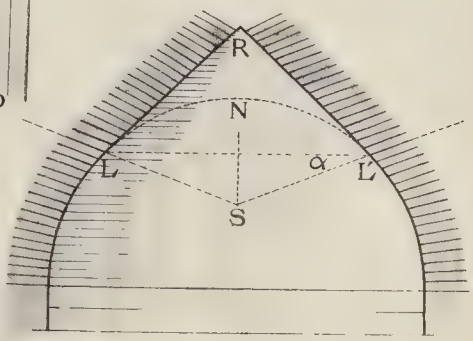
REMAINS OF THE PIER, &c., IN SEVILLE CATHEDRAL, AFTER THE FALL IN 1888,

FROM A PHOTOGRAPH.

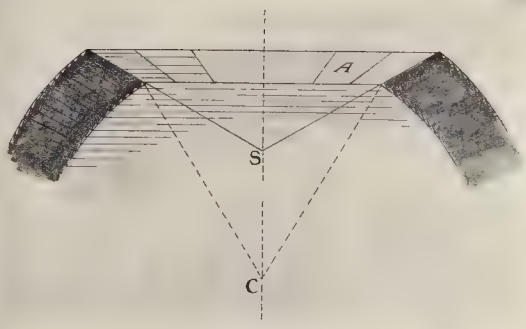
(See Report of Mr. Somers Clarke's Paper at the Institute of Architects).



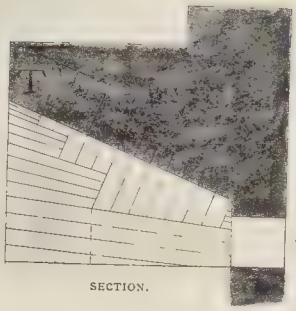
7. EXAMPLES OF FILLING IN OF OBLONG SPACES.



11. SECTION THROUGH AN ARAB DOME.

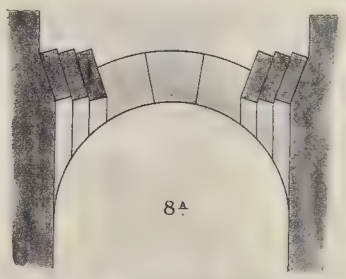


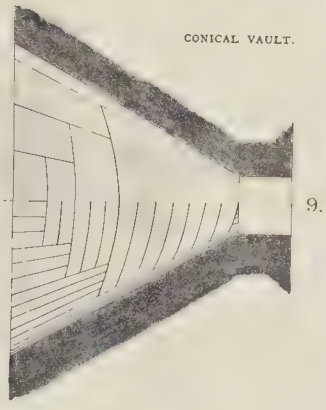
10. SECTION THROUGH A DOME, SHEWING THE COURSES NOT RADIATING TO CENTRE.

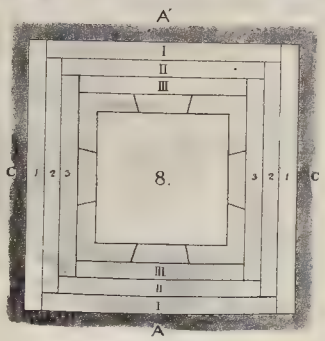


SECTION.

CONICAL VAULT.







GROINED VAULTS ON A SQUARE PLAN, LOOKING FROM ABOVE.

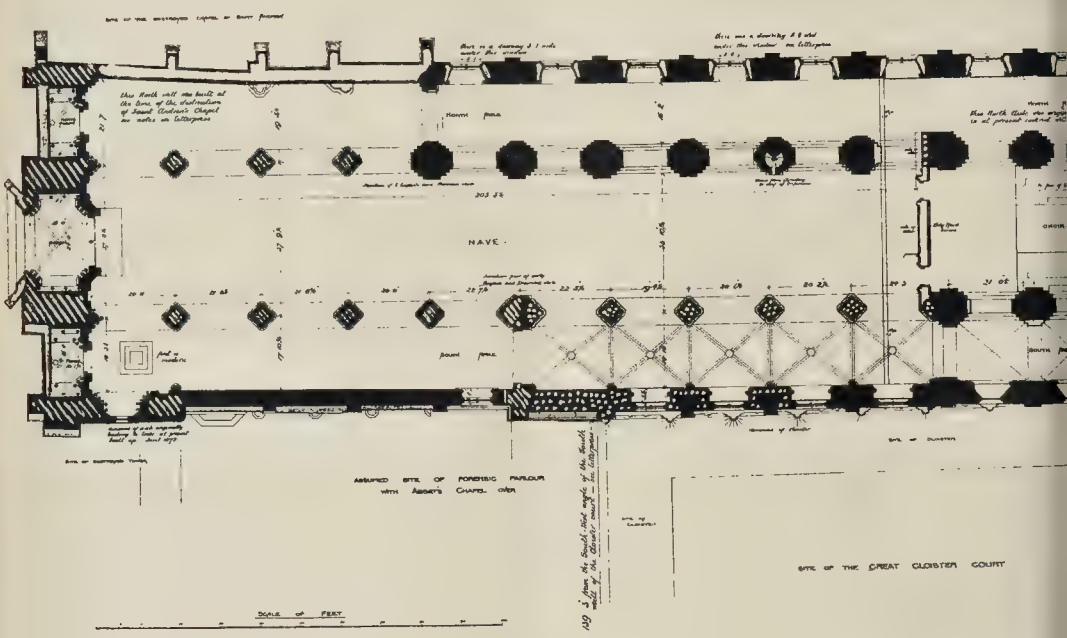
PLAN.

BYZANTINE ARCHITECTURE:

ILLUSTRATIONS TO PROFESSOR AITCHISON'S ROYAL ACADEMY LECTURES. LECTURE VI.

PLAN OF THE ABBEY CHURCH OF S: ALBAN

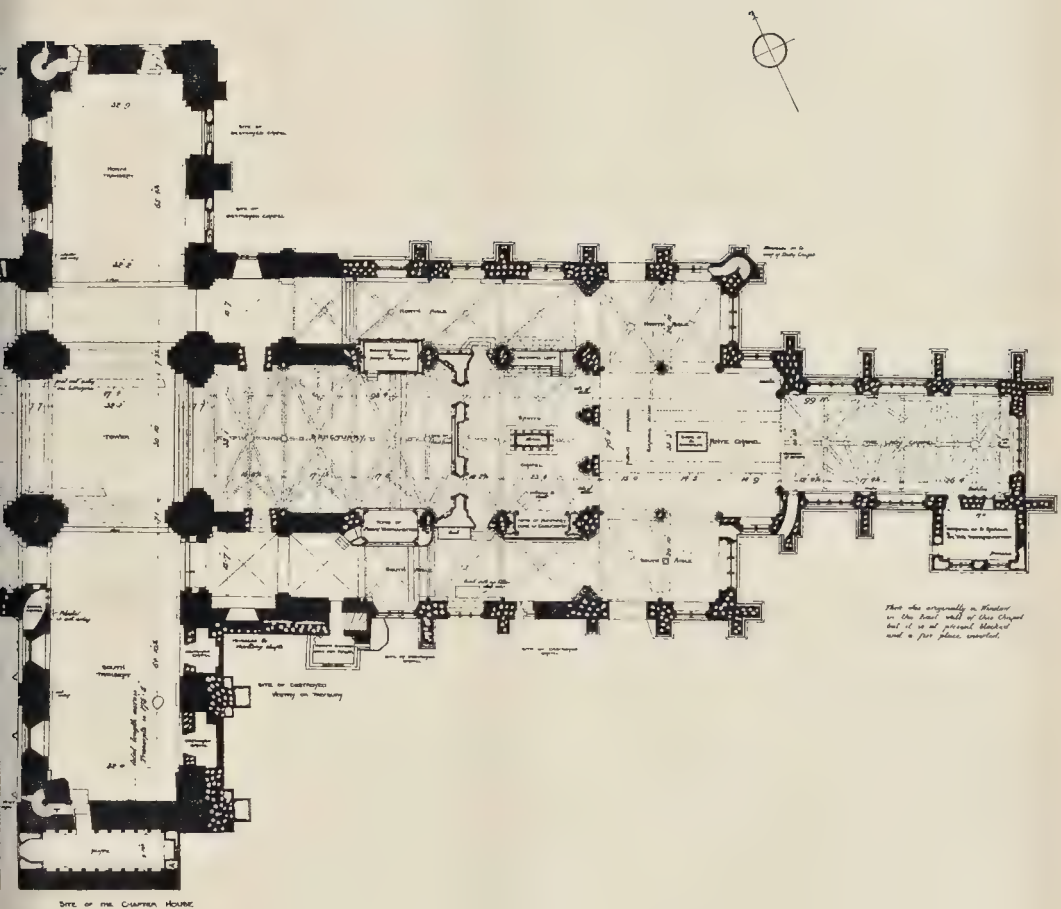
THE WHOLE OF THIS PLAN WAS MEASURED AND DRAWN TO SCALE ON THE SPOT



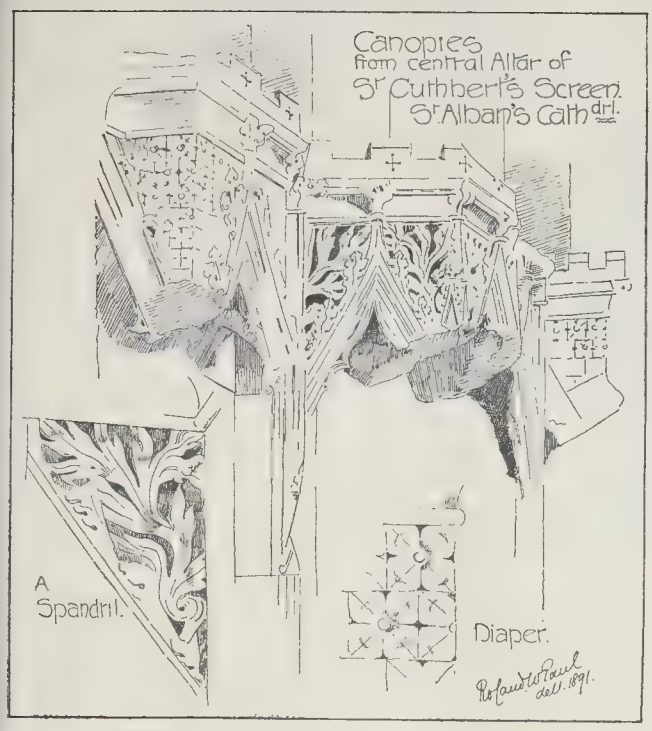
NORMAN.
EARLY ENGLISH
DECORATED.
PEPENDICULAR.

NOTE.—*The Plan is reduced from that given in M*
of date of various por

PHOTO LITHO SPRAGUE



work on St. Alban's; the indications
this Publication.



man church by pulling down the west front. He only partially succeeded in rebuilding it, the work coming to a standstill for want of funds. Those who remember the beautiful detail as it existed prior to the recent alterations will probably agree with the late Sir Gilbert Scott in doubting whether there existed "in England a work so perfect in art as the half-ruined portals of S. Albans" were at that time. John de Cella's work was continued by his successor William de Trumpington, who completed the west front and also rebuilt, in the style of the period, five bays of the nave on the south side and four on the north. The next great alteration was the remodelling of the eastern portion of the presbytery. The work, which is of two dates, was in all probability begun by Abbot John de Norton 1260-1290, who replaced the Norman apse by the present presbytery, carrying his work eastward, and laying the foundations of the Lady Chapel. Up to the cills of the windows is probably his work; the upper portion, which has long been known as a gem of Decorated work, being of Abbot Eversdon's time (1308-1326). The flat panelled ceiling over the ante-chapel is of this later date, or rather *was*, it being in so dilapidated a state as to require replacing by a copy during the restoration, under the late Sir G. G. Scott. During Eversdon's abbacy also, five bays on the south side of the nave, eastward of Trumpington's work, were also rebuilt, the Norman work having fallen suddenly on St. Paulinus' day 1323. The cloisters, probably owing to this catastrophe, were rebuilt; but Mr. Neale in his valuable work on the building considers that this was probably the work of Richard de Walyngford (1326-1335).

Hugh de Eversdon's work may be said to have been the last great structural change that the abbey underwent. Lesser details—such as the windows, were altered from time to time; the three great windows, two at the end of the transepts and one at the west end, being the most important, and the work of John of Wheathampstead (1420-1440). The extra mural chapel of St. Andrew, on the north-west of the nave, should also be added to the list of comparatively minor alterations and additions. Reference to the plan (which Mr. James Neale has kindly allowed us to reproduce from his original drawing, with notes as to the various dates added), will show how closely the simple form of the early church was adhered to. The great feature in the plan is the unusual, in fact unique length of the nave, which is the longest in England, 284 ft. The transepts have no aisles and have been shorn of their eastern Norman chapels. As we found at Lichfield, the eastern tower of the Norman church has been entirely remodelled, and the apsidal termination has disappeared, but a portion of the walls (two western bays) next the great central tower, were no doubt left to ensure the safety of that structure, and were simply arcaded to match the new presbytery arches.*

The interior in its original state was probably for richness without a rival. Much of its glory has departed, and is even now disappearing,† but what is left is a wonderful example of the care and thought which was lavished on the tombs and shrines in Mediæval days.

For descriptive purposes it is best to divide the interior of the church into three parts:—(1) the nave to the rood-screen; (2) the choir to the altar-screen; and (3) the portion of the church east of the altar-screen.

The chief objects of interest in the nave are the different styles exhibited in the arcading, the changes in which have been already alluded to, the frescoes on the Norman piers on the north side near the rood-screen, and the delicate piscina against the inner face of the west wall. The rood-screen, of Decorated date and sometimes called St. Cuthbert's screen, against which was a central altar, and another in the north aisle, is a magnificent piece of work, some of the spandrels being of very delicate workmanship. It seems probable that the same hand worked on this as on a small reredos in the north transept at Wheathampstead church a few miles north, the work in the spandrels being almost identical. The central altar has now been fitted up, and service is held here during the "restoration" of the eastern portion of the church, which Lord Grimthorpe has at present in hand.

Between the rood-screen and the tower there is little perhaps of interest. The choir ceiling is flat and painted, dating probably about 1440. In the south wall of the aisle is a recess for a tomb, and the doorway which formerly led to the cloisters. The transepts are chiefly remarkable for the early work, as already mentioned, which still remains in the triforium arcades. Until recently an interesting slype existed south of the south transept, but this has been removed, and the large Perpendicular window of Wheathampstead's time taken out. On the door which led to this slype was a good piece of early ironwork, and in one of the recesses, formerly a chapel on the east side of the south transept, is a small collection of fragments of carved work which have been discovered from time to time. It is however in the sanctuary that the rich detail commences. Fronting us is the high altar screen reaching to the level of the top of the triforium, built by Abbot Walyngford 1476-84, and one of the same type to which those at Winchester, Christchurch, and S. Saviour's, Southwark, belong. On the right stands Wheathampstead's tomb, in which is placed the magnificent Flemish brass of Abbot de la Mare (1349-1396). On the left or north side is the chantry of Abbot Ramryge (1492) a marvel of delicate carving. A general idea of the appearance of this chantry is given in the subjoined sketch, and also details of an angle and pastoral staves held by rams (a rebus on the name) who act as supporters to the arms in the lower panels. The whole chantry has a general resemblance to others of the same date, but the clever filling in of the arch of the arcade with tall and slender canopied arches divided by upright bands of open tracery has an unusually elaborate effect. Eastward of the great screen (which has now, through the liberality of Mr. H. Hucks Gibbs, been restored, and refitted with figures)* comes the Saints Chapel. The centre is occupied by the shrine of St. Alban, which was found in fragments in 1872 built up in the arches at the east end of the Presbytery.† The material of which it was constructed,—Purbeck marble,—does not seem to have prevented the carver from obtaining the most delicate effect in the spandrils and carving generally. We give three of the pieces of carved foliage which occupy gables on the south side. The spaces between the gables were filled with seated figures with the martyrdom of St. Alban at one end, and the scourging of St. Amphibalus at the other, while the angles of the shrine had censing angels. The whole is surmounted by a rich cornice and a mutilated cresting.

North of the Saints' Chapel stands the watching loft, of fifteenth century date and of wood, with a glazed lower story for the exhibition of relics.

On the south stands the monument of Humphrey, Duke of Gloucester, the upper portion of similar design to the Ramryge Chantry, but later in its details. There are some splendid specimens of heraldic work on this monument, which has been well engraved by Blore. Here, as at Westminster, the Saints' Chapel is on a level with the sanctuary, and approached by doorways in screens from the side aisles or ambulatories. Opposite Duke Humphrey's monument was, until recently, a panelled arch, which formed part of an external chapel. (See plan.) Against the east wall was a fragment of the old rood beam which had been brought from the nave.

In the anti-chapel to the Lady Chapel is a second shrine, that of Saint Amphibalus. Like St. Alban's shrine, it has been gradually put together from fragments discovered during the restoration, but it is far less perfect. It is of two bays, of Totternhoe stone, and retains traces on the lower portion of the words "Amphibalus," and the initials R. W. (Ralph Witechurche, sacrist in the time of Abbot de la Mare, 1349-96, at whose cost it was erected).

The wall arcading of this portion of the church has of necessity been a good deal restored, for a passage formerly ran through the church at this point, and the Lady Chapel itself was a school.

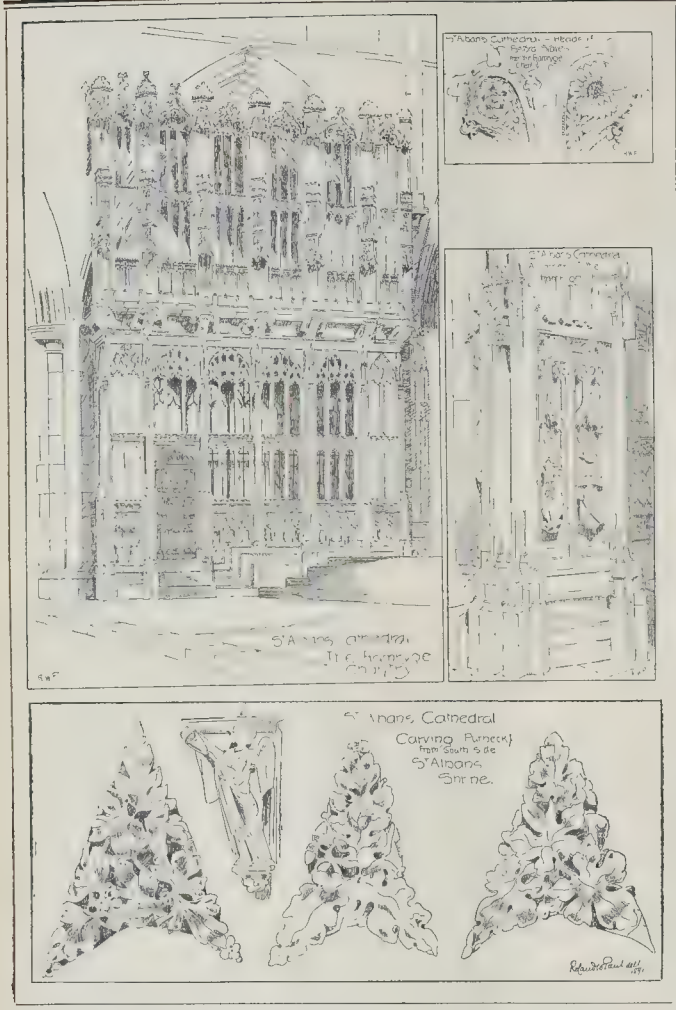
The Lady Chapel (of which we gave interior views in our issue of April 5, 1890) forms a fitting termination to this fine church. The interior with its figure sculpture, and painted niches must have been very gorgeous. A large number of the figures are still left, and there is some very beautiful canopy work over the sedilia. This chapel is vaulted in wood. In

* Shown in a view looking into the choir in our issue for April 5, 1890.

† During the present year the remains of an external chapel on the south side of the presbytery aisle have been cleared away.

* See *Builder*, October 29, 1887.

† In the *Builder* for May 4, 1872, a full description was given of the design with engravings taken from photographs. A general view as it is at present was given in the *Builder*, October 29, 1887.



fact, with the exception of the aisles the whole of the church is either vaulted or ceiled in wood, the presbytery vaulting being a fine specimen, with its colour remaining.

During the last few years St. Albans has been the object of a large amount of discussion. Into the merits of the case this is not a suitable place to enter, but all lovers of what is most beautiful in our mediæval buildings must deplore the destruction of many objects of interest which during the last few years this cathedral has suffered and is still unfortunately suffering.

It is on this account that we have preferred to give a view of the cathedral as it existed prior to these alterations. To have given the south transept as now existing would only have been to have paid an undeserved compliment to an architectural monstrosity.

BYZANTINE ARCHITECTURE.

THE diagrams of Byzantine construction are a portion of the illustrations to Professor Aitchisons sixth and last Royal Academy lecture, and are referred to and explained in the lecture, which is printed in another column.

REMAINS IN SEVILLE CATHEDRAL.

THIS view of the scene after the fall of the crossing pier in Seville Cathedral is from a photograph taken immediately after the catastrophe. It is introduced here in illustration of Mr. Somers Clarke's paper, read at the Institute of Architects' meeting, and is referred to in the report of that lecture.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting of the members took place on Monday last at 9 Conduit-st., Mr. Alfred Waterhouse, R.A. (President), in the chair.

The Royal Gold Medal.

On the motion of the President, the following resolution was agreed to:—

"That, subject to Her Majesty's gracious sanction, the Royal Gold Medal for the year 1891 be presented to Sir Arthur W. Blomfield, A.R.A., *Past Vice-President*, for his works as an Architect."

The ninth ordinary meeting of the session followed.

Election of New Members.

The following candidates were elected by ballot:—

As Fellows:—Mr. George Highton, London; Mr. Arthur Harrison Newman (*Associate*), London; Mr. Alfred Saxon Snell (*Associate*), London; Mr. William Gratus Coward, Sydney; Mr. Henry Tanner (*Associate*), of H.M. Office of Works, London; Mr. Theophilus Allen (*Associate*), London; Mr. Arthur Ardron, London; Mr. William Henry Knowles, Newcastle-upon-Tyne; Mr. Dudley Newman, London; Mr. James William Beaumont, Manchester; Mr. Charles Francis Armstrong, Newcastle-upon-Tyne; Mr. Joseph Oswald, Newcastle-upon-Tyne; Mr. George Henry Hunt, London; Mr. Henry Perkin, Leeds; Mr. George Bertram Bulmer, Leeds; Mr. James Philip Moore, Gloucester; Mr. William Dowdall (*Associate*), Shanghai; Mr. William Edward Brown (*Associate*), London; and Mr. Alexander Nelson Hansell, Hiogo, Japan.

As Associates.—The following candidates were next elected as Associates on a show of hands:—Mr. William Tait Conner, London; Mr. Vivian Edward Young, London; Mr. Francis William Bedford (*Ashpitel Prizeman*), Leeds; and Mr. Charles Hilbert Strange, London.

The Fall of One of the Central Pillars at Seville Cathedral.

Mr. Somers Clarke then read an interesting paper bearing this title. He commenced with a historical sketch of the whole fabric. The cathedral covered the site of a mosque, the plan of which, as at Cordova, was a great rectangle inclosed by lofty walls of dried mud, fortified by buttress towers and battlemented. The north part of the rectangle formed an open courtyard; the south part was covered in, forming a series of parallel aisles, their main axis running north and south; and the aisles were open to the court at their north end. This court of the mosque, with its enclosing wall, still remained, and from the position of the great tower, the Giralda, he concluded that the cathedral occupied the exact site of the covered part of the mosque. Documentary evidence was wanting as to what was done to render the mosque suitable to the purposes of a church, but in 1389-1390 various additions and repairs were effected. In 1401, however, the Chapter resolved to build an entirely new cathedral; and in 1403 the work was begun, continuing for fully a century. The plans of the church were said to have been removed to Madrid during the sixteenth century, and to have been unfortunately consumed by fire in 1734; but a fairly correct plan was to be found in Fergusson's "Handbook of Architecture." The cathedral covered an area some 400 ft. long by 280 ft. wide, and consisted of a great nave of five bays, the crossing, and an eastern limb of three bays. The nave and the eastern limb of the cross were flanked by two aisles on either side, the external aisles being flanked on the outer sides by deep chapels filling in the spaces between the buttresses. Nothing could be simpler than the plan; the transepts did not project beyond the outer line of the chapels: and the east wall was treated in a similar way to the side walls, with chapels between the buttresses, the centre of the line, however, being broken by the "Capilla Real," a building of later date than the original church. Turning to the interior arrangements, of the five bays of the nave the two easternmost were occupied after the Spanish manner by the enclosed *coro*; the crossing was open; two of the three bays east of it were occupied by the *capilla major*, with the high altar and the sacristy behind it; the third and most eastern bay serving as an aisle behind the sacristy. The plan was typically Spanish, but differed from most of the great churches in having a square east end and not an apse. Many of the parish churches in Seville were also square-ended, and the choir at Cordova had a square east end. It was not improbable that the taste for the great reredos was an important factor in the building of square east ends, as at Winchester, where the great reredos turned an apsidal choir into one square-ended The author considered that buildings on Moorish lines might have set a local fashion to Andalusia. Having referred to the plans of the early churches in Spain—which showed a distinctly French origin, notably the Cathedral of Burgos, the earlier church of Santiago of Compostella, Leon, and Toledo—with reference to the *coro* the author stated that the building at Seville was clearly laid out for the *coro* to be west of the crossing. He considered that at Seville the Spanish plan became thoroughly stereotyped, and that when it had been once decided that the people should be admitted to the crossing and transepts east of the stalls, and that the canons and their stalls should be behind the people, common sense dictated a change of plan, the northern plan of a long nave with numerous points of support being given up.

In England, Germany, and the North of France the nave altar played an important part. Spanish custom changed this, and the large space needed at the crossing involved wide spans and broad transepts, ending in the square instead of the long plan of church, and wide spacing of pillars as against small bays. In Street's "Gothic Architecture in Spain" an interesting account was given of the Spanish arrangement of the *coro;* and although a very similar arrangement would be found at West-

minster Abbey, that was not ancient, but dated from 1848, when the solid screens crossing the transept were removed with the same object as in Spain, namely, — the nave altar having gone, to concentrate the people at the east end about the high altar. The author then gave detailed dimensions of the nave, transepts and chapels of Seville Cathedral, and showed on how vast a scale the building was laid out, the total length from east to west of each aisle being a little in excess of the full length of Westminster Abbey from the west end to the apse. Seville Cathedral was a genuine piece of Mediæval Pointed work, and differed most materially from that at Milan, while in the entire absence of iron ties it was vastly superior. A study of later Pointed work in Spain showed that, as the French influence died out, the Spaniard grasped firmly the infinite capabilities of the Pointed style.

The author then proceeded to deal with the decay of the fabric, and considered that, as at St. Peter's, hurry to see something done had been the bane of the building, cracks and settlements having revealed themselves even during the progress of the work. A report dated November 15th, 1508, showed that water had entered at the tops of the walls and by the vaults, that the stone was not as good as it should have been, and that sundry pinnacles were either unfinished or ruinous. A portion of the report, in which it was recommended to cover the outside of the vaults with plaster, and to pave the thickness of the walls with brick tiles was then quoted; whether the recommendations were carried out or not Mr. Clarke could not say, but on December 28, 1511, one of the four pillars at the crossing, split, opened, and fell, bringing with it the lantern and three of the great arches. The construction of the new *cimborio*, or central lantern, was finished in 1517, but instead of rising some 100 ft. above the great vaults, it stood up but 25 ft. or 30 ft. A report of great interest, found in the Chapter documents, on the "damages (and remedy for them)" which the structure received from an earthquake was here referred to, and extracts quoted in full. From this report it appeared that the pillar which fell was the north-west pillar at the crossing, opposite to that which fell in 1888; and that earthquakes and the use of stone too soft for the purpose had hastened the fall of the original central tower. The new *cimborio* had four heavy corner turrets, which were removed to lighten the burden of the great pillars, the sectional area of which was described as being fully 100 square feet, English measure. They rose a clear 70 ft., and then received on two sides the arches opening into the aisles. Although lofty, the pillars were very large, and the construction above was solid and stable. Signor Casanova, who at the time of the author's visit to Seville was the architect in charge, pointed out that in many of the great pillars carrying the nave vault the interior was not much better than earth, whilst the external surface was of poor and non-resisting material.

In 1878, on Mr. Clarke's first visit, the building seemed the picture of solidity. In 1882 Signor Casanova reported upon the state of the *cimborio*; and again in 1883, after the earthquake of the preceding October. In December, 1884, came another earthquake, but work was not begun until about 1887. To relieve the piers of the crossing, the vault was taken off the south transept, as also that of one bay of the north transept; the weakest pillars were supported by vertical baulks of timber; and in all directions the system of support seemed excellent. So little was it apprehended that the great south-west pillar of the *cimborio* would yield, that the stalls in the *coro* were not removed, the great iron screen which shut in the *coro* was left, and the south organ was not taken away. On August 1, 1888, however, this great pillar fell, bringing with it the two arches, carrying the south and west walls of the *cimborio*, together with one arch of the nave arcade, one of the transept, and all the vaulting adjoining. The way in which the pier broke seemed to indicate that in its reconstruction after 1511 it was not rebuilt from the ground. A large portion was evidently left, and the new work built upon it. The photograph which we reproduce, and which was taken immediately after the fall, shows that the upper part of the pillar, with a great piece of wall, and the spring of the cross arch and vaults fell in one piece,—a vast mass descending with the force of a battering-ram, and digging a tremendous hole through the marble pavement into the ground beneath. The solid work seems to have begun a little above the springing level of the nave arcades. The old masonry, not reconstructed in 1511, evidently crumbled under it. The author thought that the removal of the adjoining pillar on the south had partly caused the fall of the south-west pillar; and that directly the old part of the pier began to yield under the strain from the adjoining arch, the new work slipped forward and let down everything near it. Notwithstanding the mass of masonry that fell, the amount of damage done to the furniture and decorations had been but slight. The church had hitherto escaped the ravages of restorers, and remained a building of most majestic proportions and pleasant colour, and the author hoped the public money which was being spent upon it would go in the direction of absolute conservation and repairs. In conclusion, he thought it probable that a careful study, similar to that given by Professor Willis to the fall of Chichester spire, would show where the work was rebuilt after 1511, and how far the new catastrophe was consequent upon the old.

Mr. William White, F.S.A., proposed a vote of thanks to Mr. Somers Clarke. The paper had been interesting as showing the diversity of church planning and arrangement in different countries. It was interesting also to hear the reports of the old architects, demonstrating how carefully they had considered matters, and that in the face of the great want of care which was so manifest in much of the structure itself.

Mr. R. Herbert Carpenter seconded the vote of thanks, and compared the fall of the Seville pillar with the catastrophe at Chichester. There the south-west piers first gave way, and was utterly destroyed except a low pyramidal-shaped mass, the tower slipping off the eastern piers, leaving them almost entire. At the apex of the ruined pier was found, surrounded by dust and rubbish as a core, a large sea-worn boulder, on which the weight of the superstructure had pressed, thus bursting out the facing all round some 5 ft. from the floor, while great masses of the well-built thirteenth century lantern came down uninjured. He believed that the work of restoration at Seville was begun rather earlier than stated by Mr. Clarke. He (the speaker) was there in 1882 when the North transept and crossing were well filled with scaffolding, and the clearstory windows of the *capilla major* and transept were removed and laid out on the back of the aisle vault, their openings being filled with shoring. With the exception of the Cathedral of Barcelona, there was, he thought, hardly any building in Europe so beautiful in colour and tone as Seville Cathedral; in fact, to his mind, internally it was one of the noblest buildings in the world.

The President said that there were several churches in the north and south of Spain with circular east ends, but that might perhaps arise from French influence. The members were very much indebted to Mr. Somers Clarke for the lucid manner in which he had explained the works that had gone on at Seville, and which had finally occasioned the catastrophe they all so much regretted. The works undertaken in 1511 were certainly of a superior character, because the piece of the pier which fell was, he believed, about 40 ft. long, and 15 ft. square both ways, so that it was an enormous mass to fall whole to the ground, and yet it appeared to have come down without a flaw. In that respect it seemed to him that the pier at Seville was very different to the one that gave way at Chichester. The Chichester pier had a good skin and a uniformly defective interior, while the pier at Seville was bad at the bottom but had a thoroughly sound upper portion, as was evidenced by the way in which the mass came down; in fact, it must have slid on the old and bad lower portion, and so have occasioned the catastrophe. It was to be regretted that the architect who was conducting the works at the time of the disaster, and who seemed to have taken a great deal of pains, should have been replaced by another gentleman, though it was nothing more than might have been expected.

The vote of thanks was then passed by acclamation, and briefly acknowledged by the lecturer.

The President announced that the next meeting would take place on the 23rd inst., when Mr. Simonds would read a paper entitled "Some Aspects of Sculpture in Relation to Architecture."

The proceedings then terminated.

THE LONDON COUNTY COUNCIL.

LAST Tuesday's meeting of the London County Council was almost entirely taken up by discussions on financial topics, and the consideration of many items of interest to our readers had to be postponed.

In the course of the proceedings, it was incidentally stated that before very long an important report will be brought up from the Main Drainage Committee, recommending, on the advice of the Engineer to the Council, an expenditure at an early date of no less than 2,250,000*l.* on the improvement and supplementing of the main-drainage works of London, in order to bring the main-drainage system into a position to cope with the demands made upon it owing to the growth of the metropolis since the system was planned some thirty years or more ago.

Next Tuesday the Council will meet three hours earlier than usual, *i.e.*, at 12 noon instead of 3 p.m.; and it is also proposed to hold a special meeting on Friday next, the 13th inst. But the *agenda* is so crowded that even with this extra time it will not be cleared before Easter unless some of the members become less loquacious than it is their wont to be.

THE ARCHITECTURAL ASSOCIATION VISITS:

ST. PHILIP'S CHURCH, STEPNEY.

THIS church, which is now being completed from the designs of Mr. Arthur Cawston, was visited by a large number of members on the afternoon of Saturday, February 28, on the occasion of the second sessional visit. The party was received by Mr. Cawston, who gave an interesting description of the conditions under which the design had been prepared, and referred to the aims of the Vicar to make the church an artistic resting-place, in striking contrast to the surrounding neighbourhood, instead of following the too usual custom of providing the greatest number of sittings at the cheapest possible rate. A plan, some interior views, and an account of the building, appeared in our issue of October 11, 1890, and it is there stated that the nave and aisles were completed last year. The transepts, chancel, and morning chapel are now in course of erection. The materials employed for the interior are stock bricks and Bath stone, treated in the way with which Mr. Pearson in his London churches has made familiar, whilst Ancaster stone and red brick have been used in the exterior.

LECTURES AT UNIVERSITY COLLEGE.

ON Thursday, the 26th ult., Professor Poole gave the last of his series of lectures on Greek art.* After recapitulating some of his former statements, he said that the Parthenon is undoubtedly the object of greatest interest, inasmuch as Phidias had such a large share in the work. The metopes may be earlier, but the pediments are manifestly his, or were prepared under his direction; and Mr. Watts (the greatest authority on such a point) declares that the fine figure of the horse was unquestionably the master's own work; while it is more than likely that he also is the creator of the greater part of the frieze, and the assembly of the gods (the most important subject except the goddess Athene herself). For all time Phidias has given here the ideal of the frieze. In the second period of Greek art Praxiteles, Scopas, and others were no doubt largely influenced by painting, and we observe that the sculpture in that case ceases to give the *character* and presents only the *momentary*, so that accessories are needed to discover who the deities or persons are. Greek art is emphatically true to life and thoroughly honest, so much so that in the mausoleum figures have the beards most carefully executed when no telescopes existed to examine them! The dead Amazon is about the finest work (except the charioteer by Scopas), and gives a wonderful conception of death. The artists in the mausoleum wisely gave up the Centaur and took to the Amazon. Lisippus endeavoured to bring out his work by lengthened proportions, as is

* For brief reports of the previous lectures see pp. 70 127, 149, 172, *ante*.

seen in the Venus de Milo, and thus followed what may be termed the dramatic style. The Græco-Roman Hermes, again, has lost all the sweetness of the original by Praxiteles, although it shows a wonderful knowledge of anatomy. Professor Poole next spoke of coins, reminding his audience that their date is always about twenty years later than the sculpture. The fine coin of Naples, with the siren's head, belongs to the Italian school. The Athenian artists in Italy, when released from their own rules, became freer. In Sicily we have a peculiar local school, and we have there no influence of painting. In Asia Minor we see in the coins the enormous strength of the pictorial, as in the statues of Apollo, Demeter, and Odysseus, where we have the flowing hair, presenting the moment and not the character. In the Cretan school we find all the workers to be thorough open-air artists. The way in which the Athenian artists were freed from their old restraints is seen *e.g.* in the figure of Nikè at Tyrrhenium. The Victory is poised exquisitely and naturally, like a bird on its wings, and Professor Poole declared that this was no copy of the Greek statue, but the result of a recollection, which accounted for its likeness to the original more than if it had been slavishly imitated. The lecturer next spoke of the drum of the column of Ephesus, which was the latest work of this school, except the descent of Alcestis to Hades, one of the finest conceptions (and which redeems Euripides from the charge of misogynism). The artist has exquisitely shown the pain that Hermes feels in his duty of accompanying the devoted wife to Hades. The earliest portrait is that of King Mausolus in the mausoleum, but unquestionably the finest portrait (Professor Poole, thought) is that of Alexander, executed twenty years later by Lisippus, and which forms a great contrast to the weak and exaggerated portrait of Philip V., taken long after. Mr. C. Harcourt Smith gives his lecture on Greek painting and vases on Thursday (March 5).

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—The sixth ordinary meeting of the present session of the Liverpool Architectural Society was held on the 2nd inst., at the Royal Institution, under the chairmanship of Mr. T. M. Reade, President. A paper on "Foundations and Foundation Walls" was read by Mr. J. A. Berrington, who dealt with foundations of all descriptions, not confining himself to such as were of a purely architectural character. The various methods of dealing with the different classes of ground experienced were mentioned, the descriptions of foundation grounds treated of, comprising rock, gravel, or other such firm ground; sand, clay, or other movable foundations; firm ground over soft, soft ground over firm, and soft ground of great thickness. Mr. Berrington described the methods ordinarily and safely to be adopted under the varying conditions referred to.

MANCHESTER ARCHITECTURAL ASSOCIATION.—The last ordinary meeting of this association was held at the Diocesan-buildings, on Tuesday, Mr. T. Chadwick, President, in the chair. A paper was read by Mr. Banister Fletcher, jun., of London, on "The late Paris Exhibition from an Architect's point of view." The paper was illustrated by numerous drawings and photographs. A vote of thanks, proposed by Mr. Mee, seconded by Mr. Hewitt, and supported by Messrs. Hodgson and Wilkinson, concluded the meeting.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At an ordinary meeting of the Edinburgh Architectural Association, held on the 26th ult., Mr. James Thomson, C.E., read a paper entitled "Notes on some Defects in Modern Sanitary Practice." Mr. George Aitken, architect, presided. In the course of his paper, Mr. Thomson condemned (1) the defective arrangements usually provided for the inspection of outlet drains from buildings; (2) under certain conditions, the placing of open channels within man-holes and the leaving of leaky drains within two or three yards of houses; (3) the present method of forming the access eyes of open traps; (4) the grease-boxes in common use; (5) the present method of ventilating soil and waste pipes; (6) the practice of placing traps too far away from their connecting fittings and of fixing them permanently to the fittings; (7) the having untrapped waste-pipes, and having only one trap for several waste-pipes; (8) the use of small outlet gratings and large waste-pipes; (9) the practice of carrying the disconnexion too far; (10) the use of water-closets with earthenware traps; (11) the use of iron soil-pipes and iron water-cisterns; (12) the practice of attempting to estimate and carry out sanitary work without a workable plan and description of the work. He advised architects, sanitary engineers, and their clients to see that such plans were provided, and that they were provided in such a manner that they would contribute to the education as well as the information of the tradesmen employed.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS:

ANNUAL DINNER.

THE annual dinner of the donors, subscribers, members, and friends of this Institution (which was established in 1842), was held on Saturday evening last in the Venetian Room of the Holborn Restaurant, Mr. John Mowlem Burt (head of the firm of John Mowlem & Co.) in the chair. There was a very large attendance.

The Chairman, in proposing the toast of the evening, "The Provident Institution of Builders' Foremen and Clerks of Works," said he found his task an easy one, for the institution was evidently in a prosperous and flourishing condition, having a very fair surplus in hand. The objects of the institution were four-fold,—firstly, to maintain the respectability of its members,—and nobody could find fault with that, although he wished those members were more numerous, for they scarcely numbered one hundred; surely the architects and builders of London were sufficiently numerous to require the help of more than one hundred respectable foremen and clerks of works? The second object of the Institution was to obtain information for its members as to situations vacant,—a very desirable thing; thirdly, the Institution was for the purpose of rendering assistance to aged, afflicted, and infirm members; and fourthly, it afforded provision for the widows and orphans of deceased members. The last two objects of the Institution were highly commendable. On looking at the report and accounts, he found that since the formation of the Institution about 7,500*l.* had been paid in pensions, &c., to members or their widows and orphans. Last year the amount so expended was £317. The Institution also had invested in funds and in cash in hand the sum of about 5,000*l.*,—a very respectable reserve for such an Institution, which was one not dependent on voluntary subscriptions alone, but was based upon the principle of self-help. The Institution was so excellent in its aims and in its management that he wondered it did not possess a longer roll of members. He impressed upon the officers of the Institution the desirability of trying to extend the benefits of the Institution to a larger number of builders' foremen and clerks of works. With the toast he coupled the name of Mr. J. W. H. Bedford, one of the Hon. Secretaries.

Mr. Bedford, in response, said they would be very glad to see an addition to their roll of membership, and would be glad to entertain any application for membership. But all candidates must be able to present "a clean sheet," and must not exceed forty-five years of age.

Mr. W. Bune proposed "The Governor (Mr. George Plucknett, J.P., F.S.A.), Trustees, Donors, Honorary Subscribers, and Visitors," and referred to the great services which their respected Governor had rendered them for so many years. He also expressed the indebtedness of the Institution to the other gentlemen included in the toast, especially to the donors and subscribers, without whose aid the Institution would not be able to afford such material help to its pensioners as it was now able to give. With the toast was coupled the name of Mr. Alexander Ritchie (of the firm of Steven Bros. & Co.), who briefly replied.

The next toast was "The Architects, Surveyors, and Engineers," proposed by the Chairman and coupled with the names of Mr. Robert Walker, F.R.I.B.A., Mr. Drower, and Mr. John Wilson, Engineer of the Great Eastern Railway, who severally replied.

The other toasts were "The Builders" (proposed by Mr. Strudwick and coupled with the name of Mr. J. Howard Colls); "The Press" (proposed by Mr. George Burt, junr., and coupled with the name of the representative of the *Builder*); and "The Chairman," proposed by Mr. Bedford.

During the evening, the Financial Secretary, Mr. Merifield, announced subscriptions and donations to the amount of about £45.

[We may add, for the information of our readers, that the office of the Institution is at No. 9, Conduit-street, W.]

EXHIBITION OF ART BRASS WORK.—About the middle of May next the Armourers and Brasiers' Company will hold a second exhibition of art brass work at their hall in Coleman-street. Prizes will be given to designers, craftsmen, apprentices, students, and amateurs, and the exhibits will be confined to the work of British subjects, manufactured since January 1st, 1889.—*City Press.*

Correspondence.

To the Editor of THE BUILDER.

HANOVER CHAPEL.

SIR,—There is a Bill now before Parliament to enable the parish authorities to pull down Hanover Chapel, Regent-street, on account of the large rental to be obtained from the site. From pressure of business in the House it is to be feared that this piece of Vandalism may be overlooked, and one of our celebrated monuments destroyed, unless public attention be drawn to it. This beautiful classic church was designed by the late Prof. Cockerell, and exhibits that grace, elegance, and originality for which he was so justly celebrated. The refinement and grace always found in Cockerell's work may perhaps be accounted for by his being, like the Greeks and the early Renaissance architects of Italy, a figure-draughtsman and designer of sculpture, as well as an accomplished architect. This church has done much to remove from London the stigma affixed to it by Continental critics, that modern English architecture was incapable of rising above Gothic and Elizabethan. We have too few of Cockerell's works, and this one may be looked on as his most important monumental work in London. His London and Westminster Bank in Lothbury, and his Sun Fire Office in Threadneedle-street, belong to trading companies who may have built on leasehold land, so that his buildings may at any time be spoiled by alteration, or be altogether destroyed. This is not a fanciful objection, as Sir John Soane's beautiful block called "Bank Buildings" has been spoiled by alterations. Hanover Chapel was consecrated in 1825, and was illustrated by Britton and Pugin in their "Public Buildings of London," where they say, "We cannot recommend this interior more strongly than by stating that it has frequently been compared with that of St. Stephen's, Wallbrook, one of Sir C. Wren's most admired works. The style throughout is, indeed, of a noble character." It should not be overlooked that if the legislature were to allow parochial authorities, as destitute of taste or feeling as those concerned with Hanover Chapel, to destroy our monuments, St. Paul's Cathedral or Westminster Abbey would be pulled down, if a large income could be got from letting their sites.

150, *Harley-street, W.* G. AITCHISON.
Feb. 26, 1891.

The Student's Column.

VENTILATION AND WARMING.—IX.

WÖLPERTS FORMULA AND ITS APPLICATION.

WÖLPERT'S formula for the velocity of moving air by reason of the difference of temperature, at which we arrived in our last chapter, is a specialised form of the universal expression (20) which we found for the movement of fluids in general. Wölpert's formula is simple, and easily remembered, and, therefore, enjoys considerable popularity. Its simplicity, however, is obtained, as we have seen, only by ignoring certain considerations, therefore it is only in simple cases that it can give results which will hold good in practice. It is plainly evident that the whole of that part of the formula under the radical sign gives simply the theoretical velocity, whilst the working velocity, which often widely differs from this, is obtained by sheer multiplication with a coefficient c, which in itself admits of a very wide margin of variation in special cases.

For calculations, which are to be reliable and accurate, we must not shirk the trouble of taking into account all the resistances from friction and other causes, as is the case when our universal expression (20) is employed.

Thus the form of the air ducts, and their section on which the value of $max. \frac{A}{s^2}$ depends, determines to a certain extent in every case the value which Wölpert's formula possesses. The method of separately investigating the loss of power by reason of the form of the air-channels, or flues, we shall hereafter examine.

We will now consider how in various cases the data for the application of our formulæ are to be obtained.

Let us first assume in fig. 5 the cross section of a room to be represented by A B, and that in the outer wall there exist two openings, a near the floor, and c near the ceiling, also that the

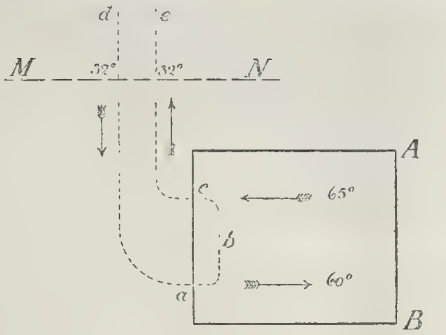


Fig. 5.

xternal temperature is at 32 deg. Fahr., the nternal 60 deg. near the floor, and 65 deg. near he ceiling. Then, as long as these conditions xist, a circulation of air will be maintained, he inlet being at *a* and the outlet at *c*. The utgoing air will ascend as a column of warm ir until it loses so much of its heat as to fall o the temperature of the external atmosphere, vhich we will suppose to occur at the level of M N. As the two columns of air are of the ame temperature at M N, they are therefore ere of the same specific weight, and we may all M N the limit of equal specific weight.

The inlet *a* is acted upon by the weight of he column of air *a d*, of the temperature 32 deg.; n the other side of *a* is a column of air *b*, of a emperature ranging from from 60 to 65 deg., nd also the column *c e*, of a temperature anging from 65 to 32 deg. As M N is the imit of equal specific weight, it is only up to his that there is any difference of temperature r of specific weight, and this therefore also narks the limit of height of the operative olumns.

The greater weight of the column of air from M N to *a* occasions a difference of pressure vhich raises the column *a c*. If the external tmosphere were perfectly still, the warm olumn of air from *c* to M N would influence the esult. As, however, the height of M N is ifficult to determine, the efficiency of the varm column small and rapidly diminish-ng and with any movement of the external tmosphere practically nil, the height *a c* of he internal column is alone taken into ccount.

The mean temperature of the internal olumn is $\frac{60 + 65}{2} = 62{\cdot}5°$. This, therefore, we ake as the temperature of our warm-air olumn, and 32 deg. as that of the cold-air olumn, and the motive force is the difference weight of these two columns of different emperatures.

If we consider the openings *a* and *c* brought oser together and finally united, the two reams of incoming and outgoing air will be the same opening. The upper part of the pening will form the outlet, the lower the in-t. Both will be of the same size, and the agnitude of *b* in our diagram will be the istance betwen their middle points. This xplains the action of the air change which oes on through open doors and windows in ur everyday experience.

Let us now consider another case. Here in g. 6 we have a room B warmed by a heating pparatus A at a lower level. The fresh air nters at *b*, passes along the horizontal channel *c*, is warmed by the apparatus A, and rises to he room B by the duct *d e*. After passing hrough and warming the room, the air is arried off by the flue *f g*, and finally becomes ooled to the temperature of the external mosphere at the limit of equal specific weight N. We may then consider the whole course the air current *a b c d e f g h* as a continous be or channel, in which the left hand part *b* contains the cold air, whose weight ressing upon the warm part raises the column *d e f g h* and thus maintains a constant supply warm, fresh air.

In this instance we see an example of the nnexion of ventilation and warming. In rder to determine the velocity of our ventilating rrent of warm air, we must take into con-ideration the efficiency of the heating appa-ratus, while this conversely must be regulated by the amount of ventilation which it is desired to introduce into the room B.

Inasmuch, also, as the height, *g h*, is in this case, as in the last, difficult of determination, and should not, therefore, be taken into account, it is only by taking into consideration the cooling effect of the channels through which the column of heated air passes that we can

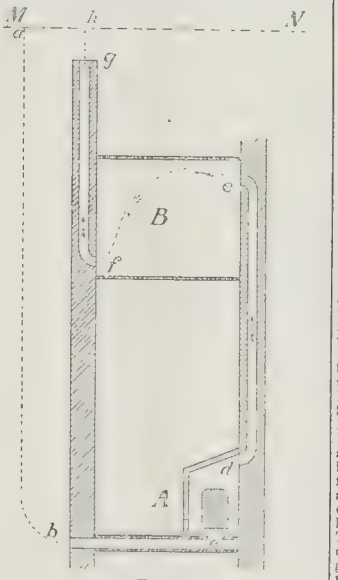


Fig. 6.

determine with any approach to accuracy the temperature of the warm air at the point *g*, or at any other point, and so arrive at the mean temperature of the warm-air column, and thus obtain the data necessary to enable us to make use of our formulæ. This is part of the subject of warming, and will therefore have to be considered before any practical use can be made of the theory of ventilation.

COMPETITIONS.

Dewsbury Proposed Free Library, Public Baths, &c.—The Town Council have appointed Mr. Edmund Kirby, F.R.I.B.A., of Liverpool, to be the assessor in this competition.

Bridge of Weir United Presbyterian Church.—The design of the new church which it is proposed to build here has just been selected. The design has been selected from competitive plans, and the successful competitor is Mr. J. B. Wilson, A.R.I.B.A., Glasgow. It is estimated that the total cost of the church will be about 2,500*l.*

Roman Fibulæ.—The *Antiquary* for March contains an article by the Rev. J. C. Cox, on a recent find of Roman fibulæ near Buxton, with several illustrations of the objects found.

SURVEYORSHIPS.

Bilston.—A special meeting of the Township Commissioners was held at the Town-hall, Bilston, on the 26th ult., when Mr. C. L. W. Wilson, of Bacup, was appointed Surveyor, at a salary of 150*l.* per annum. There were fifty-one applicants.

Hammersmith.—At the fortnighly meeting of the Hammersmith Vestry, on the 25th ult., it was agreed that the salary of Mr. H. Mair, Surveyor, be increased from 400*l.* to 500*l.*

Stroud.—On the 2nd inst., at an adjourned special meeting of the Local Board, Stroud, Mr. George Percival Milnes, of Wakefield, was appointed Town Surveyor. There were 87 applications. The salary is 150*l.*

OBITUARY.

Alderman Sir Thomas Gabriel, who died last week, at the age of eighty, was formerly well known in the building trade. His father, according to the *City Press*, was the son of Mr. Thomas Gabriel, of Brixton, who was the son of the founder of the firm of Thomas Gabriel & Sons, timber merchants. Sir Thomas was Lord Mayor of London in 1866–67.

Mr. Andrew Currie.—Mr. Andrew Currie, sculptor, died suddenly on the 23th ult. The deceased, who was bordering on eighty years of age, formerly lived at Darnick, near Melrose, but he removed to Edinburgh about two years ago. The *Scotsman* says that as a sculptor he took a high place, and his head and hands conceived and chiselled some of the fine representations in stone of Scott's genius which now adorns Scott's Monument in Edinburgh.

GENERAL BUILDING NEWS.

The New Royal Observatory, Edinburgh.—The plans prepared by her Majesty's Office of Works for the new Royal Observatory to be erected on Blackford-hill, Edinburgh, have been approved of, and building operations will be commenced as soon as practicable. The building will be an imposing structure, having two domes, and will depend more upon mass than detail for effect. Various sites were suggested for the new observatory, and the one selected was chosen as being most free from the city smoke. Blackford-hill is situated almost due south from the Castle, from which it is distant upwards of a mile. It has been acquired as a public park, and already new villas begin to gather around its base. The present Royal Observatory, on the Calton-hill, has been conveyed by Government to the city authorities; it is inadequate to contain the magnificent set of astronomical instruments gifted to the nation by the Earl of Crawford, and the site was not only too restricted for the requirements of the new observatory, but is objectionable in other respects.

Day Industrial Schools, Liverpool.—Last Saturday the Liverpool Architectural Society, at the invitation of their president, Mr. T. Mellard Reade, F.R.I.B.A., visited the new Day Industrial Schools just erected in Addison-street and Sawney Pope-street, Marybone, by the Liverpool School Boards at a cost of about 10,000*l.*, from his designs and under his superintendence. This is the second institution of the kind erected in Liverpool, and it follows the same general arrangements as that adopted by Mr. Mellard Reade in the first one erected in Queensland-street, and which is said to have served for a model to other cities and towns. The new buildings are for the reception of children committed to them by the magistrates upon the ground that their parents have habitually neglected to provide them elementary education. The boys and girls enter through their respective playgrounds. A reception-room is provided for the examination of new comers. Off this room is a bath-room, with a disinfecting closet for purifying clothes. After this ordeal, the boy or girl, as may be, is admitted into the school. There is a schoolroom for 100, two class-rooms for forty each, and a kindergarten class-room for sixty, all supplied with Bennett's dual desks, sliding glass screens enabling two class-rooms to be thrown into the schoolroom for joint teaching. The dining-room is 36 ft. square, and fitted-up with specially-made tables and benches for dining 240 children. The kitchen, scullery, and pantry adjoin the dining-room. On the opposite side of the basement staircase is the wash-house and drying-room. The drying-stoves are of Bradford's manufacture. Lavatories, with fifty basins for the boys and twenty-six for the girls, are arranged near the playground entrances. A workshop, spacious and well-lighted, is approached from the boys' playground. In the basement under the schoolroom is the boys' swimming-bath, 24 ft. by 16 ft.; and also a girls' plunge-bath, 16 ft. by 11 ft., separate from each other, and supplied with hot water from a large iron tank, heated by steam. Under the class-rooms is the drill-room, 63 ft. by 25 ft.

Police-Station Buildings, Leek.—The contract for a new county police-station, to be built at Leek, Staffordshire, has been taken by Mr. Thomas Grace, of Leek, the architects being Messrs. W. Sugden & Son, also of Leek. The new station is planned for one superintendent, one single sergeant,

one married sergeant, and twelve police-constables, with cells and stable buildings. The walls will be of local brick, West's thin-pressed being used for the interior, and Wall Grange common bricks internally. The stone dressings will be of hard yellow Sheen stone, and the roofs will be covered with purple Broseley tiles. The principal ground-floors will be paved with parquet wood blocks. The parade-yard will be laid with Stansfield's mosaic granite asphalte. The cells and their approaches will be laid with foreign asphalte, and faced internally, and vaulted over, with light-glazed bricks. The heating will be by Haden's low-pressure hot-water system.

EXTENSION OF THE HAYWOOD HOSPITAL, BURSLEM.—The opening of two new wards which have been added to the hospital erected in Moorland-road, Burslem, took place on the 18th ult. The wards have been erected by raising the central portion of the building another story. The original accommodation of nine beds has been increased to seventeen. Messrs. Ford & Slater, of Burslem, who were the architects of the original building, have supplied the plans. Mr. N. Bennett, of Burslem, was the builder.

NEW SCHOOL BUILDINGS, HUDDERSFIELD.—On the 21st ult., the foundation-stone of a new Sunday school in connexion with Mold-green Congregational Church was laid by Mr. Edward Day, of Hillhouse. The new building is being erected at the rear of the chapel, and the total cost will be about 2,000*l.* The architect is Mr. W. Cooper, of Huddersfield.

NEW THEATRE FOR BARRY AND CADOXTON.—A new theatre of varieties is being erected in Main-street, Cadoxton. The total seating accommodation will be for about 2,500 persons. The walls are being ornamented with Lincrusta-Walton decorations. The stage is about 53 ft. wide and is 25 ft. in depth, and the height of the building is about 50 ft. There will be band accommodation for twelve or fourteen musicians, and dressing-rooms will be constructed under the stage, and fitted with lavatory conveniences. There are three principal entrances to the theatre, and two additional exits. The building is constructed of Bristol bricks, with an ornamental front in stone. Messrs. Richards & Gethin, of Cardiff, are the architects.

RESTORATION OF BLADON CHURCH, OXFORD.—It is stated that the church of St. Martin's, Bladon, will be restored at an estimated cost of 2,200*l.* The rebuilding of the chancel will cost between 800*l.* and 900*l.* The building of the nave and tower and reseating of the church, at a cost of 1,257*l.* will be continued later on. Plans of the new church have been prepared by the architect, Sir Arthur Blomfield.

NEW CHURCH OF ST. MATTHIAS, LINCOLN.—The new church, dedicated to St. Matthias, situate at the Burton-road end of Willson's-crescent, Lincoln, was opened on the 24th ult. The church consists of a nave with aisles, and a chancel with a vestry opening into it, while a similar chamber, for an organ, is placed opposite to it. There is a south porch, and a timber framed spire is placed at the west end. The walls are constructed of stone from quarries belonging to the Dean and Chapter. The seats are open benches, and there is accommodation space provided for 437 worshippers. The passages are paved with red and black tiles, and the windows are filled with cathedral glass. The font has been presented by the Bishop of Lincoln. The arches and pillars which divide the nave from the aisles are of solid timber. The length of the building is 102 ft., with a breadth of 54 ft. The style is that of the thirteenth century. The windows are lancets, but the west front is provided with two traceried windows. The entire cost has been under 2,000*l.* The work has been executed by Messrs. Wright & Sons, builders, of Lincoln, under the superintendence of the architect, Mr. E. P. Loftus Brock, F.S.A., of London.

NEW CHAMBERS IN PORTLAND-PLACE.—On the site of Langham House, Portland-place, which was pulled down in the spring of last year, and of its front garden, a block of chambers,—in red brick, with stone dressings,—is now being built, from the designs of Mr. R. J. Worley, architect, by Messrs. Perry & Co., contractors. Of the later Langham House we gave a short account, in a "Note," on January 25, last year: the property was sold at auction for 14,000*l.*

WHITELANDS COLLEGE, CHELSEA.—An extension of Whitelands College, Chelsea, was opened on the 3rd inst. by the Lord Mayor, the Bishop of London presiding at the meeting. The principal features of the new building consist of, on the first floor, a large recreation-room, 55 ft. by 25 ft., a pantry for the dining-hall and a room for the lady superintendent; on two floors above are dormitories, bath-room, &c.; on the ground floor, a spacious entrance and hall intended more especially for visitors, three sitting-rooms, a class-room, linen-room, stores, and students' kitchen, with a new side entrance for the use of the students. The basement is occupied by lavatories, cloak and box-rooms, and a large main staircase runs from top to bottom of the building communicating with all the floors, and corresponding to a similar one at the other end of the college; in addition a separate staircase is provided from the entrance-hall to the recreation-room for the use of visitors. The iron Queen-Anne entrance-gate is an old one, carefully repaired and re-fixed. Stock bricks were used with Portland stone dressings. The new building corresponds in style with the rest of the college, and is to be lighted by electricity. The work has been completed in about seven months, at a cost of under 4,000*l.*, by the builders, Messrs. Holt & Sons, from designs prepared by Mr. C. Pemberton Leach, architect.

ARTISANS' DWELLINGS IN BIRMINGHAM.—At a special meeting of the Birmingham City Council, held on the 25th ult., a resolution was adopted approving the erection on the improvement area of eighty-two artisans' dwellings, at a cost of 14,000*l.* Under the scheme, seventy-five dilapidated houses will be removed, and modern dwellings substituted.

SANITARY AND ENGINEERING NEWS.

DRAINAGE OF CAPE TOWN.—Mr. Clement Dunscombe, formerly Borough Engineer of Liverpool, and who was appointed Engineer to the London County Council and had to relinquish the post through ill health, has now settled in London, having fully recovered his health after a period of rest, and has been selected by the Cape Government to prepare a comprehensive scheme for the drainage of the City of Cape Town, South Africa, and the disposal of its sewage. Mr. Dunscombe left for the Cape a few days ago, and expects to return to England in May next.

LONDON SANITARY PROTECTION ASSOCIATION.—The tenth annual general meeting of this Association was held on Monday last, the 2nd inst., at the rooms of the Society of Arts, under the presidency of Lord Chelmsford. From the report of the Council it appeared that 499 new members had joined during the year, and, deducting 418 who had withdrawn, there was an increase of 81. The number of houses inspected for the first time during the year was 490, thus bringing up the total number inspected by the Association from its commencement in 1881 to 4,116. Amongst the inspections made for the first time were 21 of buildings occupied as clubs, schools, and other institutions in town, and 46 of country houses. A number of those inspected in previous years had been again inspected. The special inspections numbered 457, as compared with 439 in 1889. These were inspections of work during progress or to inquire into reported defects, and they denoted the continuance of an interest on the part of members in the sanitary requirements of their houses, and had been attended with the very best results in securing better and more carefully executed work. The water test for the detection of faulty construction and bad jointing of drains, had been applied in almost every case, and the Council specially called attention to the extreme importance of applying this test in order to ascertain whether there was any escape of sewage into the soil beneath the house. The increase in inspection work had rendered it necessary for the Council to appoint another engineer on the permanent staff, which now consists of six resident inspecting engineers. The articles of association had been amended, reducing the fees and subscriptions for buildings in town, the rent of which did not exceed 100*l.* a year. The report was adopted.

LITTLE COMMON SEWERAGE.—The Bexhill Local Board has appointed Mr. H. Bertram Nichols, C.E., of Birmingham, who in 1886 successfully carried out the main sewerage scheme for Bexhill-on-Sea, Consulting Engineer for the Little Common Sewerage and Sewage Disposal, and for the Church Hill Improvement Scheme, and Mr. Nichols has received instructions to prepare the plans and report at the next meeting of the authority.

STAINED GLASS AND DECORATION.

STAINED GLASS WINDOW, ST. STEPHEN'S CHURCH, WILLENHALL.—A stained glass window has been placed in St. Stephen's Church, Willenhall, in memory of the late Mr. William Parker. It illustrates the two parables of "The Good Samaritan," and "The Talents," and consists of two lights. The work has been carried out by Mr. Samuel Evans, of West Smethwick.

DEDICATION OF MEMORIAL WINDOW, ANNESLEY CHURCH.—On the 21st ult., in All Saints' Church, Annesley, the Bishop Suffragan of Derby dedicated a stained-glass window in memory of the late Rev. Clement Howard Prance, M.A. The window is at the east end of the church, and erected over the altar-table. The cost of it will be about 400*l.* The work has been carried out by Messrs. Powell Bros., of London.

DECORATION OF CHANCEL, ST. JOHN'S CHURCH, BURSCOUGH BRIDGE, LANCASHIRE.—The new chancel of St. John's, Burscough Bridge, erected about a year ago, has been re-opened, having been in the hands of the decorators. Instead of the plaster walls, decorated surfaces are now presented. The ceiling has been treated in turquoise blue, upon which designs, mainly in vellum and gold, are portrayed. The walls are chiefly in red tones, with smaller quantities of deep turquoise tones, vellum and gold. They are divided into various spaces by ornamental bands, some of which are diapered with ornamentation. The panels of the choir stalls have been decorated as mediæval drapery, treated in tones of greenish blue and gold. The works have been done by Messrs. G. H. Morton & Son, of Liverpool, from designs and under the direction of Mr. G. H. Morton, jun.

FOREIGN AND COLONIAL.

FRANCE.—The Minister of Public Works has asked for a vote of 200,000 francs for the execution of various necessary works of restoration at the palace of Versailles and at the Petit Trianon. The general opinion is that this sum is quite insufficient for the purpose.——Some Celtic axes have been discovered on an estate in the commune of Gonfréville-l'Orcher (Lower Seine); the third discovery of the kind that has been made at this place.——A rich collector of Arras has left to the Louvre a splendid Byzantine ivory in the form of a triptych adorned with carvings of sacred subjects, apparently of the tenth century.——M. Henry Jouin, art-critic, who is attached to the Direction des Beaux-Arts, has been appointed perpetual secretary of the École National des Beaux-Arts, in place of the late Albert Lenoir.——M. Munkacsy, who has adopted Paris as his home, has been commissioned by the Austrian Government to paint a great picture for the decoration of the Salle des Séances in the new Parliament House at Pesth, at a cost of 200,000 francs.——It is announced that the heirs of George Sand are about to parcel out for sale the celebrated property of Nohant, which was her favourite and habitual residence and of which she has given numerous descriptions in her works.——M. Georges Berger has been named President of the Union Centrale des Arts Decoratifs, in place of M. Antonin Proust resigned.——The Chamber of Deputies voted a few days since the sum asked for by the Government for the excavations at Delphi which are to be undertaken under the direction of the French School at Athens.——The competition opened by the *Encyclopédie d'Architecture* has been decided. Five designs were sent in, and four competitors have been premiated. The first prize went to M. Léon Vincent of Paris for his design for a "Salle de jeu et Salle de billard annexées à une grande habitation." The second prize was given to M. P. Gout (Paris) for a school in connection with the new "Lycée Racine" in the Rue de Rome; the third to M. Louzier (Paris), for a design for a church. The competition remains open, no date of closure having been yet fixed.——There were discovered a little while since, in a room in the Hôtel de l'Imprimerie Nationale, some decorative paintings which had ornamented the study of Cardinal de Rohan. The panels, which are in good preservation and had been hidden behind a book-case, are admirable specimens of eighteenth-century work.——There has been a sale at the Hôtel Drouot of the pictures and sketches of the painter Toulmonche, as well as the collection of Burly the art critic. The sketches found in the atelier of the eminent painter Eugène Lami have also been sold; and the military painter Julien de Blant has had a sale of the drawings made by him in illustration of Balzac's remarkable romance, "Les Chouans."——The works required for the enlargement of the Gare de l'Est have been commenced. The new buildings, of which the main portion will be finished at the close of the year, will occupy a site bounded by the Rue de Metz, Rue de Nancy, and the Faubourg St. Martin.——The Municipal Council of Avignon has voted the removal of the statue of Crillon from the Place de la Republique in front of the theatre, to make way for a monument in honour of the centenary of 1789. The statue was a very poor one by a Provençal sculptor erected in 1858; but the proposal has given rise to a violent dispute, and occasioned the strongest protestations in the department.——The death is announced of M. Frederic de Reiset, Honorary Director of national museums, who was a distinguished collector.

TELEPHONE BETWEEN CHRISTIANIA AND STOCKHOLM.—The capitals of Sweden and Norway will shortly be connected by telephone. The junction of the telephone system of the two countries will be effected at Maguro, on the central frontier, through the lines Orebro—Maguro, in Sweden, and Christiania—Maguro, Norway. The cost of the connection will be about 10,000*l.*

A MEMORIAL TO LADY DUFFERIN.—The bust of Lady Dufferin and Ava, by the late Sir Edgar Boehm, has arrived in Calcutta, and is now at the rooms of the Chamber of Commerce. It is to be placed in the new Zenana Hospital, Calcutta, at the double ceremony of unveiling it and of opening the main block of the hospital is likely to be performed by Lady Lansdowne about the middle of next month.—*Indian Engineering.*

PRUSSIAN GOVERNMENT RAILWAYS.—The Prussian "Landtag" intends voting 145,537,500 marks, or nearly 7,275,000*l.*, for purposes of the Government Railways. Of this sum 36,000,000 marks will be required for the construction of new lines, 26,000,000 for the extension of lines already working,

29,000,000 for building purposes and alterations on these lines. It may be well to note that the Government has lately spent some 5,000,000 marks for the adoption of continuous breaks on 1,427 locomotives and 7,355 carriages.

DARMSTADT.—A new building is to be erected for the Royal Technical College. The Grand Duke has given a site of some 2,000 square mètres, and on the central position of this site will be placed the college building proper (90 mètres frontage), flanked on either side by separate buildings for the electro-physical and technological-chemical divisions. The cost of the new building, arranged to accommodate some 500 students, is estimated at 1,531,000 marks.—*Deutsche Bauzeitung.*

BERLIN BUILDING LEGISLATION.—The private architects of Berlin, headed by the *Vereinigung Berliner Architekten,* have put a petition before the police authorities of the city, begging for certain alterations in the code of Berlin Building Laws, and especially for better arrangements regarding an equal and fair enforcement of the same. The Building Regulations, exceedingly stringent, and in many cases unpractical in themselves, are not being found fault with so much at present as the way in which paragraphs of the code are continually being read and construed differently by those in charge of the different quarters of the town, whereby confusion is caused for the architects whose designs may pass in one district and not in another. As we have stated in a prior number, the Building Regulations are to be altered, but several years will elapse before they can be passed and come in force; the present petition strives for provisionary advantages to last till this remodelling is complete.

NEW BERLIN THEATRES.—Among the numerous schemes for the erection of new places of public amusement, most of which are not likely to be carried out, there is one for a new Opera House for the Potsdamer quarter of the city, one for a new theatre for the production of classic plays, and another for the production of popular patriotic pieces, three designs for which are at present before the authorities for approval. These, if well managed, are fairly sure to prove successful, the old Royal Opera House having at the time but a poor reputation in many respects, a new classic theatre being a requirement, and a theatre for popular plays—a "Volkstheater"—designed to hold some 3,000 people on places priced as cheaply as possible, being a long-felt need. Up to date, Berlin with its 1,500,000 inhabitants has one opera house only (an opera comique), seven first-class, and five second-class theatres, and three better-class variety theatres at which entertainments are given every evening; and of all these only one, from the architect's point of view,—the Lessing Theatre,—can be deemed to fulfil all modern requirements.

HAMBURG BUILDING REGULATIONS. — In the code of building laws used in the old Hanse State, Hamburg, where a direct permission to build is not required, we find provisions to the effect that faults in the design of a building are to be put to the account of the architect who has drawn out the plans and sections, whilst the contractor is to have the entire responsibility of the erection, and such accidents as may happen during the erection. For the purpose of preventing unqualified persons taking upon themselves the above responsibilities the police authorities have the right of prohibiting the erection of a building by a person whom they do not consider competent, or according to designs of a person whose ability they have reason to distrust.

CAWNPORE WATER-WORKS AND DRAINAGE.—In connection with the Cawnpore water-works and drainage scheme, it is understood that a conference between the Lieutenant-Governor, Mr. Baldwin Latham, Mr. Hughes, and the Collector, has resulted in its being decided that the sewerage of the city should be carried in a covered main from the Susaman Nullah to a point on the Ganges below Cawnpore, the course to be by the side of the road which runs parallel with, and at a distance varying from a quarter to half a mile from, the river. Further, that a site for the pumping station has been selected above Old Cawnpore, arrangements being made for a connexion with a canal by a *rajbaric* as a resource to fall back upon in the event of a possible failure of the supply of water owing to an abnormal fall of the Ganges.—*Indian Engineer.*

PROPOSED LABOUR EXHIBITION.—We understand that the tender of Mr. J. Charlton Humphreys for the erection of Iron Buildings for this Exhibition, has been accepted. The Corporation of the City of London has granted the use of the Guildhall to the Committee of the Exhibition for their meetings.

OIL LAMPS FOR BATH HEATING. — We have received from the maker, Mr. G. Shrewsbury, a prospectus and illustrations of the "Eclipse" Oil Bath Heater, in which oil lamps with sheet-iron chimneys are placed on an iron shelf under a ten or fifteen gallon container. It is intended for use where gas is not available.

MISCELLANEOUS.

THE STRIKE AT MESSRS. DOULTON'S POTTERIES.—Sir Henry Doulton writes to us, just as we are going to press, informing us, in reference to the recent strike of the "throwers" employed at the Lambeth works, which commenced on December 2 last, that after an interval of twelve weeks the workmen have unconditionally requested to be reinstated in their former positions, and have formally acknowledged the failure of their demands. The attempt to limit the proportion of learners to one youth for every seven journeymen is one which Sir Henry regarded as tyrannous to an employer and fatal to the progress of the manufacture. He therefore felt bound to resist it at any cost. We have no space for Sir Henry's letter *in extenso:* it reached us too late.

THE SURVEYORS' AND AUCTIONEERS' CLERKS' PROVIDENT ASSOCIATION.—In the annual report of the Committee of Management of this Association for the year 1890, presented at the annual meeting held on Wednesday last at the Auction Mart, the Committee record another year of steady usefulness, and congratulate the members upon the continued financial progress of the Association. The benefit membership has increased only nominally. Two deaths have occurred, but no claim on the Life Assurance Fund arose in respect of either member. A heavier call than usual on the Sick Allowance Fund took place at the beginning of the year, but the sum of 200*l.* has, notwithstanding, been added to the Reserve Fund, which now amounts, at cost price of investment, to 2,312*l.* 16s. 3d. The interest therefrom again provided for all management expenses, and left a small surplus. The Committee express the gratification of knowing that the Benevolent Fund of the Association is a means of very considerable usefulness. Two applications for assistance were received. Special procedure is followed in awarding these grants, so as to secure that no irregular claim is passed. While, however, the establishment of such a fund is a great advantages and would, they say, alone justify the existence of the Association, the Committee earnestly desire to see a very considerable increase in the membership of the other funds. They again appeal to employers and employed to second their efforts in this direction. Mr. Daniel Watney is the President of the Association.

ARTISANS' DWELLINGS. — We have received in a pamphlet form a copy of the paper on this subject read by Mr. Francis Hooper at the Sanitary Congress at Brighton last year; a very practical paper, and containing some well-arranged plans for dwellings of this class in flats. We are inclined to think, however, that the erection of these many-storied buildings for the poorer classes is likely, from a sanitary point of view, to come more and more into disfavour. The medical profession are adopting a decidedly hostile attitude towards them.

PUBLIC IMPROVEMENTS AT BRADFORD. — At Bradford, on the 25th ult., the proposed additional borrowing powers of 420,000*l.* for various improvements, &c., formed the subject of a Local Government inquiry by Mr. Thomas Codrington, C.E. The inquiry was held in the Council Chamber.

The Town Clerk (Mr. W. T. McGowen) stated the case for the Corporation, setting forth the purposes for which the loan was required. It appeared that under the Local Act of 1873 a sum of 100,000*l.* was needed; for the Great Horton-road and Little Horton-lane improvements a sum of 60,000*l.*; improvements under the Act of 1886, 150,000; improvements under the Act of 1889, 80,000*l.*; and sewerage works, 30,000*l.*; making a total of 420,000*l.* Details were then gone into, and opposition to the granting of the money having been made, the Borough Accountant prepared statistics relating to the matter, and the inquiry closed.

THE LONDON CONFERENCE ON THE HOUSING OF THE WORKING CLASSES ACT.—The special committee on defects in houses appointed to prepare for the consideration of this conference (convened by the Paddington Vestry in February) a list or schedule of the conditions or defects which may be considered to render a house "so dangerous or injurious to health as to be unfit for human habitation" within the meaning of the Housing of the Working Classes Act, and consisting of Dr. G. P. Bate, Medical Officer of Health, Bethnal Green; Mr. Thomas Bridger, Vestry Clerk, Hampstead; Mr. J. H. Clews, representative of Poplar District Board of Works; Mr. George Coker, representative of Mile End Old Town Vestry; Mr. William Davies, representative of Battersea Vestry; Dr. T. Orme Dudfield, Medical Officer of Health, Kensington; Rev. J. W. Horsley, representative of Woolwich Local Board; Mr. Mark H. Judge, representative of Paddington Vestry; Mr. T. Martindill, representative of Hammersmith Vestry; Mr. W. R. Putterill, representative of Clerkenwell Vestry; Dr. Walter Smith, representative of St. Pancras Vestry; Mr. J. E. Smith, Vestry Clerk, Westminster (St. Margaret and St. John); Mr. Frank W. Truman, representative of St. George-the-Martyr Vestry, Southwark; Dr. F. P. Wightwick, Medical Officer of Health, St. Olave, Southwark; Mr. J. Winfield, representative of Shoreditch Vestry; Mr. H. J. Wright, representative of Chelsea Vestry; and Dr. W. Wynn-Westcott, representative of Islington Vestry; held their first meeting on Tuesday last. On the motion of Mr. Judge, Dr. Orme Dudfield was elected Chairman of the Committee. The Committee sat for nearly three hours, and nearly completed their draft report, which will be finally revised at a meeting to be held on Monday next, so as to be ready for the next meeting of the Conference, which is fixed for Friday, March 13, when several additional vestries and district boards will be represented.

LOFTY "MODEL" DWELLINGS. — These large buildings are exceedingly unfavourable for the exercise of their inmates, more especially of the women and children, who are their more permanent residents. It is, even to fairly strong persons, a great labour to climb up and down long flights of stone steps, and this, even if time were not an important consideration, would deter most persons of poor physique from attempting it more frequently than was absolutely necessary, and the strain on the hearts of poorly-fed persons would be distressing, and sometimes injurious; but it is sheer cruelty to set small children with their short legs to climb up and down steps which are constructed for adults. We have only to watch the children ascending these stairs to see what contortions of the body and limbs are necessary to enable them to climb them, and the risk of accidents when they play on the steps and landings is very great. Children living in the higher stories must suffer seriously from this impediment to their play, as few mothers would allow their young children to go so far from their sight and hearing, and could rarely find time to accompany them to the playground. The physical development of a child is very much in proportion to its physical vivacity, and its stuntedness to its physical passivity, and high houses are therefore a serious menace to the good physique and health of the rising generation. — Mr. C. Roberts, in "*Physique.*"

THE ENGLISH IRON TRADE.—The English iron market pursues the even tenour of its way; that is to say, it remains quiet, with a very slender prospect of matters improving at an early date. The warrant market has again been inanimate, and the business done in pig-iron of moderate scope. Crude iron remains steady in the North of England and Scotland, but weak in Lancashire and the Midlands. Bessemer pig is exceptionally quiet, and 1s. a ton lower in the North-west, trade in steel being slow, and the orders placed of small dimensions. There is not much life in the finished iron business, and prices are weaker. Black sheets, probably owing to the disorganisation in the trade, have dropped another 2s. 6d. Tinplates are quiet, but strong. In the ship-building trade, it is observable that the new orders received do not nearly reach the tonnage launched. There is greater competition for engineering work.—*Iron.*

TECHNICAL EDUCATION AND REGISTRATION OF PLUMBERS.—A number of applicants for registration by the Worshipful Company of Plumbers, under the rules of the national registration system, were examined at the Guild's Institute, on Saturday last. Applicants were present from Suffolk, Norfolk, and Kent, as well as from most parts of London and the suburbs. The examinations, while not unduly severe, were, says the *Times,* such as to test thoroughly the manual skill and theoretical knowledge of the candidates, each of whom, in addition to executing such practical work as lead-laying, pipe-bending, joint-making, &c., was required to answer a set of questions relating to the properties and qualities of the various materials used by plumbers in their work, external and internal construction, and sanitary arrangements and water supply. The examiners were Messrs. Charles Hudson, W. H. Webb, George Taylor, C. T. Millis, H. B. Lobb, and R. A. Nurse, the last representing the United Operative Plumbers' Association of Great Britain and Ireland. Only one-fifth of the candidates succeeded in passing the full examinations. —— A public meeting of master and operative plumbers, and all interested in sanitation and good plumbing, was held on Monday night in the Waterloo-rooms, Glasgow. Councillor Crawford, chairman of the Health Committee of the city, presided, and among the other gentlemen on the platform were Councillor Simons, Drs. Glaister and Munro, and Eben. Duncan; Mr. Buchan, Mr. Stevenson, Mr. James Anderson, Mr. John Honeyman, architect; Mr. A. M. Scott, secretary of the District Council, &c. A resolution approving of the work of the Plumbers' Company in promoting the technical education and registration of plumbers was agreed to. —— Dr. Chas. Harrison, Medical Officer of Health, presided at a public meeting held recently in the School of Science and Art, Lincoln, under the auspices of the Lincoln District Council for the National Registration of Plumbers, for the purpose of forming a plumbers' class with a view to giving instruction in the theory and practice of the plumbers' craft. Among those present were Mr. W. Watkins (ex-Mayor), Vice-Chairman; Mr. G. J. Dashper (Clerk of the Peace), Secretary to the District Council; Mr. E. F. Arnold, Mr. T. Pilkington, Mr. Boocock, Mr. A. Wright, and a number of master and operative plumbers. A resolution affirming the desirability of forming a class for plumbers was carried, and, subsequently, the ex-Mayor read a paper on "The Air we Breathe, and its Relation to Domestic Sanitation."

CONTRACTS, AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Iron Fencing	Hendon Local Board..	S. S. Grimley	Mar. 9
*Removal of House Refuse	St. Pancras Vestry ..	*Official*	do.
*Main Drainage Extension Works	West Ham Council....	Lewis Angell	Mar. 10
Three Cottages, Clydach Vale	.....	R. S. Griffiths	do.
Stabling, Newton Heath	Manchester Corp.	*Official*	do.
Boundary Wall, Buildings, Fatricroft	Barton-upon-Irwell Union	Manguall & Littlewoods	do.
*Construction of Reservoir	Windermere Gas and Water Co.	J. Newton & Son	Mar. 11
*Roadmaking and Paving Works	Hammersmith Vestry	H. Maie	do.
Stone Quay, Lancaster	Lancaster Comms. ..	D. & T. Stevenson	do.
Retort House	Guildford Gas Co. ..	*Official*	do.
Ten Through Houses, Elford-grove, Leeds	Leeds Indus. Co-op. Soc. Ltd.	W. S. Braithwaite	do.
Road Works	Cardiff Town Council	W. Harpur	do.
Timber, Ironwork, &c.	Southampton Har. Bd.	*Official*	do.
Additions, &c. Norbigate House, Darlington	Owner	.....	do.
*Paving Works	Barking Town Loc. Bd.	C. J. Dawson	Mar. 12
60 Four-roomed Cottages, Wynn-on-Type	Clara Vale Colliery ..	.....	do.
Road Metal, Kerbing, &c.	Plymouth Corp.	G. D. Bellamy	do.
New Bridge and Incidental Road Work, Lytteh	Banff County Road Board	Robt. Davidson	do.
Fifty six Cottages, Clydach Vale	Caubrian Build'g Soc.	R. S. Griffiths	do.
Kerbing and Road Metal	Warrington Twn Coun	T. Longdin	do.
Cast Iron Pipe, Stop Cocks, Lead Piping, &c.	Leeds Corporation....	*Official*	do.
Brass Boiler Tubes, Iron Panel Plates, &c.	East Indian Ry. Co....	do.	do.
*Excavating and Levelling Earthworks..	War Department	do.	Mar. 13
Broken Granite (4,500 tons), Road Works, &c.	Rutland C. C.	do.	do.
Road Works	Cricklade High. Bd.	John Knapp	do.
Re-building Three Bridges	Durham C. C.	Wm. Crozier	Mar. 14
Iron Water Tank, Waterworks, &c.	Rothwell Local Board	Mr. Starkie	do.
Farm Buildings, &c. Forder, South Brent, Devon	Mr. Barrons	.....	Mar. 15
Lodge and Refreshment Room, Endcliffe, Woods	Sleaford Corporation	C. F. Wike	Mar. 16
*Works and Materials	Colchester Twn Coun.	H. Goodyear	do.
*Erection of Isolation Hospital	Brentford Local Board	J. H. Strahan	do.
*Erection of Baths and Washhouses	Islington Vestry.....	A. H. Tiltman	do.
*Sewer Construction	do.	*Official*	do.
*Tree Gratings	do.	do.	do.
*Supply of Hydrant for Ore Yard	do.	do.	do.
*Artificial Stone Works	Bermondsey Vestry ..	do.	do.
*Manufacture, Supply, &c.	.....	J. G. W. Aldridge	do.
*Works and Materials (Woolwich Distrct.)	War Department	*Official*	do.
Shelter, Flannons Quay	Portsmouth Corp.	do.	Mar. 17
*Works and Materials	Tottenham Local Bd.	do.	do.
*New Fence	Norwich Training Coll.	.....	do.
*Fitting up Latrines, Urinals, &c. at Workhouse	St. George's Union....	H. Saxon Snell	do.
*Works and Materials (Eastern District)	War Department	*Official*	Mar. 18
*Works and Materials (Dover)	do.	do.	do.
*Works in connexion with Refuse Destructor	Bristol U.S.A.	F. Ashmead	do.
*Residence for Medical Superintendent	Wilts County Asylum	C. S. Ady	do.
Road Metal	Selby Local Board	Thos. Mallinson	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Paving Stones and Materials	Carlisle Corporation..	W. Howard Smith	Mar. 18
People's Hall, Liverpool	Committee	Ware & Rathbone	do.
*Roadmaking and Paving Works	Fulham Vestry	W. Sykes	do.
*Brick and Pipe Sewers, &c.	do.	J. P. Norrington	do.
*Works and Materials (one year)	do.	*Official*	do.
*Wood Paving Works	Chiswick Local Board	A. Ramsden	do.
*Sanitary Work at Eastern Hospital	Met. Asylums Board..	Keith D. Young	Mar. 19
*Laying-out Cemetery	Sutton-in-Ashfield L.B.	Mr. Wm. Bishop	do.
*Cast-iron Pipes, &c.	Basingwold U.S.A. ..	*Official*	Mar. 20
*New End Pavilion Block	Tonbridge Union	W. Oakley	do.
*Sewerage and Road Works	Hornsey Local Board	T. de Courcy Meade	do.
*Building Works	do.	do.	do.
Enlargement of Hotel, Milton, Hants	.....	J. Colson & Son	Mar. 21
Infant School, Six Bells, near Abertillery	Llanhilleth Sch. Bd...	Jas. McBean	Mar. 23
*Works and Materials (Sheerness Sub-District)	War Department	*Official*	do.
*Works and Materials (Brighton Sub-District)	do.	do.	do.
*Works and Materials (Sandhurst)	do.	do.	do.
*Enlargement of Stamford Hill School	Tottenham Local Bd.	C. Bell	do.
*Wood Paving	Wandsworth Bd. of Ws	J. C. Radford	do.
*Works and Materials (South Wales)	War Department	*Official*	Mar. 25
*Making-up Road	Harrow Local Board..	E. R. Capon	do.
Llandaff and Taibach Bridges, Diversion of Roads, &c.	Glamorgan C. C.	*Official*	do.
*Sea Wall and Esplanade	Sandgate Local Board	JW. L. Parrott	do.
Granite Road Metal	Lincolnshire C. C. ..	Chas. Kirk	April 1
Maintenance of Hydraulic Cranes, &c.	Swansea Harb. Trust.	*Official*	April 2
*Church, St. Mark's, Saltaburv	The Committee	A. J. Reeve	No date
Additions to Premises	West Harlepool Pulp & Paper Co. Lim.	John Garnett	do.
Re-building Falstone Church, North Tyne	Rev. R. Pictou	Plummer & Burrell	do.
Post Office and Arcade, Goole	.....	H. B. Thorp	do.
Four Houses, Petteril-street, Carlisle	John Welsted	G. D. Oliver	do.
Additions to Barton Manor, Westmorland	Rt. Hon. Sir U. Kay Shuttleworth, Bt. M.P	C. J. Ferguson	do.
Two Large Steam Boilers	Glamorgan Coun. Asy.	.....	do.
Business Premises, Plymouth	R. F. Roper	Jas. Harvey	do.
Plate Girder Bridge and Cantilever Bridge	Rothesay Town Coun.	Daniel Macfie	do.
Sewering, Roadmaking, &c. Queen's Park Estate, Kingsthorpe	Conservative Freehold Land & Building Soc.	J. T. Ingman	do.
Mission Buildings, Bristol	.....	John Bevan	do.
Teacher's House	Bothwell School Bd...	Bruce & Hay	do.
*New Barracks and Shops, Swindon	Salvation Army	W. Gilbee Scott	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Superintendent of Night Scavenging	Stockton-on-Tees Corp.	Not stated	Mar. 10
*Clerk of Works	Governors Huish Sch.	£2 2s.	No date
*Quantity Surveyors, Quantity Clerks, &c.	War Department	Not stated	do.

Those marked with an Asterisk (*) are advertised in this Number. Contracts, pp. iv., vi., viii., *and* ix. *Public Appointments, pp.* ix. *and* xx.

MEETINGS.

SATURDAY, MARCH 7.

Association of Public Sanitary Inspectors (Carpenters' Hall).—Mr. W. Middleweek on "Public Baths and Washhouses in the Metropolis: Their History and Development." 6 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." IV. 3 p.m.

Edinburgh Architectural Association. — Visit to Roseburn House, Saughton Mill, and Saughton House.

MONDAY, MARCH 9.

Society of Arts (Cantor Lectures).—Professor R. Meldola, F.R.S., on "Photographic Chemistry." I. 8 p.m.

TUESDAY, MARCH 10.

Institution of Civil Engineers.—Discussion on Mr. J. Thornhill Harrison's paper on "The Subterranean Water in the Chalk Formation of the Upper Thames, and its Relation to the Supply of London." 8 p.m.

Society of Arts (Applied Art Section).—Mr. J. Starkie Gardner on "Enamelling and Damascening." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. J. Sykes on "The Nature of Nuisances, including Nuisances the abatement of which is Difficult." 8 p.m.

Birmingham Architectural Association.—Mr. W. H. Bidlake, M.A., on "Rock Structures and their effect on Building." 7.30 p.m.

Royal Society of Antiquaries of Ireland.—Meeting at Dublin.

WEDNESDAY, MARCH 11.

Architects' Benevolent Society.—Annual General Meeting of Subscribers and Donors. The President, Mr. Waterhouse, R.A., will take the chair at 5 p.m.

Carpenters' Hall (Free Lectures to Artisans).—Mr. Thomas Blashill on "The Carpenter as House-builder." 8 p.m.

Sanitary Institute.—Professor A. Wynter Blyth on "The Prevention of Infectious Diseases." 8 p.m.

Society of Arts.—Messrs. H. Newman Lawrence and Arthur Harries, M.D., on "Electricity in Relation to the Human Body." 8 p.m.

THURSDAY, MARCH 5.

Society for the Encouragement of the Fine Arts.—Mr. William Hole on "The Elements of Pictorial Beauty." 8 p.m.

Royal Institution.—Professor C. Meymott Tidy on "Modern Chemistry in Relation to Sanitation." II. 3 p.m.

Institution of Electrical Engineers.—8 p.m.

Society of Antiquaries.—8.30 p.m.

Edinburgh Architectural Association.—Mr. A. Macpherson on "Some Elements of Design. 8 p.m.

Dundee Institute of Architecture.—Mr. John Kinross on "Modern Church Architecture." 7 p.m.

FRIDAY, MARCH 13.

Institution of Civil Engineers (Students' Meeting).—Mr. W. A. P. Tait on "The Lanarkshire and Ayrshire Railways." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. A. Wynter Blyth on "Diseases of Animals in Relation to Meat Supply; Characteristics of Vegetables, Fish, &c., Unfit for Food." 8 p.m.

Society of Arts (Popular Afternoon Lectures).—Captain Abney, F.R.S., on "The Science of Colour." 4.30 p.m.

SATURDAY, MARCH 14.

Architectural Association. — Visit to the Tower Bridge Works. Meet at 3 o'clock at the entrance adjacent to the Tower.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." V. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

1,736.—GLAZING WINDOWS: *W. J. Hall and another.*—It is proposed by this patent to fix window frames and shop-fronts with the rebated side outwards, so as to enable the glass to be put in from the outside, either in the ordinary way or bedded in the rebate with felt, indiarubber or similar material, secured with beads or mouldings screwed, clamped, or so fastened as to be easily removable in case of breakage, or to be replaced.

2,016.—HEATING BUILDINGS BY HOT-AIR: *E. Marsh.*—According to this invention, a pipe is brought from the outside of the building into the lowest basement through a fire or gas stove into the main flue, and from that the pipe is taken into the rooms above which require heating. The air in the hot pipe, becoming lighter, rises and causes a continual supply of pure, hot, atmospheric air from the outside, into the places and room above that require heating.

3,508.—ASPHALTE AND CONCRETE STRUCTURES: *J. W. Helliwell.*—Between layers of the plastic substance it is proposed by the patentee to insert wire netting, so that on several layers being pushed together the asphalte or concrete will pass into the interstices or wire or network, and become cemented, so as to form one homogeneous thickness. When slabs made in this way are placed in position, the structure is made watertight by running asphalte between the joints.

19,139.—COWLS: *H. Faulhaber* (Wurtemberg).—In the revolving cowls which form the subject of this patent, the fixing is so arranged as to fully protect the cowl at its point of suspension both against soot and smoke coming from the chimney, as well as against rain or other moisture. A spindle or sleeve is employed, but at the top of the spindle is fixed a ball on which the whole weight of the cowl depends.

18,263.—BOARDED ROOFING: *E. A. Jollye.*—The boards are, according to this patent, grooved and moulded in such a shape that they may readily be fixed, and after fixing may be treated with creosote, preservative, or paint. It is claimed that these wooden roofs are less noisy and more healthy than those of corrugated iron. The material also can be readily shipped.

NEW APPLICATIONS FOR PATENTS.

February 16.—2,749, J. Young, Fixing Tiles or Panels in Stove Grates without the use of Plaster or Cement.—2,760, J. Hall, Dovetailing Machines.—2,763, C. Ehmann and F. Heaton, Unpickable Window and Door Fastener. 2,775, J. Zallee, Roofs.—2,779, J. Skilton, Heating and Ventilating.—2,787, T. Oliphant and others, Ventilators or Ventilating Cowls.—2,791, J. Boyd-Wilson, Bridge, Flooring, Roofing, &c., and Fire-resisting Constructions and Materials.—2,794, J. Spence, Adjustment and Saws in Stone-cutting Machines.

February 17.—2,819, J. Nicholls, Window Sash Holder. —2,823, C. Gannaway, Ventilators.—2,828, E. Collier, Securing the Knobs or Handles of Door Locks and Latches.—2,831, T. Podger, Detaching Sashes from Window-Frames, and raising and lowering same without weights.—2,849, W. Wheeler, Revolving Ventilators and Chimney Cowls.—2,865, H. Williams, Composition for Paving, Roofing, and Building Purposes.—2,884, S. Vliet, Scaffold Brackets.

February 18.—2,918, N. Lines, Taps and Cisterns for Water-closets.—2,922, R. Crane, Floor-warming Ventilating Radiators or Coils.—2,945, W. Withington, Disinfecting Water-closets.

February 19.—3,031, C Anderson, Dry Closets.—3,035, B. Thwaite, Portland Cement.—3,040, G. Bray, Lighting and Ventilating Rooms

February 20.—3,070, G. Lawford, Water Waste-preventing Cistern.—3,086, H. Parry, Lime Kilns.—3,130, P. Blake, Preventing the bursting of pipes in frosty weather.—3,147, J. Meyer, Coupling outlet or discharge pipes with sewer or drain pipes.—3,161, C. Abel, Metal Frameworks for portable Structures.

February 21.—3,166, J. Main, Roofing, &c.—3,185, T. Gregson, Ventilating fans.—3,195, F. Williamson, Ventilators or Cowls.—3,209, H. Lake, Shutters for Windows, &c

PROVISIONAL SPECIFICATIONS ACCEPTED.

19,841, G. Harrison, Sheet Lead or Cast Stench-trap. —20,215, W. Hooker, Hanging Sliding Windows, to be opened from the inside.—20,492, C. Vollmann, Pipe Connexion.—20,649, B. Giraud Blocks for Gutters, &c.—752, W. Mather, Imitation and Inlaid Woods.—333, C. Coe, Preventing the Bursting of Water-pipes.—1,238, E. Hoyland, Smoke-preventing Chimney-cowl.—1,360, W. Thompson, Stoves.—1,433, A. Thomas, Sash-fasteners. —1,529, E. Drummond, Fastening Door Knobs or Handles to their Shanks.—1,916, H. de Lastelle, Construction of Buildings.—1,934, W. Horn, Screen Door.—1,875, R. Fisher, Heating Buildings.—1,940, H. Herrmann, Parquet Floor.—2,080, W. Munns, Stone-crushing Machines,—2,273, C. & J. Holdsworth, Wind, Dust, and Rain-excluder for Doors

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

5,719, W. Taylor, Cement.—15,263, W. Wall, Door-bolt and Indicator.—20,222, H. Turner, Hinges.—401, S. Adams, Sanitary Closets.

SITES FOR ARTISANS' DWELLINGS.—A large number of plots of land, which the London County Council have reserved for the erection thereon of dwellings for the labouring classes, will be offered for sale at the Mart on the 24th March current. The sites are situated in Limehouse—at corners of Brook and Cranford-streets, an area of 19,000 feet, where a minimum of 281 persons is to be accommodated: in Deptford—seven plots, in Hughes's-fields, with frontage in Armada-street, having an aggregate of 104,534 feet superficial, upon which the purchasers must agree to erect dwellings for a total of at least 900 persons: and in Greenwich—three plots in Old Woolwich road and Lower East-street, with a total area of 34,470 square feet, and to accommodate at least 288 persons. The sale of these reserved sites will be made concurrently with the offer by the Council, at auction, for sale or letting, of some property at Mount Pleasant, Clerkenwell, and of various parcels of building land at Camberwell, Limehouse (Brook-street), Deptford (Hughes-fields), Kentish Town-road (Great College-street), and Putney-bridge.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

FEBRUARY 23.—By B. *Brown:* No. 801, Commercial-rd., f., r. 49*l.*, 740*l.*; No. 811, u.t. 47 yrs., g.r. 4*l.*, r. 40*l.*, 385*l.*; f.g.r. of 4*l.*, with reversion in 47 yrs., 180*l.*—By *E. H. Sales:* 17, Wisteria-rd., Lewisham, f., r. 80*l.*, p.a. 315*l.*

FEBRUARY 24.—By *C. Rawley Cross:* 92, William-st., Regent's pk., u.t. 31 yrs., g.r. 7*l.*, 490*l.*—By *Debenham, Tewson & Co.:* F. site of land, 820 ft., Great Turnstile, Holborn, let at 60*l.* per annum.—By *J. F. Gibbons:* 32, Pembury-grove, Clapton, u.t. 57 yrs., g.r., 6*l.*, 245*l.*—By *Dowsett & Co.:* 3, Pressland-st., Paddington, u.t., 76 yrs., g.r. 6*l.*, r. 26*l.* 200*l.*

FEBRUARY 25.—By *J. & R. Kemp & Co.:* 5, Waterloo-pl., Pall Mall, u.t. 25 yrs., g.r. 240*l.* 10s., 4,070*l.*—By *A. G. Thomson & Co.:* 24, 26 and 28, Waterford-rd., Fulham, u.t. 68 yrs., g.r. 18*l.*, 800*l.*; 13 and 15, Henley-st., Battersea, u.t. 70 yrs., g.r. 5*l.*, r. 45*l.* 10s., 190*l.*—By *R. Tidey & Son:* 17, Southgate-rd., De Beauvoir Town, u.t. 27 yrs., g.r. 2*l.*, r. 28*l.*, 270*l.*; 32, Benyon-rd., u.t. 38 yrs., g.r. 10s., 340*l.*; 61, Church-rd., Islington, u.t. 47 yrs., g.r. 5*l.* 10s., 520*l.*; 175 and 177, Church-rd., u.t. 49 yrs., g.r. 13*l.*, r. 78*l.*, 775*l.*—By *J. Dawson & Son:* No. 451, Edgware-rd., u.t. 15 yrs., g.r. 2*l.*, 300*l.*; 20 to 32 (even) Cheshire-st., and 23, 25 and 27, Winchester-st., Bethnal Green, f., r. 201*l.*, 1,025*l.*; 31, Winchester-st., f., r. 15*l.* 12s., 175*l.*; 5 and 6 Regent-ter., Kingston, f., r. 130*l.*, 2,010*l.*; 1 to 6 Norbiton-ter., with premises adjoining, f. 1,970*l.*; f.g.r. of 30*l.*, Reversion in 75 yrs., London-rd. Norbiton, 690*l.*; f.g.r. of 30*l.*, Reversion in 78 yrs., Regent-ter., 950*l.*; f.g.r. of 26*l.*, Reversion in 88 yrs., Church-rd., 620*l.*; Church-st., Kingston-on-Thames, f. Business premises and Cottage, r. 65*l.*, 1,300*l.*

FEBRUARY 26.—By *E. Stimson:* 5 and 7, Warwick-st., Vauxhall, u.t. 57 yrs., g.r. 10*l.*, r. 65*l.*, 450*l.*; 98, Lambeth-rd., Lambeth, f., r., 72*l.*, 760*l.*; 15, 16, and 17, Pear Tree-st., Copyhold, r., 70*l.* 4s., 600*l.*; 49 and 51, Aytoun-rd., Stockwell, f., 900*l.*; 11, 13, 15, and 17, Barrington-rd., Brixton, u.t., 32 yrs., g.r., 22*l.*, r., 120*l.*, 915*l.*; 54 and 56, Vassall-rd., u.t., 9 yrs., g.r., 27*l.* 6s., r., 86*l.*, 140*l.*; 64, Loudoun-rd., St. John's Wood, u.t., 46 yrs., no g.r., 550*l.*; 1, Southsea-rd., Surbiton, u.t. 10 yrs., g.r. 45*l.*, with Machinery and Plant, 625*l.*—By *C. C. & T. Moore:* 38 and 40, Heath-st., Stepney, f., r. 46*l.* 16s., 420*l.*; 27, Denmark-st., St. George's East, f., 105*l.*—By *E. Millard:* 14, Goldsmith-st., Drury Lane, f., r. 30*l.*, 530*l.*; 5, Castle-ter., Richmond, f. r. 110*l.* including Mortgage, 2,640*l.*; 5, Bolsover-st., Marylebone, u.t. 8 yrs., g.r. 20*l.*, r. 60*l.*, 270*l.*—By *Farebrother, Ellis, Clark, & Co.:* 6, Green-st., Bethnal Green, u.t. 70 yrs., g.r. 6*l.*, 400*l.*; 46, Compton-st., Brunswick-sq., u.t., 15 yrs., g.r. 26*l.* 5s., 250*l.*—By *Newton & Co.:* 27 Fore-st., City of London, u.t. 25 yrs., g.r. 45*l.*, r. 110*l.*; 255*l.*; 46, Milton-st., u.t. 4 yrs., g.r. 30*l.*, r. 120*l.* 155*l.*; 538 and 540 Kingsland-rd., Kingsland, u.t. 9 yrs., g.r. 24*l.* 19s. 10d., r. 129*l.* 19s. 10d., 470*l.*; 43 and 45, Copenhagen-st., Barnsbury, u.t. 13 yrs., g.r. 8*l.* 13s. 4d., r. 80*l.*, 320*l.*; 106, King Edward's-rd., Hackney, u.t. 48 yrs., g.r., 7*l.*, 315*l.*—By *Jenkins & Sons*, 9, Alpha-rd., New Cross, u.t., 43 yrs., g.r. 3*l.*, 260*l.*; 32, Cranfield-rd., Brockley, u.t. 75 yrs., g.r. 5*l.*, r. 35*l.*, 265*l.*; 96, East Surrey Grove, Peckham, u.t. 71 yrs., g.r., 4*l.*, 260*l.*

FEBRUARY 27.—By *T. G. Wharton:* Nos. 300 to 304, Strand, f., r. 1,538*l.* a year, including mortgage and subject to an annuity, 19,710*l.*—By *Fuller, Horsey, Sons & Cassell:* "The White Swan" public-house, Nine Elms, f., r. 90*l.*, 2,000*l.*: "The Manor House Wharf," f., area 19,000 sq. ft., r. 275*l.*, 4,860*l.*; "Lavers Wharf," f., area 145,000 sq. ft., r. 470*l.*, 8,600*l.*; "Middle Wharf," "White Swan Wharf," and "Kirby's Wharf," f., area 19,900 sq. ft., 5,100*l.*—By *Baker & Sons:* 18, 21 and 22, Claremont-sq., Islington, u.t. 22 yrs., g.r. 3*l.*, r. 170*l.*, 1,000*l.*; By *Deverell & Co.:* 9, Fitzroy-rd., Regent's Pk., u.t. 71 yrs., g.r. 5*l.*, r. 60*l.*, 600*l.*; 60, St. John's-rd., Holloway, u.t. 48 yrs., g.r. 10*l.* 10s., r. 32*l.*, 210*l.*; 81, 83, Carlton-rd., Kentish Town, u.t. 60 yrs., g.r. 6*l.*, r. 38*l.*, 330*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.t. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	6/10 0 / 7/15 0
Teak, E.I..	load	8.10 0 / 14 0 0
Sequoia, U.S.	ft.cu.	2/3 / 3/0
Ash, Canada	load	2/10 0 / 4.3 0
Birch, do.	.....	2 5 0 / 4/5 0
Elm, do.	.....	3/10 0 / 4/15 0
Oak, Dantzic, &c.		2.0 0 / 3/15 0
Oak, do.	.....	2.10 0 / 4.10 0
Canada	.....	4 / 6 / 6.10 0
Pine, Canada red		3/10 0 / 3.1 0
Do, yellow		3/0 0 / 5.10 0
Lath, Dantzic		5/0 0 / 6 / 0
St. Petersburg		5.0 0 / 7 0 0
Deals, Finland, 2nd & 1st std		7 0 0 / 10 0 0
Do. wh. & 3rd		7 / 0 / 8 0 0
Do. battens		6 0 0 / 7 10 0
St. Petersburg, 1st yellow		9/0 0 / 14/0 0
Do. 2nd yellow		8/0 0 / 9/0 0
Do. white		6/10 0 / 10/0 0
Swedish		6/10 0 / 15/0 0
White Sea		8/0 0 / 16 10 0
Canada, Pine 1st		13/0 0 / 24/0 0
Do. do 2nd		9 0 0 / 15/10 0
Do. do. 3rd, &c.		6 10 0 / 10/0 0
Do. Spruce. 1st		8/10 0 / 10/10 0
Do. do. 3rd & 2nd		6/0 0 / 7/10 0
New Brunswick		5/0 0 / 7/0 0
Battens, all kinds		4/10 0 / 15.10 0
Flooring Boards, 1 in. prep.		
1st		0/10 0 / 0/14 0
2nd		0/9 0 / 0/10 6
Other qualities		0 5 0 / 0/7 6
Cedar, Cuba	..ft.	/3d / /4d
Honduras, &c.		/3d / /4d
Mahogany, Cuba		/4d / /5d
St. Domingo, cargo av		/4d / /5d
Mexican do. do		/4d / /5d
Tobasco do. do		/5d / /6d
Honduras do.		/5d / /6d
Box, Turkey	ton	4/0 0 / 13/0 0
Rose, Rio		12/0 0 / 19/0 0
Bahia	.....	10/0 0 / 18/0 0

TIMBER (*continued*).		
Satin, St. Domingo	..ft.	0/0 0 / 0/1 0
Porto Rico	....	0/0 10 / 0/1 6
Walnut, Italian..		0/0 4 / 0/0 7
METALS.		
IRON—Bar, Welsh, in London	..ton	6/5 0s. 6/15 0
Do. do. at works in Wales	.....	5/15 0 / 6/5 0
Do. Staffordshire, in London	....	6/5 0 / 7/0 0
COPPER—British, cake and ingot		56/0 0 / 57/0 0
Best selected	..	59/0 0 / 60/0 0
Sheets, strong		68/0 0 / 0/0 0
Old, bolts	.....	52/10 0 / 0/0 0
YELLOW METAL	lb.	0/0 6 / 0/0 6½
LEAD — Pig, Spanish	..ton	12/11 3 / 12/12 6
English, com. brands	.....	12/12 6 / 13/13 0
Sheet, English, 3 lbs. per sq. ft. and upwards	..	14/10 0 / 15/0 0
Pipe	.....	15/0 0 / 0/0 0
ZINC — English sheet	..ton	27/10 0 / 0/0 0
Vieille Montagne	.....	28/5 0 / 0/0 0
TIN—Straits	....	90.10 0 / 0/0 0
Australian	....	90/15 0 / 0/0 0
English ingots		94/10 0 / 0/0 0
OILS.		
Linseed	..ton	21/10 0 / 21/15 0
Cocoanut, Cochin		36/0 0 / 0/0 0
Do. Ceylon	....	32/0 0 / 0/0 0
Palm, Lagos	....	25/0 0 / 0/0 0
Rapeseed, English pale	.....	29/5 0 / 29/10 0
Do. brown	.....	28/0 0 / 0/0 0
Cottonseed ref.	..	18/15 0 / 0/0 0
Olive	.....	21/15 0 / 24/0 0
Lubricating, U.S.		6/0 0 / 7/0 0
Do. refined	.....	7/10 0 / 12/0 0
TAR— Stockholm	barrel	1/1/6 / 1/2/0
Archangel	....	0/14/6 / 0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ACCRINGTON.—Accepted for erecting Baptist Chapel at Woodnook, Accrington, Lancashire. Mr. George Baines, architect, 4, Grand Winchester-street, E.C. :—

Excavator, Mason, Bricklayer, &c.—Hannibal Rainsbottom, Accrington	£1,470 0 0
Carpenter and Joiner, &c.—William Parker, Accrington	985 0 0
Slater and Plasterer—James Whitehead, Accrington	7 13 0
Plasterer—Thomas Cronshaw, Douthwaite	119 0 0
Plumber, &c.—Carter & Sons, Accrington	211 0 0
Smith and Ironfounder—Joseph W. Bridge	344 4 0
Painter—H. Houlgrave, Accrington	93 0 0
Amounts provided for pulpit and heating apparatus	190 0 0
Total	£3,487 14 0

BODMIN.—For the erection of five dwelling-houses, at St. Leonard's, for Mr. J. B. Crocker. Mr. John Dennis and Mr. Lake Dennis, joint architects, Bodmin and Birmingham :—

Entire Work.—James Julian	£1,220 0 0*
,, —S. Trehane	1,100 0 0
,, —Burt & Co.	1,060 0 0
Carpenters' Work—J. A. Rowe	480 0 0
,, —W. Tinney	448 2 6
,, —R. Gruse	436 0 0
,, —C. J. Wall	409 0 0
,, —N. Shelley & Sons, Bodmin*	380 14 0
Masonry.—E. Harris	380 0 0
,, —Ham & Featherstone, Bodmin*	374 0 0

* Accepted.

CARDIFF.—For road-making, construction of reservoir embankment, culverts, bridges and other works of water-supply, Roath-park, for the Corporation. Mr. W. Harpur, C.E., Borough Engineer, Town-hall, Cardiff. Quantities by the Engineer :—

J. L. Bridge	£31,553 4 10
Thomas Rees, Jun.	30,598 6 7
J. C. Pearson	29,154 4 3
Thomas Dawson Ridley	28,922 3 9
James Allan, Cardiff (accepted)	27,289 17 6

CARLISLE. Accepted for additions to the Hospital, Carlisle. Mr. J. Murchie, architect :—

Builder James Baty	£205 18 2
Joiner—W. Lattimer	93 18 8
Plasterer—S. Ferguson	48 2 0
Painter and Glazier—D. Canning	11 11 0
Slater—D. Armstrong	9 5 0
Total	£368 16 10

[All of Carlisle.]

COLCHESTER.—For the erection of new foul wards for the Colchester Board of Guardians. Mr. J. W. Start, F.S.I., Cups-chambers, Colchester, architect and surveyor :—

S. Garwood	£2,988 10 0	Everett & Son	£2,590 0 0
T. J. Ward	2,788 0 0	G. Farran	2,349 0 0
C. E. Orfeur	2,580 0 0	F. Dupont	2,290 0 0
R. Beaumont	2,528 0 0	W. A. Chambers*	2,249 0 0

* Accepted. [All of Colchester.]

DERBY.—For the erection of new shop premises, St. Peter's-street, for Mr. W. Malin, Derby. Mr. Arthur Paton, architect, 8, St. James's-street, Derby. Quantities by the architect :—

John Wood	£3,332 19 4	H. Rakewell	£2,780 0 0
E. Spencer	2,924 0 0	G. Wagg	2,774 0 0
G. Pemberton	2,189 0 0	J. Dickinson	2,770 0 0
Walker & Son	3,118 0 0	W. Walkerdine	2,507 0 0
Tomlinson & Co.	2,789 0 0	W. Eaton, Derby*	2,384 0 0
F. Slater	2,820 0 0	W. Edwards	2,541 0 0

* Accepted, subject to the amendment of plans.

ELLAND.—Accepted for sewering, levelling, metalling, flagging, &c., Mean-lane, for the Local Board. Mr. Geo. Hepworth, Surveyor, 11, Bradford-road, Brighouse :—

John Slinger, Scholes, Cleckheaton	£210 18 6

ELLAND.—Accepted for sewering, levelling, paving, &c., Ainley-street, for the Local Board. Mr. George Hepworth, surveyor, 11, Bradford-road, Brighouse, Yorks. Quantities by the Surveyor :—

Belfield & Barnes, Sowerby Bridge	£100 13 9

EXMOUTH.—For enclosing and fitting the show-yard, for the Devon County Agricultural Association :—

P. Blowey	£797 0 0
J. H. Foaden, Ashburton (accepted)	668 0 0

[The work is tendered for on a schedule of prices, the approximate quantities being given.]

HARROW.—For the construction of pipe-sewers, with man-holes, &c., on the sewage farm at Harrow Station, for the Hendon Union Rural Sanitary Authority :—

Richard Fallard	£4,814 0 0	H. Drury	£3,524 8 9
E. & W. Iles	4,017 0 0	Mackay	3,498 9 2
Cook & Co.	3,870 0 0	J. Bloomfield, Tottenham (accepted)	3,214 8 6
G. Overton	3,823 0 0		
J. Dickson	3,722 6 7		

LEEDS.—Accepted for the conversion of a warehouse into offices, &c., in Bud-street, for Messrs. A. & A. Musgrave. Mr. W. H. Bevers, architect, 22, Bond street, Leeds. Quantities by the architect :—

W. Irwin & Co., Burley-road, Leeds	£620 0 0
Ditto (supplementary estimate)	79 10 0
Total	£899 10 0

LONDON.—For the erection of a school to provide accommodation for 800 children on the site in Chisenhale-road, Bow, and also for the erection of a schoolkeeper's house with a single cookery centre underneath, for the School Board for London. Mr. T. J. Bailey, Architect :—

			If dashes be built in glazed brick-facing, add—
W. H. Lorden & Son	£29,418	.....	£1,581
Foster & Dicksee	19,963	.....	1,394
J. Smith & Sons	19,373	.....	1,665
J. Marsland	17,995	.....	1,045
G. & S. Williams & Son	18,441	.....	1,569
Lathey Bros.	18,493	.....	1,570
Holloway Bros.	18,240	.....	1,631
Chas. Cox	17,259*	.....	1,513*

* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of a school to provide accommodation for 1,000 children on the Lauriston-road site, Victoria-park, South Hackney, and also for the erection of a schoolkeeper's house, with a room underneath, suitable for technical purposes, for the School Board for London. Mr. T. J. Bailey, Architect :—

W. H. Lorden & Son	£15,360 0 0	Atherton & Latta	£14,838 0 0
Pato Bros.	15,160 0 0	Patman & Fotheringham	14,794 0 0
S. & W. Patterson	15,108 0 0	K. Lawrance & Sons	14,456 0 0
J. T. Chappell	15,085 0 0	H. Lovett	14,201 2 9
Hart Bros.	15,020 0 0	Chas. Cox*	13,891 0 0
J. W. Hobbs	14,856 0 0		

* Recommended by the Works Committee for acceptance.

LONDON.—For executing sanitary works at the Byron and Bright-street School, Bromley, for the School Board for London. Mr T. J. Bailey, Architect :—

Davis Bros.	£1,375	Dove Bros.	£1,085
Killby & Gayford	1,373	Atherton & Latta	1,080
Chas. Cox	1,095	J. Shillitoe & Sons*	818

* Recommended by the Works Committee for acceptance.

LONDON.—For providing a new system of drainage at the Southampton-street Deaf-and-Dumb School, Winchester-street site, Pentonville, for the School Board for London. Mr. T. J. Bailey, Architect :—

W. V. Gard	£147	H. Mallett	£140
Wm. Rennell	137	C. Dearing & Son	130
Dav. Bros.	131	McCormick & Sons*	112

* Accepted by the Works Committee.

LONDON.—For the erection of a factory in Bermondsey-street, S.E., for Messrs. Roberts & Leete. Mr. T. H. Smith, architect, 17 and 18, Basinghall-street, E.C. Quantities by Messrs. Gardiner Son, & Theobald, 120, Great Russell-street :—

W. Shepherd & Co.	£11,214	C. F. Beasley	£10,619
J. Greenwood	11,098	H. L. Bullaway	10,609
Turtle & Appleton	11,097	J. W. Falkner	10,608
Patman & Fotheringham	11,010	H. J. Williams	10,398
Patrick & Son	10,742	Lawrance & Sons	8,985
Holliday & Greenwood	10,737	Allen & Sons	8,982
Brass & Son	10,726		

LONDON.—For the erection of van factory, Cobb-street, St George-in-the-East, for Messrs. Bonallack & Son. Messrs. Wilson, Son, & Aldwinckle, architects :—

G. Sharp	£2,760	C. Cox	£2,581
J. Mortar	2,698	D. Todd	2,479
G. Payne	2,643	J. Mills	2,400
T. Little	3,638	W. Gregar & Son	2,230
Hearle & Son	2,630	W. Gladdin	2,197

LONDON.—For the erection of new sorting office at Hewer-street, North Kensington, for the Commissioners of Her Majesty's Works and Public Buildings. Mr Henry Tanner, Architect :—

W. Buckeridge, Kensington (accepted)	£2,113 0 0

LONDON.—For re-building Nos. 60 and 62, Great Titchfield-street, W. Mr. Walter J. Miller, architect, 182, Oxford-street, W. :—

E. Kerry & Son	£3,757	Watson Bros.	£3,227
W. McSwiney	3,389	R. Perkins	3,147
E. H. & A. Bywaters	3,277	T. Stevens	3,100

LONDON.—For the erection of workshops, &c., at Shoreditch, for the Patent Letter and Enamel Company, Limited. Mr. H. Percy Monckton, architect, 32, Wallbrook, E.C. :—

Turtle & Appleton	£1,145	Hall, Beddall, & Co.	£1,084
Harrison & Spooner	1,134	E. A. Roome (accepted)	1,017

Iron Roofing.

Holden & Co.	£225 0 0	Gregson & Co*	£177 10
Braby & Co.	185 0	* Accepted.	

LONDON.—For external varnishing and internal repairs to be done at the Licensed Victuallers' Asylum, Asylum-road, Old Kent-road, London, S.E. Mr. W. H. P. Pratt, architect. Quantities prepared by Mr. C. R. Griffith :—

H. Mestwerdt, Brixton			£371 5 6
Walker Brothers, Poplar			318 0 0
S. Hayworth & Sons, Kingsland			295 0 0
R. J. Ames, Deptford			198 7 9
W. Wells, Paddington			189 16 0
W. Wythe, Bermondsey (accepted)			178 5 0

LONDON.—For the erection of stabling at Lewisham, for Mr. John Wallis. Mr. Albert L. Guy, architect, Lewisham :—

Jerrard	£420	Kennard Bros. (accepted)	£335
Robson	396		

LONDON.—For taking down stabling at the Lewisham Workhouse, and re-erecting same, for the Guardians of Lewisham. Mr. R. E. Crossland, A.R.I.B.A., architect, Forest Hill, S.E. :—

Kennard Bros. (accepted)	£377 0 0

LONDON.—For new system of drainage, with disconnecting and inspection manholes, water-closets, &c., for Mr. T. W. Carlton, 90, Caufield-gardens, West Hampstead, N.W. :—

The Sanitary and Domestic Engineering Company, Kilburn, N.W. (accepted at schedule of charges)	

LYNDHURST (Hants).—For alterations, out-buildings, &c., and the erection of greenhouse, vinery, &c., at Hill House, for Mr Percy E. Sankey. Messrs. Lemon & Blizard, architects :—

F. Reeks	£398 14	F. Osman	£760 10
J. Gale	382 0	C. Hayter, Lyndhurst*	743 9

* Accepted.

LYNDHURST (Hants).—Accepted for the erection of stable and coachhouse at Birch Lodge, for Mr. Geo. R. Green. Messrs. Lemon & Blizard, architects :—

C. Hayter, Lyndhurst	£462 0 0

MANSFIELD (Notts). For providing and laying the water mains required for the parish of Forcarall, together with all necessary sluice valves, fire hydrants, and other apparatus, for the Mansfield Union Rural Sanitary Authority. Mr. George Hodson, Engineer, Abbey-buildings, Westminster :—

Price & Shardlow	£1,520 0 0	Chas. Green	£1,388 7 7
H. Vickers	1,516 0 0	J. Tomlinson	1,327 0 0
H. Fotherby & Son	1,465 19 3	John Lane, Skegby*	1,326 15 0
James Wingrove	1,454 0 0	* Accepted.	
James Dickson	1,400 0 0		

MORLEY.—For laying cast-iron water-pipes, erection of bridges, &c., at Waterworks, for the Corporation. Mr. Chas. Gott, Engineer, 8, Charles-street, Bradford, Yorks :—

Prices per ton, delivered on the line of work.

	Straight pipes. Heavy section.	Straight pipes. Light section.	Irregulars. Socket joints.	Special pipes. One flange.	Special pipes. Two flanges.
The Steel Pipe Co., Ld., Kirkcaldy (steel pipes)	£18 0 0	£18 0 0	£30 0 0	£34 0 0	£34 0 0
Thomas Edington & Sons, Glasgow	6 14 3	6 15 0	11 15 0	12 5 0	12 15 0
Macfarlane, Strang, & Co., Glasgow	5 7 6	5 7 6	11 0 0	11 0 0	11 0 0
Cochrane & Co., Dudley	5 3 6	5 3 6	9 10 0	9 10 0	9 10 0
The Stanton Ironworks Co., Nottingham	4 19 6	5 1 0	8 7 6	8 10 0	9 0 0
Cochrane, Grove, & Co., Middlesbro'	4 17 6	5 0 0	8 0 0	8 10 0	9 0 0
The Staveley Coal and Iron Co., near Chesterfield*	4 15 0	4 15 0	9 10 0	10 0 0	10 10 0

Prices per ton, delivered at railway stations.

The Clay Cross Co., near Chesterfield	4 12 6	4 13 4	8 5 0	9 10 0	10 15 0

* Accepted.

MORTLAKE.—Accepted for the supply of road materials, &c., for the Mortlake District Highway Board. Mr. Henry Richards, C.E., Surveyor:—

	per yard. s. d.
Broken Granite, G. Le Maitre, Vale, Guernsey	14 10
Flints, J. Bowles, 1, Spencer-road, New Wandsworth	4 6
Team Labour, Hy Turner, Woodlands-road, Barnes	
Tar Paving, W. Kenchington, Railway-street, Barnes	1 5

NEWCASTLE UNDER LYME.—For re-making the Sidmouth road, for the Town Council. Mr. James Pattison, Borough Surveyor, Newcastle-under-Lyme:

Malabar & Poole	£335	5	7
G. Barlow	315	0	0
C. Wild	299	0	0
J. Gallimore	295	0	0
T. Maddock	£286	0	0
Smith & Taylor	259	10	0
F. Burke, Stoke-on-Trent (accepted)	253	0	0

PORTSMOUTH.—For the erection of a higher grade school, Portsmouth, for the Portsmouth School Board. Mr. Charles W. Bevis, architect, Southsea. Quantities by Messrs. Rade & Cogswell, Landport:

Reed, Blight, & Co.	£12,147	0	0
W. Ward	11,500	0	0
J. W. Quick	10,877	0	0
H. Jones	10,761	0	0
C. Dye	10,750	0	0
H. J. Evans	10,480	0	0
D. W. Leurs	10,373	0	0
W. R & C. Light	£10,119	0	0
W. Crockerell	9,999	0	0
T. T. Heal	9,950	0	0
A. & E. Sprigings	9,800	0	0
W. Learmouth, Portsmouth*	9,704	10	7

* Accepted.

RHONDDA VALLEY.—For the erection of a public-hall and workmen's institute, at Ynysllan, near Porth, for the Ynyshir and Watts Town Public-hall Company, Limited. Mr. Charles Taylor, architect, 32, Duke-street, Cardiff:

E. Turner & Sons	£3,288	0	0
John Williams	3,253	0	0
Jos. Thomas	3,230	0	0
Charles Shepherd & Son	3,174	0	0
Chas. Jenkins & Son, Porth (accepted)	£3,100	0	0
Jno. Hopkins	3,088	0	0
Jno. David Williams	2,889	10	0
Frederick Kastle	2,767	0	0

[Architect's estimate, £2,980.]

RICHMOND (Surrey).—For alterations, &c., to the "Station Hotel," Richmond, Surrey, for Mr J. Crouch. Mr. H. J. Newton, 49, Victoria street, Westminster, S.W., architect:

Putman & Fetheringham	£885	Turtle & Appleton	£720
S. R. Lamble	827	S. Godden, Bryanston-square (accepted)	695
H. Burman & Sons	795		

SHEERNESS.—Accepted for erecting seventy-five houses and forming roads, for the Sheerness Permanent Building Society:—

H. J. Carter, Grays	£11,250 0 0
Ditto, ditto, for roads	612 10 0

SOUTHAMPTON.—Accepted for the erection of detached house at Bitterne Park, Southampton, for the Rev. C. C. Wambey. Messrs. Lemon & Blizard, architects:—

A. Clacket, Bitterne	£600 0 0

SOUTH CROYDON.—For the erection of stabling and cottages for Mr. Albert Crundall. Mr. Benaiah W. Adkin, F.S.I., 35, Walbrook, E.C., architect:—

H. L. Holloway	£2,935	0	
Hunter & Bryant	2,800	0	
Maides & Harper	2,789	0	
Harris & Wardrop	2,770	0	
S. J. Jarrard	2,700	0	
Batty & Linfoot	£2,689	16	
J. Smith & Sons	2,670	0	
J. C. Bowyer	2,572	0	
S. Page, Croydon*	2,449	0	

* Accepted.

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WITHAM.—For kerbing, paving, and tar-paving, for the Witham Local Board of Health. Mr. Charles Pertwee, Surveyor, Chelmsford:—

	Hard York Kerb 12 by 3	Hard York Kerb 12 by 4	Extra Concreting to Kerb. Front	Extra Concreting to Kerb. Front and Back.	Granite Setts. 4 by 4	Limestone Setts. 4 by 4	Victoria Stone Paving.	Imperial Stone Paving.	Cliftonville Stone Paving.	Tar Paving 2½ in.	Tar Paving Extra Thick.
	Yd run. s. d.	Yd run. s. d.	Yd run s. d.	Yd run s. d.	Yd sup. s. d.	Yd sup. s. d.	Yd sup. s. d.	Yd. sup. s. d.	Yd sup. s. d.	Yd sup. s. d.	Yd sup. s. d.
Wm. Griffiths, Kingsland-road, E.	2 6	3 1	0 5	0 10	9 6	—	6 4	—	—	—	—
W. H. Wheeler, Sumner-street, S.E.	2 9	3 2	0 6½	1 0	9 0	—	7 6½	6 0	—	2 1	1 0
T. Wood, Market Hill, Maldon	3 3	3 8	0 9	1 0	7 9	—	6 10	—	—	—	—
D. Mackenzie, Clacton-on-Sea	2 6	2 9	1 0	1 6	9 5	—	6 6	—	—	2 6	0 6
Hy Potter, Chelmsford	2 4½	2 7½	0 3	0 5	9 1	8 6	6 9½	6 0	—	2 6	0 6
D. Marcher, Holmevale-road	2 3	2 4	0 4	0 8	7 6	—	6 3½	—	—	1 10	— 0
J. B. Blythe, Witham	2 3½*	2 7*	0 2*	0 3½*	8 0*	6 2*	6 3½*	—	—	—	—
W. H. Benstead, Maidstone	—	—	—	—	—	—	—	—	—	2 3	— 0
H. Grounds, Hall-street, Tottenham	—	—	—	—	—	—	—	—	—	2 6	1 3
Bradshaw & Co., Queen Victoria-street	—	—	—	—	—	—	—	—	—	2 4	0 8
Holman & Co., Bermondsey	—	—	—	—	—	—	—	5 3	—	2 4*	0 9*

* Accepted

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Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, but those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNES-DAY mornings.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent

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Deal Dadoes, from 1s. 2d. per ft. super.
Oak Dadoes ,, 1s. 8d. ,,
Walnut Dadoes ,, 1s. 11d. ,,
Oak, 1 inch Parquet Floors, laid and polished, from £7. 10s. a square.
Solid 1-inch Oak, straight boards, laid and polished, at £6. 18s. a square.
Solid ½-inch Oak Parquet for covering Deal floors, laid and polished, from £5 a square.
Oak Wood Tapestry Dadoes, from 1s. per foot super.
Walnut or Mahogany, from 1s. 3d. per foot. super.
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TO CORRESPONDENTS.

G. S.—H. M.—C. P. L.—J. M. F. (as we have not seen the other competition designs we cannot express an opinion on the selection).—A. B. F. (too late for this week).—S. & E. Assoc (no space this week).—J. J. H. (rather matter for a general newspaper than for our columns).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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The Builder.

VOL. LXI. No. 2510. SATURDAY, MARCH 14, 1891.

ILLUSTRATIONS.

Compton Wynyates, Warwickshire: Drawings by Mr. Heber Rimmer, Awarded the Silver Medal of the Royal Institute of British Architects :—

Perspective View ..... *Double-Page Ink-Photo.*
West and South Elevations ..... *Single-Page Ink-Photo.*
West and South Elevation of Courtyard, and Profiles of Mouldings ..... *Single-Page Ink-Photo.*
End of Great Hall; Large Gable and Tower of West Elevation ..... *Double-Page Ink-Photo.*
Porch and Bay-Window ..... *Single-Page Ink-Photo.*
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Railway Rates.

THE classifications and schedules of rates recently submitted to Parliament by the Board of Trade, under the Railway and Canal Traffic Act, present a remarkable contrast to the original proposals made by the railway companies. The latter raised a storm of hostility, and have been considerably modified from time to time by their promoters, many concessions having resulted from the representations made by the traders during the Board of Trade inquiry. Thus, many articles now appear in lower classes than those in which it was originally proposed to place them; but, apart from the reductions thus involved, there are wide differences in the charges applicable to the various classes, and also in the miscellaneous regulations. Several of the proposals which have undergone such alterations have been dealt with in our "Notes" during the interval which has elapsed since they were first made, but it may be convenient at the present juncture to notice the final form in which they have been submitted to Parliament. As the Provisional Orders Bills, in which these proposed rates and charges are incorporated, passed the second reading in the House of Commons on the 6th inst., they will next be considered in detail by a Grand Committee consisting of members of both Houses.

The rates per ton per mile are all lower than those proposed by the railway companies, as may be seen by comparing the accompanying table with that given in our issue of March 2, 1889 (p. 159), when the railway Bills first made their appearance. A table of comparative rates is also appended, worked out from the 1889 schedule of the London and North-Western and the present Board of Trade schedule applying to that Company, which shows at a glance the effect of the respective proposals. It may be mentioned that the rates finally adopted,—as given below,—vary somewhat from those contained in the draft schedules submitted by the Board to the Railway Company's Association last July. It will be observed that the London and North-Western plan was to charge so much per ton per mile for the first twenty miles, so much for the next twenty miles, and so on; while the Board of Trade propose a certain sum per ton per mile "for any distance not exceeding twenty miles," a lower sum for any distance between twenty miles and fifty, &c. It should be noted that nothing is included in the tables for cartage, this being an independent service, and chargeable accordingly.

A reference to the schedules of 1889 shows that an increased sum was claimed for terminals at certain large towns; but this has been abandoned, and the additions thus proposed have not been included in the accompanying statement. These additional amounts ranged from 2d. to 1s. 6d. for each end. The suggestion thrown out by the Board as to separate rates for truck and train loads not having been adopted by the railway companies, the former have themselves prepared schedules of reduced charges to apply to consignments of 10 tons and upwards (for goods in the four lowest classes), with still further reductions for lots of not less than 250 tons. The abatements in each case are small—not more than ·05d. per ton per mile.

In the important matter of "smalls," the companies had claimed a right to charge what they pleased for all consignments of less than 560 lbs., but the Board of Trade have placed the limit at 3 cwt., the maximum addition to the ordinary charge varying from 6d. to 2s. per consignment, according to the tonnage rate. These additional charges, we notice, amount to just about double those now made on "smalls," so that, although the limit is reduced from 5 cwt. to 3 cwt., the railway companies are given additional charging powers by way of compensation. Various proposals were made with regard to "returned empties," which, at present, are charged in accordance with a fixed mileage scale agreed upon by the railway companies some years ago, without any reference (with few exceptions) to the goods they had contained in the first instance. Most of the companies had placed them in the fifth (or highest) class, but the following somewhat peculiar clause has been adopted by the Board of Trade:—

"Returned empties shall be deemed to be included in the same class of the classification as comprises the merchandise which was carried in them when full; but the maximum rates and charges in respect of such returned empties shall not exceed 75 per cent. of the maximum rates and charges for the said class of merchandise."

The railway companies had proposed to treat all unclassified articles as being in Class 5, but the Board of Trade suggest Class 3, and have also re-modelled the unreasonable clauses relating to fractions. The "short distance" clause now stands as follows:—

"Where merchandise is conveyed for an entire distance which does not exceed, in the case of merchandise in respect of which a station terminal is chargeable at each end of the transit, three miles, or, in the case of merchandise not so chargeable, six miles, the company may make the charges for conveyance authorised by this schedule as for three miles or six miles respectively."

This has been the subject of much contention, and the present proposal is a gain for the traders to a certain extent, as compared with that of the railway companies. The latter was:—

"For any distance not exceeding six miles the company may demand the rates authorised by this schedule as for six miles."

Short and apparently simple as are the clauses relating to station and service terminals, they will probably be the subject of further discussion, there being still a very great unwillingness on the part of traders to recognise the former of these two charges. They object, for very good reasons, to admit the legality of the particular decision which is supposed to have influenced the Board of Trade in recommending that it should be authorised. Sir Alfred (then Mr.) Hickman, in a letter to Lord Balfour of Burleigh, dated December 20 last puts the case thus:—

"The London and North-Western Amalgamation Act, 1846, is essentially different from the London, Brighton, and South Coast Act, under which the Divisional Court decided that station terminals could be charged; and it is submitted that, reading fairly the judgment of Mr. Justice Wills, it must be inferred that if Hall's case had been under the London and North-Western Act, the decision would have been different. Traders have endeavoured to test the latter Company's powers unavailingly, because the Company have refunded the charges made for terminals, and refused to fight. It should, therefore, be taken as a basis for discussion that at present there is no power to make any charge for station terminals on those parts of the London

Table of Maximum Rates Proposed by the Board of Trade to Apply to the L. & N.-W. Railway.

Class.	Maximum Rates for Conveyance.					Maximum Terminals.					Class.
	For any distance not exceeding 20 miles.	For any distance exceeding 20 miles, but not exceeding 50 miles.	For any distance exceeding 50 miles, but not exceeding 100 miles.	For any distance exceeding 100 miles, but not exceeding 150 miles.	For any distance exceeding 150 miles.	Station Terminal at each End.	Service Terminals. Loading.	Unloading.	Covering.	Uncovering.	
	per ton per mile.	per ton per mile.	per ton per mile.	per ton per mile.	per ton per mile.	per ton.	per ton.	per ton.	per ton.	per ton.	
	d.	d.	d.	d.	d.	s. d.	s. d.	s. d.	d.	d.	
A.	0·90	0·85	0·75	0·65	0·50	0 3	...	...	...	...	A.
B.	1·25	1·15	1·00	0·85	0·75	0 6	...	...	...	...	B.
C.	1·80	1·70	1·45	1·25	1·00	1 0	0 3	0 3	1	1	C.
1.	2·20	2·05	1·80	1·55	1·30	1 6	0 5	0 5	1·50	1·50	1.
2.	2·65	2·50	2·20	2·00	1·60	1 6	0 8	0 8	2	2	2.
3.	3·10	2·90	2·50	2·10	1·95	1 6	1 0	1 0	2	2	3.
4.	3·60	3·45	3·00	2·55	2·25	1 6	1 4	1 4	3	3	4.
5.	4·30	4 05	3·65	3 25	3·00	1 6	1 8	1 8	4	4	5.

Comparative Table of Proposed Maximum Rates.

Distance.		A	B	C	1	2	3	4	5
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
20 Miles	L. & N. W.	2 8	4 10	7 2	10 0	10 11	11 10	13 8	16 4
	Board of Trade	2 0	3 1	5 8	7 9	9 1	10 6	12 2	14 2
50 Miles	L. & N. W.	5 2	8 5	12 0	15 10	17 7	19 9	22 10	27 2
	Board of Trade	4 1	5 10	9 9	12 8	15 1	17 5	20 7	23 11
100 Miles	L. & N. W.	7 3	12 9	17 7	22 6	26 4	30 7	35 9	42 2
	Board of Trade	6 9	9 4	14 9	19 1	23 0	26 2	31 2	37 5
200 Miles	L. & N. W.	13 6	21 1	28 0	35 0	43 0	51 5	60 9	71 4
	Board of Trade	8 10	13 6	19 4	25 9	31 4	37 10	43 8	57 0

and North-Western system governed by the Act mentioned."

Sir A. Hickman is a strong and uncompromising champion of the traders' cause in this controversy, and has taken a very prominent part in bringing it before the attention of Parliament and the public.

Mr. P. Stanhope, M.P., took up the same position in the debate on Friday. In moving the rejection of the Bill on account of the recognition of the legality of station terminal charges, he maintained that the Board of Trade tribunal had in this matter taken it upon themselves to decide what the law had not decided. But supposing this view to be correct, the Board have only done what the framers of the Act (and the Standing Committee on Trade in their turn) ought to have done instead, but shrank from doing. Instead of boldly facing the matter, and proposing something definite, it was left to the Board to deal with, with nothing much in the way of instruction for their guidance, and still less in the way of precedents, the latter being contradictory and of limited application. Sir Michael Hicks-Beach frankly admitted that had he known, at the time he advised Parliament to place this responsibility upon the Board of Trade, the extremely difficult nature of the task, he would have hesitated before making such a proposal. He went on to explain, however, that, although the principle of station terminals had been excepted, yet, as the matter had not been decided by the highest Court in the land, and there existed the possibility of an adverse decision, the maximum conveyance rates were reduced in compensation for the terminals. The extent to which this has been done may be gathered from the appended statements, although, of course, the comparisons are with the 1889 proposals of the companies, and are not based upon their present legal powers. The latter, in truth, are in such a state of chaos that it seems impossible to arrive at any conclusion which does not run the risk of being challenged; the figures resulting from various efforts which have been made in this direction having differed very considerably.

The opposition to the second reading was not pressed, and there will be ample opportunity for making representations (by counsel) to the grand Committee to which the Bills have been referred. They will probably be some time in passing this stage, but there seems to be some hopes that they may become law this Session. Sir M. H. Beach justly observed that it would be a most unsatisfactory termination to an exhaustive inquiry if the question should still be hung up for the consideration of some future Parliament.

CHELSEA POLYTECHNIC INSTITUTE COMPETITION.

THIS is the competition for the first of the proposed South London Polytechnic Institutes. The several sets of plans are on view at present at the offices of the Committee, 47, Duke-street, St. James's. The first place has been awarded to Mr. J. M. Brydon, whose design will we believe be carried out with a few unimportant modifications. A premium of 100 guineas has been awarded to the design by Messrs. Karslake and Mortimer, and one of 50 guineas to that by Mr. A. J. Bolton. The Committee reserved to themselves formally the right of ultimate decision, but they have acted in accordance with the recommendations of their Consulting Architect, Mr. Rowland Plumbe.

More than a year ago Mr. Plumbe addressed to the committee an elaborate report on the general principles to be kept in view in planning buildings of this class; a report founded upon the inspection of a considerable number of buildings of a similar class, and a systematic inquiry into their working. The objects proposed in this report were to provide a form of institute comprising three main branches: first, technical instruction in the principles of science and art underlying the industrial occupations of the people; second, recreative instruction in physical exercises; third, opportunities for social improvement and amusement, it being considered that young people in training for work as artisans would be far more likely to make use of such an institution, as far as the technical training was concerned, if it were made at the same time a place in which healthful physical and mental recreation could be obtained. It must be borne in mind that the technical training is not intended to be such as would be given in the highest class of technical schools and colleges, which are rather preparations for professions than for trades, but such only as is required to fit men and women for the intelligent undertaking of various handicrafts.

In examining into the working of existing institutions of this class, Mr. Plumbe has come to the conclusion that no better model can be found than the Polytechnic in Regent-street, as developed in the last few years by the energy and liberality of Mr. Quintin Hogg; and we believe we may take it that the instructions to architects for the present competition, as well as for others which have followed or will follow it, have been more or less modelled upon the example furnished by the institution in Regent-street.

We have thus to consider a building providing for three classes of requirements, technical, physical, and social, as well as the necessary provision for administration. The following is the schedule of accommodation in the instructions to architects for the Chelsea building:—

		Feet.
Administrative and General Department.		
Secretary's and clerk's offices (three rooms)	Total	1,000
Council-room		230
Store-room, for office use		300
Three master's rooms, total		900
Men's cloak-room, near entrance		500
Women's ditto		300
Kitchen		450
	Total	
Department of Technical Education, &c.		
Boiler and engine-room, and blacksmiths' shop		700
Engineers', turning, and fitting shop		1,100
Pattern making shop		450
Electric workshop		1,100
Dynamo-room		300
Carpenters' shop		800
Bricklayers' shop		600
Plumbers' shop		600
Mechanical drawing for engineering		1,000
Do. do. for building construction, &c.		1,000
Technical library		500
Two lecture-rooms (each 1,200 ft.)	Total	2,400
Two preparation-rooms for ditto (each 250 ft.)	Total	500
Nine class-rooms, varying in size, average say 350 ft. each	Total	3,150
Four music-rooms	Total	800
Band and choir-room		600
Art school—consisting of elementary and advanced drawing studios, life class, and room for model, school of design, modelling-room, wood carving, and metal chasing, &c., room	Total	4,000
Photographic studio, printing, and dark rooms		800
Advanced chemical laboratory		800
Elementary do do.		800
Physics laboratory		500
Three women's class-rooms	Total	1,000
Women's school of cookery		400
	Total.	
Department of Physical Education.		
Swimming-bath (pond, 60 ft. by 25 ft.)		2,450
Attendant's room		100
Gymnasium		2,450
Attendant's and master's room		200
Two locker rooms (750 ft. each)	Total	1,500
Women's gymnasium		800
	Total.	
Department of Social Recreation.		
Men's refreshment-room		1,000
Women's do.		450
Reading-room for men		1,000
Do. do. women		400

Department of Social Recreation (cont.).	Feet.
Club-room for men	1,000
Do. do. women	540
Men's social room	400
Members' committee-room	400

In addition to the above, a large hall with large platform and organ chamber for lectures, orchestral and choral music, and other entertainments, must be provided; it must hold 1,200 in the auditorium, not less than 700 on the ground floor, and the remainder in galleries. It must have ample access from the main building, and in addition it must have separate accesses and staircases from the outside, and escape staircases and exits, &c., all as required by the rules of the London County Council in order to obtain a certificate for a public building having a licence similar to other buildings used for musical, dancing and theatrical performances. There must be ample accommodation in separate rooms for male and female artists, male and female choir rooms, and rooms for the orchestra, together with urinal, w.c., and lavatory accommodation all apart from the main building."

There can be no question that the design marked "G," by Mr. Brydon, is by far the most simple, convenient, and compact in plan, of the six exhibited. Mr. Brydon places his entertainment hall on the ground-floor, on the central axis of the building from back to front, the gymnasium and swimming-bath parallel with it to right and left; these three, with the stairs arranged in front of the bath and gymnasium, forming a central block round which there is a continuous corridor. The bath and gymnasium, however, are sunk into the basement, and lighting is got for the side corridors from the upper part of them, while the hall again is lighted over their roofs. The left-hand corridor is a "women's corridor," with a women's entrance facing the end of it, the right-hand one is similarly a men's corridor; the left-hand part of the front corridor is also partly devoted to women (cloak-rooms,) and the right-hand portion to men. The central entrance is a general one, with the secretary's office and members' committee-room on each side of it. The back corridor on ground-floor is a music corridor (musical class rooms, &c.), and is shut off by doors at each end. In case the large hall were used for entertainments open to the outside public, the central entrance would be convenient for this, but it seems probable that it would rather be used for those connected with the institution. The assessor points out that the concert room itself would need some kind of vestibule to prevent the sounds of a concert from disturbing other occupations going on in the building.

The front block alone of the building is carried up above the first-floor level (excepting the upper part of the large hall). On the first floor are class-rooms facing to the front of the building, which have a north-east light, though this information is not to be got from the plans, which, like most of the others, show no north and south point, for which we are indebted to the author of the set marked "B," who has not forgotten this necessary item of information. In the second floor are the modelling and drawing-rooms and life class-room, which are all top-lighted. The basement, which has a large sunk area in front of it, is used for the technical workshops, which are approached by flights of steps from the street into the area at each extremity of the boundary railing. The heating chamber and various cellars are placed under the large hall. The lecture room is on the first floor in front, opposite the gallery entrance of the hall. As the plan now stands, it is obvious that a lecture could not be given under satisfactory conditions, while a musical entertainment was in progress in the hall. We do not know whether it was contemplated that the two should be in use simultaneously; but if it is, this part of the plan would certainly have to be modified. We should have preferred also to have seen the latrines kept more separate from the main building, instead of merely opening out of a corridor among a range of other rooms in the basement.

The superior points in the plan, and which give it its special character, are the continuous and simple disposition of the corridor plan, and the admirable sectional arrangement of the hall, swimming-bath, and gymnasium, whereby light is obtained to passages which on the plan alone seem dark and confined. The elevation is of what may be called the Chelsea type, which the architect has made use of in other buildings in that locality; there is a central pediment with columns rising from the first floor level, a rusticated doorway with the usual segmental tympanum beneath, and six equally-spaced windows on each side of the centre, with rusticated quoins, and pediment heads to the upper windows; on the ground floor the space of one window on each side is occupied by the men's and women's entrance door respectively. The effect of the building is shown in a fine perspective in line drawing; it is no doubt somewhat square and heavy in effect, and perhaps would look more so in execution than when set out by the effective handling of the drawing; but it is dignified in appearance, and unquestionably the idea of an "Institute" (of one kind or another) is written on every line of it—as the architecture of Institutes is usually understood.

So much cannot be said for the exterior architecture of the second premium plans ("E"), which, with its toothed outline of three large gables and six small ones, rather suggests model lodging-houses than any kind of public building. The plan is rather straggling, and some of the departments depend for light and air on rather small internal court-yards. From the centre entrance a corridor leads straight through the building to the back, out of which open lecture-rooms on the left, and class-rooms on the right; the light of the latter must be rather overshadowed by the hall, which is at the extreme right of the buildings, and the lavatory opens direct out of the same corridor, next the class-rooms, in a rather unconsidered manner. The large hall is well planned for the principal entry; the music-rooms are placed underneath it, out of the way of annoyance to other parts of the building by practice, but also rather out of the way in point of access. The swimming-bath is at the south-west angle, reached by the long corridor from the centre entrance, the first-floor one leading to the bath gallery. The principal staircase, near the entrance to the large hall, is a good and roomy one. In general, we cannot quite see the reason for the position assigned to this set of plans.

In the third premiated set ("B") the central entrance leads to a staircase, up by the centre flight to the large hall, and down (by the two side flights) to the corridor leading to the music rooms, which (as in set "E") are shown with double walls with a cavity, for preventing or at least checking the transmission of sound from one to another. The Swimming Bath is across the centre of the buildings behind the hall, the gymnasium at one side. This arrangement leaves the Hall rather curtailed in its proportions. The buildings are spread in rather an irregular manner over the site, leaving a good many small irregular angles and nooks in the open courts; the men's "social room" looks on to one of these small courts; not a very interesting outlook, the front would be better, unless Manresa-road possesses a very continuous and noisy traffic. The women's department and entrance is at the right, with class-rooms on the ground-floor and gymnasium, and lavatory, &c., below; this department being cut off from the rest of the building. In the main we should consider this a better plan than "E." The elevation is a rather picturesque and elaborate one, apparently designed for brick, with turrets large and small, shown in a carefully-executed but rather over-worked drawing. It is the best elevation next to the selected one. The rooms for the art classes at the top are well arranged with top-lights only; "E" combines top light and side light, which we do not think desirable. The life class-room is a good square one, the best shape for a life class room, as the model should be as central to the students as possible; a long room is not a good shape for the purpose.

Of the unpremiated sets of drawings the best are those marked "A," the author of which has gone on the principle of isolating the hall and the physical department. The class-rooms of various kinds occupy a front block to the road, a corridor and covered way lead through to the large hall which stands in the rear; and on either side of it are the swimming-bath and gymnasium respectively, unconnected with the main building, and reached from an external entrance from the open courtyard. The isolation of the hall is a gain, in the way of keeping performances in it from interfering with the work of the building, and there is something to be said for the isolation of the swimming-bath and gymnasium; there is nothing to object to in this in fact, but of course it involves want of economy in building. However, the plan has an idea in it.

NOTES.

SINCE the fresh attention recently directed to the Architects Registration Bill it is satisfactory to observe that the daily press is beginning to see the folly of it, and to turn round and oppose it. As far as the Institute of Architects is concerned Mr. Waterhouse's plain and logical letter in the *Times* of Monday puts the matter in the right position. Mr. Waterhouse points out that the Institute has never been guilty of the folly of supposing that a student can be manufactured into an artist by mere industry in preparing for examinations:—

"It recognises the fact that an architect ought to be many-sided. He should be an artist, a man of science, and a man of business. The Institute cannot make an artist of him, but it can see that, before he enters its ranks, he shall have a knowledge of certain scientific facts and business matters, which are as necessary for architects as artistic attainments. The distinguished painters who have signed the memorial do not deny the propriety of their students being required to study anatomy, and yet the most profound knowledge of anatomy does not make the painter-student into an artist."

It is to be hoped that Mr. Waterhouse's letter will avail to undo the mischief which has been done by the memorial to which we referred to last week, in which, by the uncalled-for and groundless suggestion that the Institute was only opposing the Bill because it desired to bring in a similar measure of its own, the memorialists actually played into the hands of the very persons they were opposing. A letter from Lord Grimthorpe, which followed modestly in small type at the heels of Mr. Waterhouse's letter (a sign of the times this!), is as usual amusing reading, in its characteristic endeavour to say something unpleasant about all parties, those whom he agrees with and those whom he disagrees with alike. Of course we are told that a number of persons have expressed a wish to know Lord Grimthorpe's opinion on the subject; but, as usual, they are anonymous persons who are too modest to express themselves publicly. It would be interesting to know who are the persons who value Lord Grimthorpe's opinion on the subject of "Architecture an Art or a Profession." We have never heard of them. It is interesting, however, to note that Lord Grimthorpe is of opinion that the public cannot be protected by any legal enactments against bad design in architecture. Lord Grimthorpe, therefore, is safe, however the public may suffer.

WE feel bound to enter our protest against the manner in which the Press, and especially the technical Press, is treated by the London County Council in the matter of the issue of important reports. On two or three occasions documents of great moment have been prematurely communicated (by members of the Council, we believe, and not by the officials) to one or two favoured journals. We will mention two instances, both of them relating to reports of the utmost importance. Mr. Binnie, the Engineer of the Council, on the 8th and 29th of October last submitted to the Council's Special Committee on Water Supply two

reports on that question. These reports were only "ordered to be printed and submitted to the Council" by the Committee on December 15, 1890; yet a summary of them appeared in a monthly journal dated November 15,—just a month earlier. This premature disclosure of important documents is neither conducive to the dignity of the Council nor to the public interest. The second instance we have to refer to is that of the report of Sir Benjamin Baker and Mr. Binnie on the main drainage question. Although this report was not formally before the Council until Tuesday last, when its consideration was adjourned, it was prematurely communicated by some member to the *Times*, and appeared in that journal on Saturday last. We must leave it to the Council to take steps to guard its own dignity and the interests of the public against this premature disclosure of documents; but what we have especially to complain of is that even when important reports of this kind are actually before the Council, it is very difficult, even by repeated application, to get copies of them, and up to the time of going to press we have not been able to get a copy of the report on the main drainage question. Why cannot the London County Council adopt the practice of the Houses of Parliament? When a Bill or report or other public document is issued to members it is also issued to the Press and to the public. If it is deemed necessary that a Parliamentary Bill be issued to the Press for publication and comment before it is discussed in Parliament, is it not equally necessary that reports recommending the expenditure of millions of money on engineering works should be issued to the technical press concurrently with their issue to the members of the Council? We know that there are a few engineers on the Council, but we should have thought that they would have been glad to have the opinion of constructional and engineering journals on proposals of such vast moment to the inhabitants of London.

We alluded last week to the report of the Manchester Corporation as to the Ship Canal. This week we have to note that the Corporation has unanimously approved of that report, and recommends that the City of Manchester should assist the Canal by advancing a large sum on the security of debentures to complete the undertaking. The ratepayers have now to ratify the action of the Corporation, and if they do so, a bill will be applied for by the Corporation. But the more the matter is looked into, the more dangerous does the action of the Corporation of Manchester appear. They establish a precedent of the largest application, and they risk the possibility of permanently burdening the ratepayers with a useless asset. It may be that the Ship Canal will ultimately become a commercial success, as we hope may be the case. But at present its promoters have been misled on the fundamental element in its success, namely, its primary cost. When the undertaking begins to compete with the great railway companies and with the Liverpool Docks, it is well within the bounds of possibility that it may be found altogether, or very nearly unremunerative, and that its promoters' forecasts may be again untrue.

The case of Barrow *v.* Isaac & Son, which is reported in the current number of the Law Reports, deserves to be noted, before it passes away into the legal records, as a warning to persons to be careful in regard to the sub-letting of premises. The lease in this case contained a covenant not to sub-let without the consent in writing of the lessor, a very usual feature in every lease. But the lessees did sub-let, without this consent, by the forgetfulness of their solicitor. The sub-lessee was a perfectly respectable person, and according to the terms of the lease the consent of the lessor was not to be arbitrarily withheld. Therefore, if the lessor's consent had been asked in the first place it would have been impossible for him to withhold. But there had been a technical breach of the covenant in the lease, and so the landlord was entitled to re-enter and take possession of the premises, and he accordingly brought an action for this purpose. It was held by the Court of Appeal, affirming the judgment of Mr. Justice Day, that the lessor was entitled to have possession of the premises. No doubt the judgment is technically correct, but it somewhat shocks common-sense ideas that a person should be able to re-take possession of land when it is obvious he is suffering no damage or loss whatsoever. Under the Conveyancing Act, 1881, a lessee has in some cases, such as breach of a covenant to insure, an opportunity of putting himself right by payment of money. But covenants against assigning or under-letting are specially exempted from the Act and are left to the ordinary operation of the law. But it would certainly be a step in the right direction to enact that in order to justify a right to take possession when a sub-lease has been made without the consent of the lessor, the latter must prove that the sub-lessee was not a fit person, or one whom, in the first instance, he would have taken as a tenant.

From a portion of the report on the main drainage of London, made to the County Council by Sir Benjamin Baker and their own Engineer, Mr. Binnie, which has appeared in the *Times* (though we understand not officially communicated), it appears that these eminent engineers recommend the continuation of the system of chemical precipitation of the sewage, and removal of the solid matter out to sea, as the best course for the present, though not to be regarded as a final one. From the continuation of the present operations they anticipate great improvement in the state of the river. They add that it is in their opinion "essential to direct the most serious attention to the constantly increasing abstraction of upland waters by the various water companies, which they consider to be a most potent cause of many of the grievances complained of in the middle and lower reaches"; an opinion which has an important bearing on the question of London water supply which is receiving so much attention at present. They consider that the low-level sewer on the north side of the Thames is taxed far above its present capacity, and that two new sewers should be constructed on the north side of the Thames and one on the south, and that the capacity of the outfalls should be increased to a corresponding extent.

Herr Anton v. Werner, the President of the Berlin Committee arranging the International Art Exhibition, has made some statements referring to the basis on which his Committee worked in regard to its invitation to France to exhibit. Referring to his intercourse with the French Embassy on the subject, Herr v. Werner says, first, that it was not of his own accord, and very much against his ideas, that he had asked M. Herbette to take the matter in hand: he had done so by the special request of the Paris Committee managing the proposed French group, who had wished to have at least the semi-official approval, if not the assistance, of their Government; and, secondly, he states that the intercourse he did have with M. Herbette was of a private nature, and by no means officially for the Exhibition Committee, as generally supposed. Herr v. Werner's remarks on the subject, which have been published in full, whilst showing contempt for the manner in which the French artists have bowed to party opinion, show also how disappointed the President of the Committee is at such a serious gap in what he had planned to be a real international exhibition, and that he still hopes that matters may be mended before the opening day.

At the Carl Winckelmann Festival of the Archæological Society at Berlin (No. 50), Dr. Fürtwangler read an important paper on extant works of sculpture which he held to be more or less close copies of statues by Kresilas, the contemporary of Pheidias. Of these he enumerated no less than ten. 1. The well-known Herm of Perikles. 2. The statue of the wounded Amazon, already connected with the name of Kresilas by Jahn. 3. A marble head in the Berlin Museum (in the catalogue No. 311), said to be similar in style to the Perikles, but whose characteristics we cannot recall. 4. A Diadumenos, of the head of which there are replicas both at Dresden and Cassel, and the body of which is preserved in the little terra-cotta published in the Hellenic Journal, 1885, vol. 61, and also in a marble torso at Berlin. 5. A youthful helmeted head of Ares, of which one of the best copies is in the Louvre. 6. The Diomedes of Munich (Glypthothek 162). This statute had been already independently attributed to Kresilas by two high authorities, Drs. Loschke and Studniczka, while Winter attributes it to Silanion. 7. The so-called Alcibiades in the Sala della Biga in the Vatican, which is possibly the statue of a runner. 8. The Athene Velletroi of the Louvre. 9. The Medusa Rondanini of the Glypthothek, a work in which, according to Dr. Fürtwangler, the artist's individual characteristics most clearly come out. 10. A diadumenos head of the Petworth collection. A close analysis of the characteristics of eyes, forehead, hands, feet, of the proportions of the limbs, and, in fact, of every detail, followed. This, naturally, could only be appreciated in a cast museum, where reproductions of the several statues are at hand. Dr. Fürtwangler concludes that Kresilas was strangely influenced in externals by Polycleitus, but that his own genius was more analogous to that of Myron,—a conclusion practically the same as that which Dr. Brunn had arrived at on literary grounds.

It has been already noted in our columns that it is the intention of the Municipality of Paris, in its future purchases from among the works at the annual Salons, not to confine itself to the purchase of painting and sculpture only, but also to purchase objects of decorative art. In reference to this the association of "Architectes Diplomés par le Gouvernement" have addressed a memorial to the Municipal Council, praying that the designs or models exhibited by architects may be classed among the list of works open to purchase by the Municipality. They observe that "these works, nearly always decorative in character, are of interest to all classes of industries, and might advantageously be utilised in the museums and libraries of the city, as well as in schools of art, in which the Municipal Council shows so much interest." In all which there is a good deal of truth, and perhaps a public body in Paris may be able to understand the interest and value of a good architectural drawing. It is almost too painful to think what would be the reception of such a petition addressed to the London County Council or the City Corporation.

We have received the first number of the *Health Record*, a sanitary journal for Ireland, published in Dublin. It is gratifying that there is encouragement for such a journal in Ireland. We learn from the column entitled "Health in the Home" that the Dublin Ladies' Sanitary Association has taken an active interest in this subject, though apparently with but meagre support, and that one lady, Miss Mary Todd, is giving a series of "Health Lectures" at a school at Ardnagreena, to which girls and young women are admitted at a charge of 6d. each, and that these are well attended and promise to be a success. Among the original articles of the number is one on "The Development of our Health Resorts and Watering-Places," urging that a movement should be made to render the watering-places of Ireland more attractive to visitors, considering that they already possess in an exceptional degree the two great desiderata for health resorts; viz., unrivalled purity of air and water.

IN regard to the state of some of the houses of the working-classes in Windsor, to which public attention was again directed the other day by a question in the House of Commons, the Rector of Windsor, the Rev. Arthur Robins, writes to us:—

"A reply recently given in Parliament by Mr. Ritchie to a question concerning one of the worst of the Windsor slums calls for more attention than it has received. After an inspection of the Royal borough by the Local Government Board, it was reported in 1887 that the older courts and alleys of Windsor, to which the *Builder* had long before called attention, were in all or in some respects 'still pitiably bad.' Of South-place, perhaps the most conspicuously corrupt of all these rookeries, it was reported,—'of thirteen houses on the south side ten have no opening whatever at the back, no scullery, and no closet; we see no way of rendering them tolerably habitable but by demolishing every third house, and converting its site into a yard for its neighbours, with a proper closet to each.' In a supplementary report, after revisiting the spot, issued in January last year, the inspectors emphasized the fact that their recommendation had been wholly disregarded, inasmuch as they found that 'the dwellers in the houses on the south side are still under the necessity, for closet purposes, of crossing over into one or other of the back yards on the north side.' The same terrible necessity exists at this moment. Whilst this, of course, reveals all the possibilities of the most appalling immorality, and whilst, moreover, these ten houses are actually at this present absolutely without any sort of sanitation whatever of their own, Mr. Ritchie, nevertheless, in Parliament a few days ago, in answer to a question put by Mr. Leveson-Gower for Earl Compton, stated, without any protest or rebuke of any kind, that he had been 'informed' that the sanitary accommodation of these ten houses was 'not inadequate.' The slums of Windsor, thus officially protected, close to the Castle walls, are not unlikely to remain, as they are to-day, 'still pitiably bad.'"

IN a communication to *Notes and Queries* of 28th ult., Mr. J. F. McRae directs attention to the demolition, as then in progress, of "Goldsmith House," in Goldsmith-road, Peckham, which he describes as being "a very likely looking building" in connexion with the fact that Goldsmith is known to have once served as an usher at a boys' school in Peckham. In Mr. Walford's "Old and New London," vol. vi., f. 289, we read that the school-house in question, Dr. Milner's, was pulled down in 1876. This statement, too, is repeated in a recent edition (1889) of Mr. Laurence Hutton's "Literary Landmarks of London." In March, 1876, was announced for sale at auction the unexpired lease, for 226 years, of "Goldsmith House, formerly the residence of the celebrated poet, Oliver Goldsmith, situate in Goldsmith-road, Peckham . . . . with one acre of land," &c., and the sale was duly completed. John Milner was pastor of Hanover Chapel, Peckham (rebuilt in 1816), from 1741 until his death in June, 1757. According to E. W. Brayley's "History of Surrey," vol. iii. (1841), he "kept a school in Meeting House-lane, in what is now called 'Goldsmith House.'" Brayley goes on to say that Goldsmith was usher there between the years 1751 and 1754, but the late John Forster, in his life of the poet, adopting, upon good *data*, a later date, fixes his stay at Dr. Milner's as for an interval in 1757. He says, too, that before the end of April, in that same year, Goldsmith had covenanted to leave the school, to board and lodge with Griffiths, the bookseller (whom he had met at Milner's), and devote himself for one year to the "Monthly Review."

THE new scheme for Christ's Hospital, to which we adverted in a "Note" on December 21, 1889, came into force on the first day of January last, when the Council of Almoners entered into office. The governing body have already applied themselves to their duties by inviting offers of sites in the country for the "Hospital" boarding schools—that is to say, one for 700 (and more hereafter) boys, one for 350 girls, and one (preparatory) for 120 boys. Each site proposed should consist of not less than 250 acres, and lie within an hour's journey, by rail, from town. The existing premises in Newgate-street stand upon a little less than five acres of ground,—more, perhaps, than is needed for the two day schools for boys and girls to be established under the scheme. At the present time the Hospital Council have at command an income of 60,000*l.* a year; and, setting aside the now preparatory school at Hertford, it has been estimated that the sale of the Newgate-street property would realise enough to provide for the two day schools and the two boarding schools for boys.

WE understand that, after an interval of nearly five years, the project of pulling down the Spanish and Portuguese Synagogue in Bevis Marks, and letting or selling the site, is again revived. This is the synagogue of the Sephardim Jews, as distinguished from the neighbouring German and Polish community, or Ashkenazim, who worship in the Great Synagogue, rebuilt in 1790, in St. James's, *olim* Duke's-place, by Aldgate, James Spiller, architect. Five years since the wealthier members of Sephardim built a synagogue in Bryanstone-street, W., Mr. H. H. Collins, architect. At Bevis Marks the late Sir Moses Montefiore was appointed "elder" in 1814. This congregation claims to be the oldest of its kind in England since the Commonwealth, when their predecessors established a synagogue in King-street, hard by, in 1652. The present one, which, with its schools, almshouses, and offices, stands at the corner of Bevis Marks and Heneage-lane, was built in 1701, Dr. Nieto being then Chief Rabbi. The interior is a good example of the style of that day, and therein are still preserved, we believe, a beam presented by Queen Anne, and a fine candelabra of old Dutch workmanship. Bevis Marks is supposed to be a corruption of Bury's-Marks; the property here of the Basset family passed to the abbots of Bury; whence Bury-street, and, probably, Mitre-square; and after the dissolution to Thomas, and his son, Sir Thomas Heneage. Sir Thomas Heneage, Chancellor of the Duchy of Lancaster, was buried in old St. Paul's, 1595.

AS the lease of No. 12, Lincoln's Inn-fields expired last year, the trustees of Sir John Soane's Museum, being vested owners of the property, have been enabled to make some advantageous changes in the museum itself, which is preserved in the adjoining premises. Two additional ground-floor rooms have been built at the back of No. 12, after designs made by Mr. Wild, the curator, in harmony with the general style of the interior of Soane's own house; and the basement rooms have been re-arranged. The increased space and light thus gained will provide for the better exhibition of many of the objects,—now crowded together,—in that part of the museum. Hogarth's "Rake's Progress" is hung, in company with his set of the "Election," in the "Hogarth" room; and the large model of Pompeii has been removed to a more convenient place. Soane built this house for himself in 1792, and in 1813, No. 13 where he died on January 20, 1837. It is stated that he, the son of a bricklayer at Reading, began life as an office-boy, and then pupil, to G. Dance the younger, in whose household Soane's sister was servant. He entered Holland's office, whence, in 1776, he gained the R.A. gold medal and travelling studentship. He bought the "Election" for 1,650 guineas, at the sale of Mrs. Garrick's effects; and gave 570 guineas for the "Rake's Progress." He is said to have spent 60,000*l.* upon the entire collection.

A CORRESPONDENT sends us a copy of the New York *Sun*, containing a rough engraving, with a long description, of a portentous building designed by Mr. Bruce Price, the eminent New York architect, for a business building of thirty-two stories, and nearly 450 ft. high. We gather that the design is a speculative one only, to show what might be done on a site of small area. It takes the form of an immense campanile, the greater portion being sternly plain except a portico at the entrance, and merely pierced with rows of square-headed windows. At the top is a gigantic cornice, and over that a colonnaded gallery with its own entablature, and a smaller block with a pyramidal roof over that. The building is proposed to be a combination of steel and masonry, faced with terra-cotta. The structure is designed mainly with the object of furnishing a good return for the ground occupied and the expenditure in building, hence the plain character of most of the work. A grand thing might be made of such a towered building, architecturally; but judging from the rough print published in the *Sun*, we do not think the architect has made the most of the opportunity, even within his economical limitations. The decorative portion at the top looks heavy and devoid of invention and picturesqueness; and the colonnaded porch at the foot, large as it evidently is in actual size, seems crushed by the main building, with which it appears to have no architectural relation. There is an evident leaning towards experiments of this character in America, and we should expect that one or more will be carried out before long. There is no reason why they should not succeed, and even be at the same time works of architectural grandeur, but they must not be multiplied too much in a city. One or two would do no harm, except to the houses and streets in their immediate neighbourhood.

THE collection of drawings by Mr. Parsons at the Gallery of the Fine Art Society seems to be intended as another set of garden pictures; at all events his subjects run very much into gardens, and these are the best of the collection. Perhaps quite the best is the one hung on the centre of one of the walls, under the title "The Light that Failed" (15), a garden shrubbery walk with masses of dark trees standing up on each side of the picture, showing a faintly-lighted saffron evening sky between; in the foreground a girl in a scarlet dress reclines on a garden seat, this piece of strong colour producing a remarkable effect in contrast with the dark trees and the faintly-lighted sky. The sunflowers against the wall are not without their effect on the whole. It is rarely that one sees a water-colour which combines so much of nature with so much of decorative effect. We call this small picture a remarkable work of its kind. "Red Apples" (14) and "Guelder Rose, Bodenham" (16), combine interesting figures with flowers and foliage. "Michaelmas Daisies" (23) is a fine piece of flower-painting. "A Hill-side Orchard, Holme Lacey" (26), is a wilder and more free style of landscape. Among the gardens is a charming bit from "Canon Swayne's Garden, Salisbury," with the cathedral spire rising above the masses of flowers. "The Terrace Walk" (52) is another beautifully-painted garden scene, but the old house which appears in this and one or two other drawings is not very satisfactorily painted; the architecture is smoothed out and devoid of texture. The most remarkable illustration of the beauty of artificial garden scenery is shown in "The Gay Garden, Holme Lacey" (45), a wide parterre of gay and gaudy flowers in symmetrically-arranged beds, backed by great square masses of green hedge; two or three female figures as brightly arrayed as the flowers seem to go naturally with the rest of the scene, which looks like the site for a modern Decameron.

WE have received from Mr. George Ord, architect, of Durham, a correspondence between himself and the Committee of the Freemen of Newcastle-on-Tyne, which we have not space to print, but which calls for strong comment. The Committee advertised in the Newcastle papers as follows:—

ERECTION OF COW BYRES ON THE TOWN MOOR.—The Stewards' Committee of the Freemen of Newcastle-upon-Tyne have decided to offer premiums of 10*l.* 10*s.*, and 5*l.* 5*s.*, respectively, for the *two best designs* (in order of merit) which shall be sent in to them for the erection of byres on the Newcastle Town Moor, to accommodate 100 cows, at a cost not exceeding 1,250*l.*; the following conditions to be complied with:—The requirements of the Local Government Board, the Public Health Act

and the sanitary by-laws of the city must be strictly adhered to and carried out. The plans must show the elevation, section, and ground-plan, and will remain the property of the Committee, and must be sent in under "Motto," no name to be disclosed. Any one transgressing this condition will be excluded from the competition. If the work is gone on with, the successful competitor will have the carrying of it out. The Superintendent of the Town Moor (Mr. Alex. Sinclair, New Bull Park), will point out the piece of ground, an acre in extent, where it is intended to erect the byres, at any time on application. Plans to be sent in addressed to the Stewards' Committee of the Freemen, 4, Brunswick-place, Newcastle, on or before October 1 next.—Brunswick-place, Newcastle, September 3, 1890.

Mr. Ord competed, along with other architects, for this modest premium, and in course of time received an official letter informing him that the committee "regretted that his plans did not come up to the required standard." Mr. Ord wrote to enquire what competitor had been selected, and also if the committee had made any arrangements for the return of the unsuccessful drawings, and was told in reply that if he would refer to the advertisement he would see that the plans were to remain the property of the Committee! This we think pretty well surpasses anything we have previously met with as to the shabby and high-handed treatment of architects by Competition Committees. It is true that grammatically the wording of the advertisement would read that all the plans were to remain their property, but it would probably hardly occur to any competing architect that a Committee could deliberately invite architects to compete for such a miserable premium, and intend in addition to impound all the drawings sent to them, whether premiated or not. Our correspondent writes in considerable indignation, which we fully share. The proceeding is discreditable to the Committee whether considered in the light of common sense or common fairness, and as far as we know is altogether unprecedented in the annals of architectural competitions.

DRAWINGS AT THE BRITISH MUSEUM.

The collection of drawings now exhibited in the large Print Exhibition Room of the British Museum, and which has superseded the collection of Japanese drawings which have been on view there for some time back, is a remarkable one in its variety of interest, and gives some idea of the hidden riches of the Museum in works of this class, generally only known and accessible to the comparatively small class of people who obtain admission to the Print-room for special study. It is to be hoped that the new gallery will be utilised for a succession of such displays yearly, so that all the contents of the Print-room may, in course of time, be passed before the notice of the general public.

The architectural drawings in the collection are not numerous, but include some of considerable interest. Among them are two drawings by Du Cerceau, one for one of the court façades of the Louvre, the other for the court of the château of Verneuil. Both are of remarkably neat draughtsmanship for the period to which they belong; the Verneuil drawing is a peculiar combination of elevation with perspective, the front plane of the building with its order being in geometrical elevation, while the colonnade in the rear of the ground-story is shown in perspective, its lines radiating from a vanishing-point at the axis of the elevation. The architectural ordonnance consists of an order of coupled columns or pilasters on the ground-story, with arches between, and large shallow pilaster-like projections in the upper-story, surmounting the coupled pilasters and decorated with niches and figures; a very richly-decorated balustrade crowns the entablature. The effect of the whole is unfortunately spoiled by the hideous collections of masks and trophies which form acroteria over the piers of the balustrade. The central bay is emphasised by a semi-circular *fronton* carried by two couples of female caryatide figures remarkable for the disproportion of their figures, the heads being absurdly small for the height of the figures. It is a far inferior piece of architecture to the Louvre in point of architectural refinement. Another interesting drawing of Du Cerceau's is the view of the "Chasteau de Boullongne," now destroyed; the title is too literally given in English as the "Castle of Boulogne," which is hardly the real equivalent of "château." This is a prim and hard perspective view of a high-roofed sixteenth-century château, with a rich architectural treatment interrupted at intervals by perfectly plain turrets with only a single set of windows on the centre line. A remarkable specimen of Du Cercean's work is also a drawing, very carefully executed in line, with slight washes for shadows, of six figures of "Assyrian monarchs," which formed the sculpture decoration in the niches of the upper story of the Verneuil elevation before mentioned. Here also the heads are too small, but there is great spirit in the drawings and a great deal of power of expression in the heads.

Near these are two large London sketches of Canaletti's, one of St. James's Park looking towards Spring-gardens, the other of Old Westminster Bridge, looking towards Lambeth. Both these are admirable specimens of architectural sketching on a large and elaborate scale, lined in with pen and faintly washed with Indian ink or some such tint. They are valuable drawings in a historical sense as well as in point of artistic power. Canaletti's rival, Guardi, does not come out nearly so well in this type of sketching; there are two Venetian views by him close to, showing perhaps greater freedom and atmospheric effect, but not nearly so precise and careful in the indication of details. Fancelli's two drawings of the entrance-gate to the court of the Ducal Palace at Venice, and the interior of the court, are drawings of a different order, fully shaded in a warm brown tint and very rich and artistic in effect.

The collection of Italian drawings, of which these form a portion, extends over one end wall. It includes many drawings interesting either as curious or beautiful, or both. Among the things of special interest may be mentioned various drawings by Luca Signorelli and Michelangelo; a pen study of a tree by Titian, some studies by Baccio Bandinelli and other names of less familiarity. Among the German and Flemish drawings on the side wall is a curious specimen of Israel van Meekenen, a man in armour with his back to the spectator, and an unfinished pen drawing by Dürer of Apollo and Diana. Several portraits by Dürer are here, one very fine one is that of Lord Morley, a crayon drawing on a very dark toned paper. Among the later Italian drawings is a very interesting set of rather slight colour sketches by Stefano della Bella for costumes for a masque of Hypermnestra; curious relics of the taste of the time. Thetis and Venus are robed in rich Renaissance dresses; the Furies have a kind of ballet costume with hideous masks and short skirts of flame-like character. A set of sketches of the pranks of Centaurs and Satyresses, by Tiepolo, are of value as among the many curious indications to be found in sketches of the period, as to the essential Paganism of taste in the Renaissance mind. Among the Dutch drawings are some admirable specimens of Van Huysum's flower drawing, and also some very carefully-executed flower-drawings by Holzbecker, who worked in the middle of the seventeenth century in the Province of Meissen. These are various coloured studies each of a single flower with a piece of stalk and leaf, coloured with the greatest minuteness, hard and formal in effect, but most conscientious as studies.

Of the old drawings none are of more interest as bearing on the character of the Renaissance period, its rich but extraordinary and half-grotesque fancies, than the set of pen-drawings by Maso Finiguerra, a set of illustrations to "A Chronicle of the World," exhibited in a special case by themselves. These are Florentine, of the fifteenth century, and a more curious and characterisric set of designs it would be difficult to imagine. Here, in this chronicle of the world as it appeared to the Florentine mind of the period, we see the elopement of Helen with Paris represented by the figures of a lady and gentleman walking arm-in-arm beneath a circular Classic temple or shrine, with columns the surface of which is covered with decorative leafage, and which has a Classic frieze with a procession of cupids carrying or entangled in "swags." The perspective of the circular cornice is wrong (of course), but the frieze is drawn with the greatest spirit. "Apollo Medicus" is represented by a figure in a kind of Jewish high priest's robe and mitre, standing in the middle of a circle inscribed on the floor, outside of which stand two of the most extravagant little demons or familiar spirits, looking like the grotesque beings of Renaissance ornament called into life. "Jephtha sacrificing his daughter" has a helmeted head like those seen in some of Lionardo's studies, and raises a great scimitar to smite off his daughter's head. "Virgil and Aristotle" appear in embroidered robes and with head-dresses which are a combination of the turban and mitre. The whole set is about as curious an example of the exuberant Renaissance fancy as could be seen.

Two walls and all the floor cases are devoted to drawings of the British school of the present century, and a remarkable collection they make: we can only indicate a few of the principal things of interest. Among the early drawings names come up that are unfamiliar enough now. There is a powerful sketch study of trees with the name of S. W. Reynolds. The back of the same case is devoted to a whole series of small and rapid sketches by Constable, illustrating his manner of noting down effects rapidly: some of these are very fine. It is interesting in the next case to come across Peter de Wint's name attached to still-life studies and a view of Crewe Hall; some of his landscape studies are also shown. Two sepia sketches of John Martin's remind one of a vanished reputation; one of them, "Warrior Defending his Family from Wolves," is too amusing to pass over; scene, a rocky glen of the Martinesque type, wolves larger than lions of the present day, and so on. Prout's pencil sketches of buildings come out well; it is interesting to see his architectural drawing in this form, in which it looks far less mannered than with the brown tint on it. Wilkie is represented by a drawing of Edinburgh old town by night, a nude study, and a sketch portrait of the Duke of Wellington; a tolerably varied illustration of his powers. C. R. Leslie's portrait of the Duke, next to this, as an old man standing and partly turned away from the spectator, is very beautiful and dignified. A portrait of John Crome by John Sell Cotman is not a thing to be passed over, though it is not flattering to Crome.

William Hunt and John Frederick Lewis have one side of a case to themselves. Then we come to some architectural artists; Charles Wild, (a rather hard but careful interior of Henry VII. chapel), David Roberts, James Holland. How many readers know of John de Capelain, who "worked in Jersey, the Isle of Wight, and London" 1814-48? The one example of him shows the same kind of style and feeling as Cotman, a small seaside piece with much picturesque power in it. Clarkson Stanfield's "View of Broadstairs" is an admirable sketch, as a sketch. Kenny Meadows's little coloured subjects from everyday life of his period are curious to look at now: not without a finish and merit of their own, but representing, both in an artistic and social sense, a taste that has entirely passed away. There is a greater interest about the case of works by Edward Calvert, another nearly forgotten name, though he died in 1883, being then a year older than the century. There is a great deal of beauty and poetic suggestion in his classical landscapes and figures, seen through a kind of golden haze; there is a strange handling in regard to colour and texture which reminds one of Blake's manner (or one of his manners) in water-colour.

The English collection on the walls commences with some interesting crayon studies for portraits by Lely, Kneller, and some of their followers, including a life-size sketch by Jonathan Richardson (1665-1745) for a portrait of the noble head of Purcell. A few Hogarth drawings are there, and some of John Collet's curiously Teniers-like studies of peasant life; Teniers-like in humour and subject, not in *facture*. Other names represented on the end wall are Gravelot, the French-English artist Reynolds (no very remarkable drawings); Bartolozzi, by whom is a fine nude study in red chalk, and Angelica Kauffmann, whose crayon drawing of "Paris and Helen" is a fine composition, more vigorous in style than the general average of her works.

A large study of Fuseli's for his "Nightmare" is near there, not equal in conception to the picture however. Landscape studies by Paul Sandley and Barrett are to be noted; a lovely sketch of a sleeping child and angels by Cosway, and the caricature of Gibbon by Lady Di Beauclerk, the wife of Johnson's fashionable friend. Blake is represented by one or two of the most Blakian of his drawings. Flaxman's various drawings for the monument to Collins are grouped together, illustrating the poet's

Ode to the Passions. John Ward is very largely represented, and his collection of water-colour studies of animals affords remarkable evidence of his power. Turner and Girtin are represented by two drawings only, side by side, both of architectural subjects; Turner's being Magdalen tower and bridge, and Girtin's a beautiful sketch of a delightful old Georgian House, "Dr. Monro's House, Fetcham." Sir Thomas Lawrence surprises us, besides the sketches for portraits (a very characteristic one of William Godwin), by a "View of the Meadows Opposite Sloane-street by Moonlight;" a curious experiment for the time, and for a portrait painter; it is a slightly worked sketch on dark grey paper, but the effect of moonlight is very well conveyed.

The collection seems to draw a large number of visitors of the average class. Possibly at at some other time the authorities would give us a collected exhibition of the architectural and decorative drawings in their possession; it would not be so popular with the many as this miscellaneous selection, but it would attract great interest in the artistic world.

SOME PRINCIPLES AND METHODS OF DESIGN.*

As the engagement I made some months ago to read a paper to the Architectural Association,—and had, I fear, forgotten,—was brought to my memory somewhat late, and at a very busy time, when any considerable amount of preparation was out of the question, I decided to take up a subject which has necessarily forced itself upon me in the course of practice, of which the materials are therefore ready in my mind and had only to be arranged with some degree of method and order. I am, of course, compelled by the nature of the subject to speak from personal experience, and, lest my remarks appear egotistical, I must premise that I have no wish whatever to claim for my own methods any superiority over those of others, which may be equally good or better. A comparison of experiences in methods of design can scarcely fail to be profitable, and I propose, in giving my own for what they are worth, to aim at raising discussion rather than to dogmatise.

But seeing that method in design must necessarily be governed by the aims and principles of the designer, I have thought it best to widen my subject somewhat, and to define what in my opinion these should be.

In stating the principles which should govern design, and must therefore dictate the method, I am aware that I shall have nothing original to say. It has been said to my knowledge already in this Association by one fully competent to deal with the question,—and has, moreover, been lately more fully discussed in connexion with the question, Is Architecture an Art or a Profession? As to the latter question, I may observe incidentally that I would that architecture could be altogether an art, and not at all a profession; but, unfortunately, such is the condition of things, however much we may strive to limit our thoughts and aims to the artistic view of practice, the professional is found to obtrude itself to a quite lamentable extent.

Still, I assume that with all whom I am addressing, art is the motive and aim of their design, and the professional side of work is considered as a necessary and more or less unpalatable condition; and, further, that it is their determination that the work which passes under their own names shall be absolutely and entirely their own. If this were otherwise my task would be greatly simplified. I should merely have to say: "Choose an efficient clerk, interfere as little as possible with his design, spend a good deal of time in looking after the execution of his work, and bully the builder so that your clients may put you down as a thoroughly practical man and give you credit for its origination, and do not grudge the time necessary to make yourself tolerably acquainted with your assistant's design, lest you should at any time be at a loss to answer any embarrassing questions which a troublesome client may ask." By this means a life of comparative leisure, varied with pleasant trips at other people's expense, may be combined with reputation and affluence.

Let us assume, however, that we all are agreed that the system which may be described as that of the "devil," "the ghost," "the sweater," whichever term be preferred, be regarded as the fraud on the public which it undoubtedly is, and that further, we look upon every work undertaken as an opportunity for working out a result for the benefit of art,—that this is definitely held to be the motive and the crown of the architect's work.

But however ideal the motive may be,—however exclusively it be held,—it is impossible to ignore the fact that the art of architecture is, more than any other art, based upon the practical. It is of all the arts that which, to use a metaphor, must be most deeply rooted in the earth. The extent to which the ideal is conditioned or governed by the actual varies in all the different branches of art. The degree to which the proportion varies in regard to each might be a matter for somewhat lengthy discussion; but it is clear enough that if the arts were placed in order, however it might fare with the intermediate branches, poetry, sculpture, and painting, architecture and music must necessarily occupy the extreme positions,—the one as being most closely held in the bonds of the actual and practical, the other as enjoying the greatest amount of freedom. Whether this is a favourable condition or the reverse is also a question which could not be easily settled. I am not prepared to admit that, because of its bondage to the practical, Architecture need consent to take a back seat among the arts. This condition undoubtedly makes the attainment of the desired result a more complex and, to a great extent, a more difficult operation. It certainly should, if duly understood by the public, make our critics more appreciative of success and tolerant of comparative failure than they seem inclined to be at present. At any rate, however our art may stand affected favourably or the reverse by the conditions to which it is subject, it is obvious that success can be looked for only as the result of a frank and candid recognition of its limitations, and this recognition must necessarily influence the methods employed.

The problem, then, as it presents itself to the architect, is to deal with all the practical elements of architecture; to fulfil precisely the requirements of his client as to accommodation, arrangement, to give full weight to conditions of health, &c.; to construct his building in a thoroughly architectural manner, without any undue resort to such facilities as engineering may afford in these later days; and to accomplish all this within certain specified limits of expense. When he has accomplished all this, if he has done no more, he has, according to my theory, in no manner approached the proper or legitimate functions of an architect. We may allow that his achievements may be considerable; that if the work on which he is engaged is large and complex, he has shown, even in doing so much as this, faculty of no mean order, such as might have won him much credit in many departments of intellectual labour; but we must also maintain that he has not even begun to show himself an architect in the proper sense of the word. He has but built the scaffold, which is an essential means to the end. He only can claim to be considered an architect who has turned all these preliminaries to an artistic result. Nor, again, is it possible to deal with these several phases of the work of the architect as though they could be at any point detached or separated. So far, my metaphor of the scaffold is somewhat inaccurate. A scaffold is first erected in order that the building may be subsequently reared. In architecture the artistic aim must be an integral part of the primary conception of the design. It is sometimes held that the first step towards a design is to obtain a good practical plan, and to work from that towards an architectural result. Indeed, I have seen in print proposals that in competitions a plan should be arrived at by a preliminary process, and that in a second competition architects should be invited to show how they can turn such a practical plan into a work of art. The proposal of such a system appears to me to show an absolute ignorance of the genuine conditions of architectural design. It implies, in the first place, that the sole field of artistic design is limited to the elevation; whereas it should be obvious that no one of the three integers,—plan, section, and elevation, should be considered apart from the others. They are essentially the several aspects of what should be one coherent conception—simultaneously realised. It is probably the vulgar spirit of advertisement, which is the bugbear of the age and the enemy of art, that has led to such a misconception. It is because very many more see the exterior than the interior of a building that architects themselves are prone to dwell upon the elevation, and, so far as artistic aim is concerned, to let the plan and section shift for themselves. In a very large number of buildings, and those generally of the greatest importance, if one were bound to give a preference to any portion of the design, —which, as I have said, should be held to be essentially indivisible,—I should prefer myself to give it to the plan and section, first, because those who pay for and use the building have the first claim to consideration; secondly, because in some of the principal types of the great architecture of past ages interior effect is unquestionably the originating motive, to which the exterior effect is altogether subsidiary. Gothic architecture is hardly properly understood except by those who realise that it is the style of stone vaults. The result of these vaults, through a constructional necessity, is the presence of a complication of flying buttresses, which to me, so far as it is possible to detach oneself from the influence of a thousand delightful associations, are in themselves inimical to the dignity and repose of the exterior. If this seems a hard saying, I would point out that I have at least the authority of two of our greatest English architects. William of Wykeham, by one of the most powerful and revolutionary innovations of which we have any record, dispensed with flying buttresses in vaulting the nave of Winchester Cathedral; and Sir Christopher Wren, as we all know, in building St. Paul's from the Mediæval plan which was forced on him, buried his clearstory, so as to obtain lofty and unbroken side walls. If the latter instance be discounted on account of Sir Christopher Wren's well-known preference for Classical form, I would observe that in other cases, notably in some of his towers, he showed more real mastery of the essentials of Gothic design than many who have become famous by an exclusive following of Mediæval style, and that, whatever his leanings may have been, he is at least no mean authority as to the elementary conditions of architectural effect.

And there is still one thing further to be said in this connexion. The interest of the exterior design is to a large extent conditional upon the extent which it expresses the interior. It bears to the interior something of the same relation that the body bears to the spirit, which it partly expresses and partly conceals. An exterior is never so attractive as when it reveals to the beholder much of the purpose and construction of the interior, while it arouses curiosity as to many minor points indicated rather than made clear. It is because in the type of Classical architecture which made the interior take its chance and placed it at the mercy of such a formal exterior as was considered of paramount importance that we have become so intolerant of this school in spite of the attractions of symmetry, proportion, and dignity, which were never more excellently displayed.

But to return from what has been a somewhat lengthy digression, we shall, I hope, all be agreed, first, that the artistic aim which should be the motive and inspiration of architectural design, and which alone raises the architect above the mere builder, should be inherent in the very earliest conception of the work; and, secondly, that there should be no severance in order between the three aspects of a design,—the plan, section, and elevation; that art must rule each in an equal degree and all together, and that if any preference is to be given, it should *not* be bestowed on the elevation; that the merit of a design will depend inevitably upon the degree in which all the elements of effect have been simultaneously conceived as parts of an indivisible and coherent whole.

We may now consider what methods of design may best tend to such a result. Of course the difficulty of attaining this will be in exact inverse ratio to the scope and compass of the individual architect's imagination, which, though a gift of nature and not therefore at his entire disposal, may nevertheless be nursed and developed in the course of practice, as well as immediately helped by the adoption of methods well adapted to the conditions of design. The first point, then, will be never to let any portion of a design be considered fixed until the whole has been realised. In dealing with a large and complex scheme, especially where the practical requirements are of im-

* A paper by Mr. Basil Champneys, M.A., read before the Architectural Association on the 6th inst., as elsewhere mentioned.

portance and intricacy, there is an undoubted temptation to make a plan and adopt it as a fixed condition of the design. The plan should, however, in its first conception be tested as to its capabilities both of interior and exterior artistic effect. The grouping which it involves should be checked by elevations, however rough, and no one feature should be considered as fixed until the whole effect has been satisfactorily understood. The aim should be to get the entire scheme, drawn no matter how roughly, into a thoroughly malleable state, so that it may be handled as freely as a sculptor handles a mass of clay. No one feature or arrangement should be considered settled until it has been made to lend itself to a coherent result. If there is one word of advice more important than all others, I should word it thus, "Beware of fixed ideas." No doubt the operations involved are not easy. It is no small difficulty to make even the various plans of a building properly and constructively coherent. There is a great temptation when difficulties occur to resort to the mechanical contrivances which have, to those who consent to abuse them, made planning a comparatively easy matter. To my mind the absence of what I have called constructive coherence is entirely destructive of any true pleasure in a design. I can recall works of, at first sight, considerable merit in which I could take no permanent pleasure because of the absence of this quality. You sometimes go over a house floor by floor; the ground-floor is admirably planned, so are the upper floors; but a little closer study shows you that the upper in no way follows from the lower. You suspect concealed stanchions and girders, which on inquiry, are found to be present, and your pleasure in this building as an architectural achievement ceases,—a similar disappointment is felt when an exterior which has delighted you shows, on examining the interior, to have been forced, and to bear no direct relation to it.

To avoid such miscarriages as this, it is essential to make all your plans at one and the same time. This may be done by two methods. You may either make your upper plans on tracing paper set on the plan beneath, or, what is in some respects a better method, use pencils of different colours on the same sketch. There are disadvantges in both, and their comparative merits may be left to be settled by experience. Either method will enable you to plan all the floors simultaneously, and to give to the arrangement that constructive coherence which is the essence of good planning. You will not fail to see what are the weak points below. You can by modification of each and all make sure of sound substructure, and can, if necessary, as is often the case with large buildings, ascertain what weight per foot you have to put upon your masonry, and can thus arrive a a very early stage of the design at the necessary thickness of walls and piers, which often influences a plan more than one would anticipate.

But even while yon are seeing your way to the whole artistic result to which the practical has already had plenty to say, there is still another kind of consideration even more severely practical, and often harder to deal with than the former, which is that of estimates. It is a fatal thing to get launched upon a scheme which is in excess of the sum you are allowed to spend. The object should be, at the earliest possible stage of the design, to see how you stand in this respect. I have said that this operation is severely practical, and in a sense it is so; but in another sense it is an inevitable condition of an artistic result, as by such checks your whole position towards the development of your designs will be defined for you. One result, and one alone, is fatal to artistic effect, and this is to be compelled at the last moment to make a large reduction in your estimates, by cutting your building about after the design has been completed. A preliminary check will show you, either that you are attempting too large a scheme, in which case you will reduce it while it is in a malleable state; or, if this be imposeible, you can decide to make severity your aim rather than richness, and the entire expressional character of your building will be defined for you at the outset.

This is a matter in which method is of the utmost importance, and will simplify what without it would be almost insuperable difficulties. I made it a practice for many years to have every building I put up cubed, found how much each cost per foot, and kept the result in a memorandum-book. It was comparatively easy to get very near the result from the roughest drawings of a new scheme, and you knew exactly to what sort of standard of cost you might develope with safety. The process can be still further simplified if your building is of uniform height, or sufficiently so to enable you to strike a fair average. You can then represent the price per cubic foot in terms of the area, and the check becomes more simple. Do not forget, however, to allow a margin, as the excrescences always mount up to more than you anticipate; and begin checking as soon as ever your drawings admit of it, and before you have allowed any "fixed idea" to take hold of you. This will save your time and temper.

We will suppose, however, that these preliminaries have been accomplished, and that you have on paper rough drawings of your scheme, all the general effects realised, the proportions, exterior and interior, settled, and the construction worked out, to a small scale. The usual course in this case is to have the drawings completed, and handed to the surveyor for quantities, and no doubt sometimes this is inevitable; when it can be avoided, it is best, in my opinion, to take another line altogether; but this involves a further consideration of principle.

If, as we said, no severance can be made between plan and elevation, scarcely more can be shown to exist between general design and detail. The development of the individual features may often involve serious changes in the general arrangement. It must be a matter of constant experiment to those who work on the usual lines to find how gladly they would have felt, when working out the detail, that they had been left unhampered by the general drawings. The possibilities of a building are only realised by degrees. While working on a larger scale, the architect inevitably sees chances of effect for the first time; and if his general drawings are fixed, he may often have to forego results which he would gladly have realised. My own almost invariable custom is to work out all details to ½-in. scale before the ¼th. scale working drawings are put in hand to complete. It may be said that this will take more time than can be allowed, and this is sometimes the case. But I find by experience that the difficulty can generally be got over. Probably, before you begin to take up the detail you can settle your plans sufficiently to get a contract for the foundations; and while these are in hand you ought to have time to get your ½-in. scale drawings at least sketched. Then the ¼-th. scale drawings can be finally fixed. They will be fifty times more accurate than they could otherwise have been. All sorts of questions during the execution of the work, which would otherwise have been inevitable, will be saved, your correspondence will be diminished more than half, and what is not of least importance, the surveyor will know exactly what to "take" instead of having to seek safety in an ample margin; and your estimates will be proportionally reduced. As an example, I lately commenced a building of considerable size and great complexity, and my client was eager to begin. I asked for four months to enable me to start; then I had a contract for the removal of a mass of soil, which took three more months. A further contract for laying the concrete, in that most delightful of forms, one slab over the entire site, gave me another three months, and this gave me time enough to develop the design in all essentials, and what is of the greatest importance, to put it entirely aside for a month or two at a time, so as to go back to it with fresh eyes and overhaul it almost as if it had been somebody else's. If even this had not given me time enough, I was prepared to give a third contract for the basement, and gain another six months thereby for further rumination. In fact, in this case, I could without any delay have had over a year to finally mature the design, and I think it will be found by experience that the method I have described will generally give time enough in proportion to the size of the building.

It is impossible to insist too much on the necessity of time for design—especially for detail. Though I believe that it is usually better that the general idea should be realised rapidly, as it will then be more likely to have unity and coherence, it is most important not only to have ample time to work out the detail, but it is no less important to be able to get entirely outside your own ideas. We have to be our own critics—such of us at least as are not blessed with an *alter ego* as friend or partner, and we cannot criticise our own work while we are possessed by it. Therefore time is of the essence of design.

You may ask, perhaps, how the intervals are to be filled up? Well, a change of work from large to small, from secular to ecclesiastical, or *vice versâ*, will often give what is equivalent to relaxation; but even if such change does not come to hand, you may write a paper for the Architectural Association; and there is always the pleasing alternative of taking a holiday, which you may often indulge in with a full certainty that you are doing better both for yourself and your design than by trying to force it, and thereby getting stale. It does not do to have the same scheme constantly before you.

Or, again, if at the inception a design does not come readily, after you have done enough thoroughly to realise the conditions of success, put it aside and do not think about it. After an interval, during which your mind has never consciously touched it, you will often find that the task, which was stubborn and hard, has become easy. I am not psychologist enough to explain the process. It is due, I suppose, to what Mr. Herbert Spencer calls unconscious cerebration; but of the fact I am as convinced as it is possible to be of anything so intangible as a mental process.

One point which may occur to you to ask is how far assistants can help you in the processes I have described. This, I think, must be a matter for individual experience. I know that some few architects find that they can keep their minds more active if their hands are free, and if so they may very legitimately use help throughout, so long as the origination is entirely their own. For my own part, I find that it is best to draw oneself to all scales, and even personally to draw all the details full size. It may take longer, but it certainly leaves one a freer hand to alter and improve. Doubtless it limits the amount of work which can be undertaken; but I am more and more convinced that "quality not quantity" should be a primary maxim of the architect, and indeed of all artists.

In drawing full-sized detail, coloured pencils will be of immense assistance. In, for example, complex plans of columns, you have the arch load, abacus, bell, necking, shaft, base, sub-base, and plinth, all bearing a distinct relation to each other, and all possibly taking somewhat different lines. It makes a drawing easy to work from if each of these is distinguished by a different colour. I have sometimes got as far as five coloured chalks; but this is necessarily only exceptionally. These pencils are useful, too, as I said above, for drawing plan over plan; and also other colours may be used for any iron construction needed, and I find it convenient to sketch on the plan in a distinct colour the conformation of roofs when they are at all complex, showing ridges, valleys, &c. Getting all you can on to the drawing makes it easier to realise a comprehensive result. It is more easily pulled about, and it is more easily read by a clerk of works.

As I think I may claim so far to have rigidly stuck to my brief, I may, perhaps, be allowed, in the presence of an audience mostly composed of my juniors, to say a few irrelevant words. We have got so far a few maxims:—Make art your aim from the first; Keep clear of fixed ideas; Take your time; and Quality before quantity. I want to add one more which has nothing whatever to do with my subject, and to beg you not to be too clever. It seems to me that there is no one thing which in the present day needs saying so earnestly and repeating so constantly, and this not alone in the domain of architecture. It is equally needed in literature and in music, to say nothing of the other arts. How constantly one's pleasure in much even of the best of contemporary literature is spoilt by the sense of excessive and self-conscious cleverness! How each phrase is coaxed into a form which is intended to arrest and surprise the reader, whereas the perfection of style is that every sentence should appear to be the most simple and direct expression of the thought. With what relief and pleasure, for instance, we turn from reading that most able yet most irritating of authors, George Meredith, to the straightforward, easy, and manly style of Swift or Fielding. I find precisely the same note of superfluous and detrimental cleverness in much contemporary architecture, and the same relief in turning from it to the great, sober work of older and less self-conscious ages. Depend upon it, whatever degree of ability or originality a designer may

have cannot fail to show itself in his work,—that there will be no need to strive or strain; that, if he simply aims at realising his conception by the most direct process, his work will stand best in the end. Those who understand the art, and whose opinion alone is worth considering, will, if they find that he knows enough for the immediate purpose of a particular work, give him full credit for ampler knowledge.

It will not only be lost labour, but the ruin of his work, if he try to make any single design express more resource than is needed for its accomplishment. The laws of art no less than of morals are divided into the positive and the negative. "Thou shalt not" is at least as important in the artistic tables as "Thou shalt." Given a fair share of imagination, the designer will necessarily find that the task of rejection is no less considerable, and possibly more important, than that of acceptance; while the sense of ease, of simplicity, of directness,—the note of the Classical, in fact, in its widest and best sense,—will have a chance of being realised if work be handled in this spirit. Let it be remembered that any one design, however large and complex, must have for its basis one idea,—what the French call the "*idée mère*,"—and that all else must be subservient to this, or it is irrelevant and obstructive. If only the wish to be clever, the craving to be original, neither of which can be accomplished by taking thought any more than you can add half a yard to your stature, a desire most unwholesomely nursed by some of our critics, could be abolished, the prospects of architecture in England would, I believe, be very excellent. As Kingsley said to the little girl, "Be good, sweet maid, and let who will be clever." Cleverness and originality will take care of themselves if only goodness be made the exclusive aim of which the designer allows himself to be conscious.

[Some notes of the discussion which followed will be found in another column.]

LECTURES BY DR. A. S. MURRAY ON GREEK SCULPTURE:

I. THE NEREID MONUMENT.

DR. A. S. MURRAY, Keeper of the Greek and Roman Antiquities in the British Museum, has recently delivered three lectures to the students of the Royal Academy on Greek Sculpture. The lectures followed Professor Aitchison's six lectures on Byzantine Architecture, which we have printed in the last six numbers of the *Builder*.

Dr. Murray's first lecture, delivered on Monday, the 16th ult., began by a reference to the building which we conveniently called the Nereid monument, which stood on a height about a mile from the ancient city of Xanthos, in Lycia. It stood on a cliff separated by a ravine from the acropolis or citadel of Xanthos, and overlooked the river Xanthos. The district was particularly beautiful, as we knew from the sketches of Müller, and the position of the monument must have added to the charms of nature. But one day, under the shock of an earthquake, the Nereid monument tottered on its base and fell in ruins, burying beneath them part of an early Christian village which had sprung up, apparently about the fourth or fifth century. From that time the spot seemed to have been abandoned to a waste of brush and shrub till the year 1838, when Sir Charles Fellows, in his zeal for exploring, visited the site. Convinced that much of the sculpture was still to be found under the ruins, he prevailed on our Government to furnish him with the means of excavating and removing to London such examples of the sculpture and architecture as he might find. That he was able to do in 1842-3. On their arrival in London these sculptures excited great interest. Gibson came from Rome and wrote an appreciative article on them. Then arose the questions how to reconstruct the ancient building, where to place the sculptures, and how to dispose the architectural members. With abundance of skilled assistance from the architects and artists of the day, Sir Charles Fellows was able to construct a model which had stood the test of criticism very well. Lately the lecturer had had occasion to look into these matters, and was glad to bear testimony to the skill and patience of Sir Charles Fellows. A room in the British Museum having become available for a new arrangement, the best thing the lecturer could think of was to place in it the Nereid monument. The new room happened to be just the size that was required, and the work was now complete. The Nereid monument belonged to a class of buildings which looked like temples, and yet could not have been used as such, for the good reason that they were erected on high basements or pedestals, which prevented access to the buildings themselves. It was a class of building which seemed to have enjoyed great favour in that southern part of Asia Minor. An example still stood at Mylassa, in Caria, but the finest and greatest of them all was the Mausoleum at Halicarnassus. Since the Mausoleum was in the first instance the tomb of Mausolus, and in the second a monument to his memory, it might be concluded that the other structures of the kind in that district had also served at once as tombs and as monuments. Their resemblance to temples was not accidental: it was intentional. In Greece proper it was a recognised principle that a tomb should in some measure have the aspect of a temple. But the principle was not carried so far as in Lycia, where innumerable tombs were to be seen cut into the solid rock, and having each the appearance of a small shrine. On the plains stood numbers of lofty tombs. The Lycians might be considered as consisting chiefly of a native race, with leanings partly to Persia in the east and partly to Greece in the west. There were also in Lycia a number of Greek settlers who presumably fostered and encouraged the Greek inclinations of the rest. Against these influences was the enormous force of the Persian empire, exercising the right of a superior over Lycia, requiring tribute, and enforcing as much submission as could be got. Occasionally the Lycians rebelled and fought hard for their independence. Occasionally, single towns like Xanthos broke into revolt, and were assailed by the Persians with assistance from other Lycian towns. Circumstances like these had to be borne in mind when endeavouring to understand the sculptures of the Nereid monument, which need not necessarily have been the tomb and monument of one man, as was the Mausoleum; most likely it was a monument to men who had fallen in some victorious war by land and sea. The sculptures pointed clearly in that direction, and so far Sir Charles Fellows was right in the name he originally gave to it, "the Ionic Trophy Monument." In adopting the now current name it was not of course implied that the building was the tomb and monument of the Nereids, for the Nereids were beings who needed no tomb: they never lived nor ever died. The present name was merely a stop-gap, meant to characterise the building by naming it after those female statues in the intercolumniations which were, in fact, its principal feature. So long as those statues were believed to represent Nereids, so long would the name of "Nereid monument" have as good a claim as most names had. Turning to an examination of the sculptured friezes on the base of the monument,* the lecturer said they obviously represented some historical incident such as the capture of Xanthos, or some other city, by the Satrap Harpagos. Describing in detail the various groups, he said that the influence of the Parthenon frieze was apparent, and there were also motives which reminded us of the Phigaleian frieze. It might be mere accident that the height of the Nereid frieze was the same as that of the Parthenon; but it could hardly be an accident that the treatment of the relief was the same in both,—in this important particular, that every figure was studiously presented to us in the lowest possible projection. This was carried to excess in the Nereid frieze. For instance, when the leg of a horseman hangs below the belly of his horse, and was therefore some distance out from the background of the slab, there was no attempt to round off the foot and leg. On the contrary, the surface was as nearly flat as possible; the marble behind it was merely cut away enough to obtain some shadow for the contours. Looked at sideways it had a rough unfinished appearance. As to the date of the sculptor of the Nereid monument, he had evidently lived in the thick of the combined influences of the older idealism of Pheidias (as seen on the Parthenon) and of a new movement which had for one of its chief features a display of much drapery and at the same time so employing that drapery as to reveal the forms beneath it. That movement, it might be said with next to certainty, ran its course in the period 438-400 B.C. Its seat and centre was Athens. It must have been almost a fascination for a sculptor to render a figure in rapid motion with long thin drapery clinging close round one leg and then falling in long, crisp, beautiful folds as it stretched to the other leg. Though there was naturally a tendency to excess in the rendering of these folds of drapery, the sculptor seemed to have been aware of that tendency, and to have counteracted it by a corresponding display of nude or smooth forms, such as the shields of the fighting men. In the matter of architecture, it had been pointed out by others that the Nereid monument had certain significant features in common with the Erechtheum on the Acropolis at Athens. The date of the Erechtheum fell exactly in the period he had mentioned,—438-430 B.C.,—and it was therefore not very hazardous to suppose that the Nereid sculptor had been well acquainted with this and the other buildings which had just been or were still being erected in Athens. The statues of the Nereids were an organic part of the monument,—the most noticeable part of it, in fact. The idea was peculiarly happy. But what could have led up to it? The only thing the lecturer could think of as an answer to that question was the porch of the Caryatids of the Erechtheum; in the latter, draped figures served as columns; in the former they served as companions of columns. The figures of the Nereids were, so to speak, one remove further away from columns than the caryatids. But they had this in common also,—that they were all sisters and all of a uniform type, which gave them a certain architectural character in common with the caryatids. Gibson preferred to regard these statues as personifications of coast towns of Lycia and the neighbourhood, allied together for a common purpose; but by general consent they were Nereids. Many other interesting points as to the Nereid monument were discussed by the lecturer, who concluded by expressing a hope that in its new place in the British Museum the monument might become the object of renewed attention and study.

* There are two friezes,—the one broad and low down on the base, the other narrow and placed along the top of the base

II. THE TEMPLE OF NIKÉ APTEROS, ATHENS.

Dr. MURRAY'S second lecture, delivered on Thursday, the 19th ult., was devoted to a consideration of the Temple of Nikè Apteros (Wingless Victory) at Athens. The name of the temple, said the lecturer, was undoubtedly ancient, and was used by the Greek traveller Pausanias; and yet it seemed singularly inappropriate when almost the first features of the temple to impress us were its sculptured figures of Victory, which were anything but wingless; they were, indeed, conspicuous by their wings. But the temple had also another name, that of Athena Nikè, which would mean a manifestation of the goddess Athene in the character of Nikè or Victory. It was, in short, a temple of Victory, by whatever other epithets it was specified from time to time. Having described the curious position of the temple on the jutting piece of rock in front of the Propylæa,—an irregularity which was purposely retained, as the jutting piece of rock was hallowed by the legend that on it sat King Ægeus watching the distant sea for the return of the ship which he had dispatched to Crete conveying his son Theseus, with other human victims whom he was obliged to send as a tribute to Minos, the King of Crete,—the lecturer said that the Temple of Victory was seen standing in the early part of the seventeenth century, when two travellers,—one a Frenchman, the other an Englishman,—visited Athens. But they hurried past it with only a few words, being eager to get to the Parthenon. Their remarks conveyed nothing as to the state of the building, which was much to be regretted, because not very long after, the Turks, who then had possession of Athens, and who were in fear of an attack from their enemies, the Venetians, set about erecting a great bastion across the front of the Propylæa. The Temple of Victory stood in their way. They threw it down and employed its stones and sculptures in the formation of the bastion. There the stones and sculptures lay. The Temple of Nikè had passed out of sight and apparently out of mind till the beginning of the present century, when Lord Elgin's artists found four slabs of the frieze and sent them to London to the British Museum, where they still are. But again a period of indifference set in, and nothing more with regard to the Temple was done until 1835, when the old Turkish bastion was pulled to pieces and the Temple of Victory restored, as it now stands, from the

marble blocks and sculptures found built into the bastion. The restoration was not nearly complete; a good deal of structure and much of the sculpture were missing, but in a way we felt that we had the Temple before us when we ascended the Acropolis. The sculptures that had suffered most were those which formed part of what was called the balustrade of the Temple. Between the Temple itself and the abrupt edge of the platform, where the space was narrow and dangerous, it had been necessary to provide some protection for those who might care to pass round the building for the sake of the incomparable view, if for nothing else. A metal railing would probably be our notion of the best way to have prevented accidents; but the Athenians preferred a low wall of marble nearly breast-high, richly sculptured on the outside. The Temple was of the Ionic order, with four columns at each end, but none along the sides. The frieze was sculptured, but whether there were sculptures also in the pediments it was impossible to say. One of the difficulties in connexion with this Temple had been to ascertain its date and the circumstances under which it was erected. Was it at the conclusion of a successful war? One would think so, and yet we could not see what need the Athenians had for any special temple to Victory when they had already the Parthenon to serve as a perpetual monument of their success in war. But we read of their success in war subsequent to the building of the Parthenon, and we knew that the Temple of Victory must date from that subsequent period, judging by the style of the sculptures and by its architectural features. What, then, could be more simple than to conclude that the Temple of Victory had been erected as a special memorial of a subsequent war, and as a sort of auxiliary to the Parthenon? The theory sounded quite reasonable, and yet it was unsatisfactory without some farther explanation. We still wanted to know why the new Temple was placed in such close proximity to the Parthenon and on that particular site. Pausanias had left on record that he had seen at Mantinea a statue of victory the work of the Athenian sculptor Calamis, and that Calamis had, in that statue, reproduced the image of Nikè Apteros in Athens. But seeing that Calamis lived long before the building of the temple of Nikè Apteros as we knew it, there must have been an older Temple of Victory at Athens which contained the image in question. What was more likely than that the older Temple has stood on the same rock as the present temple? It could only have been a small shrine, possibly smaller than the present little temple. But when the Persians took and destroyed the Acropolis of Athens that shrine would be the first to fall; and when, after the Persian devastations, the Athenians set about restoring their Acropolis in greater splendour than ever, they would include in their plan a new shrine for the old goddess of Victory. The restoration of the Parthenon was their first care, then followed the Erechtheum, the new Temple of Victory, and the Propylæa. Although there might be some surmises in that theory, it was not entirely built up on surmises. The lecturer expressed his inability to agree with Professor Benndorf, who took the present temple to be, in fact, the old one which contained the image of Nikè copied by Calamis. But the sculpture and architecture were manifestly later than the Parthenon. It was another question whether the masonry which now appeared to form a high basement for the temple, but which in in reality forms a casing round the rock on which the temple stands, was part of the original plan, or whether it was not constructed some years later to connect the Temple in a manner with the new Propylæa, and to obtain as harmonious an effect as was possible in the circumstances. The lecturer believed that that was the general opinion now; and, in fact, it was clear that the apparent basement had no organic connexion with the temple above it. Those parts of the balustrade which had survived represented chiefly the goddess of Victory. Some fragments clearly belonged to Athene herself, and could easily be restored as such, but the most completely preserved figures were those of Victories erecting trophies, leading cows to sacrifice, or stooping in haste to fasten a sandal. Had they been exceptional figures in the composition, it must have been a curious fate that had preserved them, and them alone; it was more likely that these figures of Victory which had survived were types or representatives of those which had perished. The difficulty was to imagine what could have been the effect of long lines of Victories, always winged and always presenting the same type which we found in the slabs that existed. Having noticed Professor Kekulè's suggested "restoration" of the balustrade, with which he disagreed, the lecturer said that as the Victories were all of one kindred and had a common purpose, but no combined action, he should propose to break up the composition into groups by means of pilasters, and leave each group to speak for itself, like a series of metopes. The balustrade would thus present something of the character of a metal or wooden barrier with upright posts at regular intervals; and, in fact, the tops of the slabs showed that there had been metal-work above the marble. But he confessed that while his proposal would dispose of many difficulties which had hitherto proved insuperable, we had at present no direct evidence in its favour, nor any certain analogy in Greek art which could be cited in support of it. They had, however, in the Museum a set of marble slabs, with reliefs sculptured within sunk panels. Those reliefs came from the Mausoleum, but where they originally were placed on that building had never been ascertained. The frieze of the Temple itself was, it would seem, by a different sculptor, and had been fairly well preserved. The Museum possessed one slab from the north side, one from the south side, and two from the west end,—the two latter forming nearly the entire length of the west frieze. The composition was clear enough on the whole, though the exact meaning on some points might be obscure. The style of the sculpture was at once recognisable as pure Athenian, of the age that followed immediately after Pheidias and the building of the Parthenon. Three of the sides were occupied with battle scenes, in which Greeks were opposed to Persians or Asiatic Greeks, wearing the long thin chiton, as on the Nereid monument. The fourth side, which occupied the front of the temple, presented us with an assembly of figures more or less in repose. We knew that these figures represented deities, but we could not tell what was the occasion for that meeting of deities. In conclusion, Mr. Murray discussed the figures and groups of these friezes, pointing out resemblances to and divergences from the Parthenon frieze.

III. Representations of Victory.

Dr. Murray's third and concluding lecture of the present series was delivered on Monday, the 23rd ult., on the subject of "Representations of Victory." He said that the representations of victory which had survived in Greek sculpture referred mostly to war, by land or by sea. Their variety was manifold. We saw Victory erecting a trophy, slaying an ox in sacrifice after a battle, standing on the prow of a ship, holding in her hand a model of a ship's prow, or in other ways clearly indicating the successful issue of a war. But the Greeks also recognised that "Peace hath her triumphs no less renowned than war," and he would begin with an illustration of that fact. At first sight there was not much difference between contest on the field of battle and the contest of Heracles with the Nemean lion. Still, there was a difference, because in the contests of Heracles with monsters such as lions, wild boars, and hydras, it was not so much the actual encounter that was thought of as the underlying sense of the great service he had rendered in ridding the country of such pests. His actions belonged to the triumphs of peace. Heracles had slain the Nemean lion and stood resting after the encounter, eager for the drink of cool water which the nymphs of the wells at Nemea brought and held out to him. When he had been refreshed he would strip the lion of his skin and would thereafter wear that skin as his regular attribute or cognisance. Meantime, while he was reaching forward for the water, a Victory appeared in the air above, holding out a wreath. In illustration of this point, the lecturer referred to a diagram which had been enlarged from a Greek gem lately acquired by the British Museum. The date of the gem would fall a little before 400 B.C. The manner in which the subject was treated in that gem had some special points of interest. The instances in which the contest of Heracles with the Nemean lion was represented in Greek art were very numerous; but, besides the gem referred to, the lecturer said he knew of only one other instance in which Heracles stood resting with his foot on the dead lion. That other instance was found in one of the metopes of the Temple of Zeus at Olympia. The metope in question had been much broken and injured. Part of it was in Paris, in the Louvre; parts in Olympia; and parts missing. The missing parts were just those where the vase held out by the nymph, and the Victory in the air above, as seen on the gem, would come in; and it would be very curious if the gem should lead to a correct restoration of so important a piece of ancient sculpture as the metope of Olympia. The group on the gem looked very much as if it had been originally conceived for a square metope. Not that the lecturer wished to suggest that the gem had been directly copied from the metope. Greek craftsmen had too much skill, and were too fertile in imagination, to make direct copies. On the gem, Heracles held out both his hands; on the metope he rested his head on one hand with his elbow on the upraised knee. But that variation did not exclude a more or less exact coincidence in the other parts of the composition, It was possible that in the Olympian metope there might have been no "Victory" in the air above flying with a wreath; but the presence of the Victory on the gem was interesting, because it reminded us of another kind of triumph which belonged more strictly to the realm of peace. In the games at Olympia, the contest which carried with it the greatest honour was the chariot race. Poets, sculptors, and painters celebrated the winners in that race, and among the prominent men thus celebrated was Hiero, a Prince of Syracuse in the early part of the fifth century B.C. His praises as sung by Pindar we still possessed; we read of the chariot group which was set up at Olympia to commemorate his victory, and we had many specimens of the silver coinage which he caused to be struck for the same purpose. Now on those coins we saw a chariot and four horses, and above the chariot a Victory flying with a wreath in her hand and very much resembling the Victory on the gem. The Victories on these coins were nearly the oldest representations of the goddess that we possessed; apparently she had not come into art in early times. The idea of Victory had of course been long familiar, but it had not taken artistic shape till art had advanced to such a degree of skill that it could conceive and represent her under a type which remained constant for all time. That was not at all surprising. The same was the case with Eros, the god of love. There also the idea had been familiar from the beginning of time, but it did not take a place in Greek art till a comparatively late period. Artistic ideas had what naturalists call a "life-history," and in some instances that life-history strikingly reminded us of the butterfly bursting into full life out of a previous stage of existence as a caterpillar. So it was, apparently, with Victory. We must look for her previous stage among the customs which had prevailed from time immemorial in commemorating success in war. The first thing the Greeks did at the close of a successful battle was to erect a trophy on the battle field. They fixed in the ground the stump of a tree, placed on the top of it a bronze helmet, lower down a cuirass and shield, and still lower down a pair of greaves, so that the whole had the aspect of one of the enemy dressed in the array in which he had fought. That was the ordinary practice. When a trophy had been erected, the spoils were gathered and brought home. The armour and weapons which had been taken from the enemy were partly exhibited in temples, and partly converted into statues of the deities who were believed to have aided in the victory. In naval warfare it was, of course, impossible to have a trophy on the spot of battle. But those parts of the enemy's ships which had been made of bronze, such as the prow with its ram, or the bronze ornament of the stern, called the *aphlaston*, were collected and converted into monuments to be placed in temples, or in parts of other public buildings, such as porticoes, which were much frequented. There was no law as to the form those monuments should take. For instance, the Æginetans, who had been proclaimed the bravest of all in the famous battle of Salamis, chose to send as their memorial to the temple at Olympia a mast surrounded by three golden stars. There was a drawing by the late Professor Cockerell, in which he sketched his notion of the monument; he took the words of Herodotus literally, and showed us a mast with three stars on the top. But the lecturer doubted whether Herodotus meant by a mast a mere upright

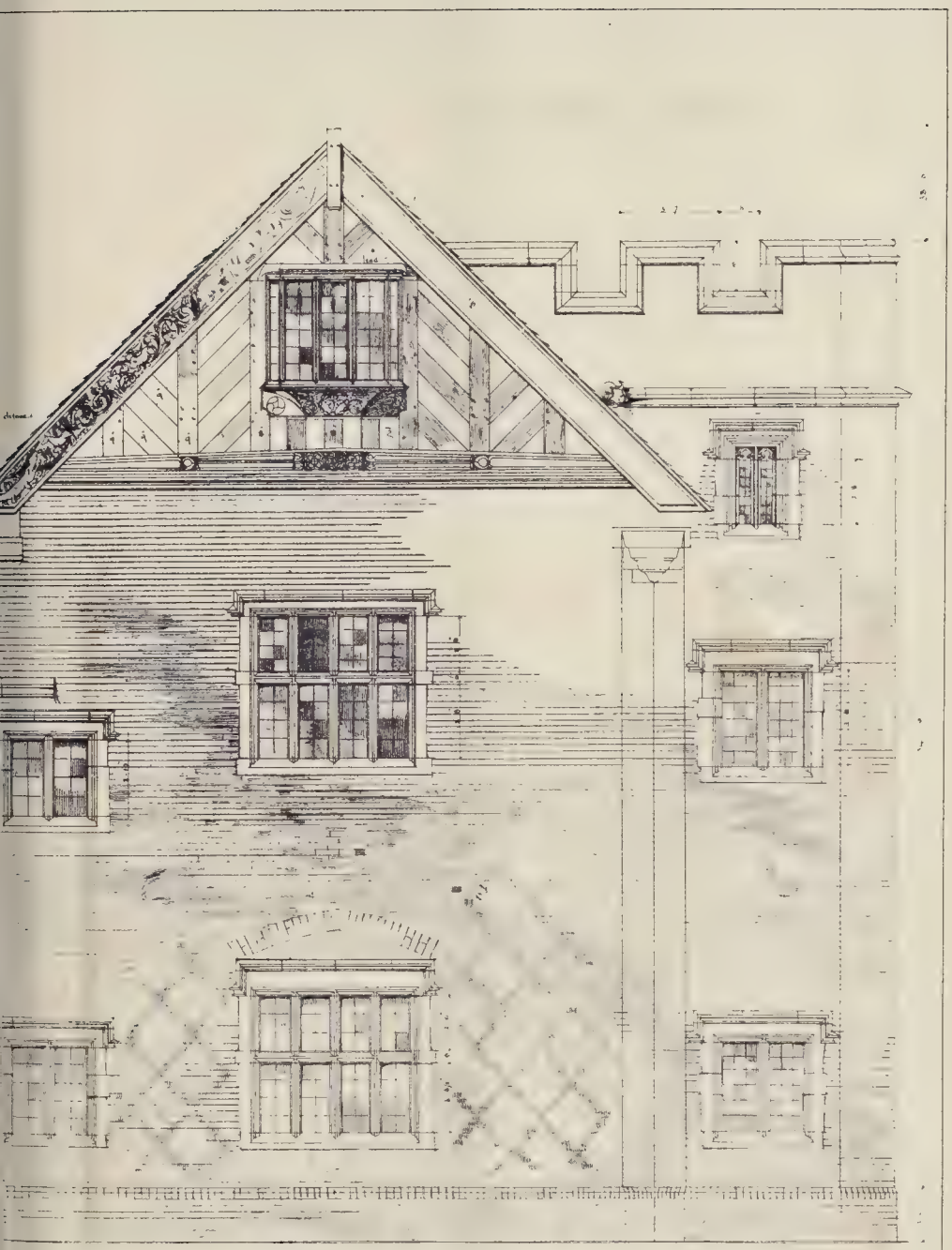
Compton Wynyate · Warwickshire ·



Bay

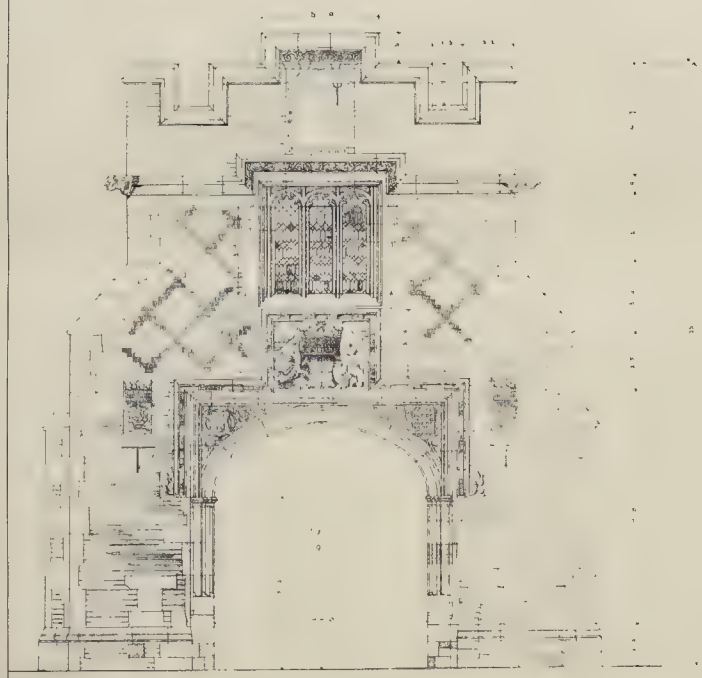
End of Great Hall

Awarded Silver Medal, R.I.B.A., 1891.

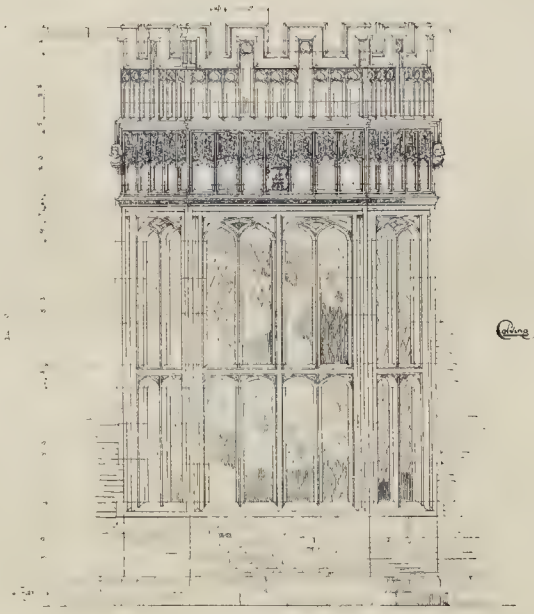


Large Gable & Tower West Elevn

Compton Wynyate Warwickshire.

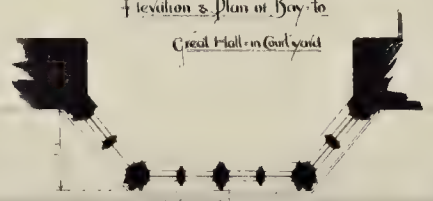


Porch — ½ Inch Scale



Scale of Feet

Elevation & Plan of Bay to Great Hall in Courtyard







Angle Mullion



Compton Wynyate Warwickshire

Belonging to the Marquess of Northampton

Built by Sir W. Compton [illegible] The materials were brought from Fulbrook Castle when that [illegible] Palisades in a new manner round the Tilting Ground from Banbury Stone. Mr. Evans is the present tenant.



West Elevation



South Elevation

Scale of Feet

Awarded Silver Medal, R.I.B.A., 1891.

Compton Wynyate : Warwickshire



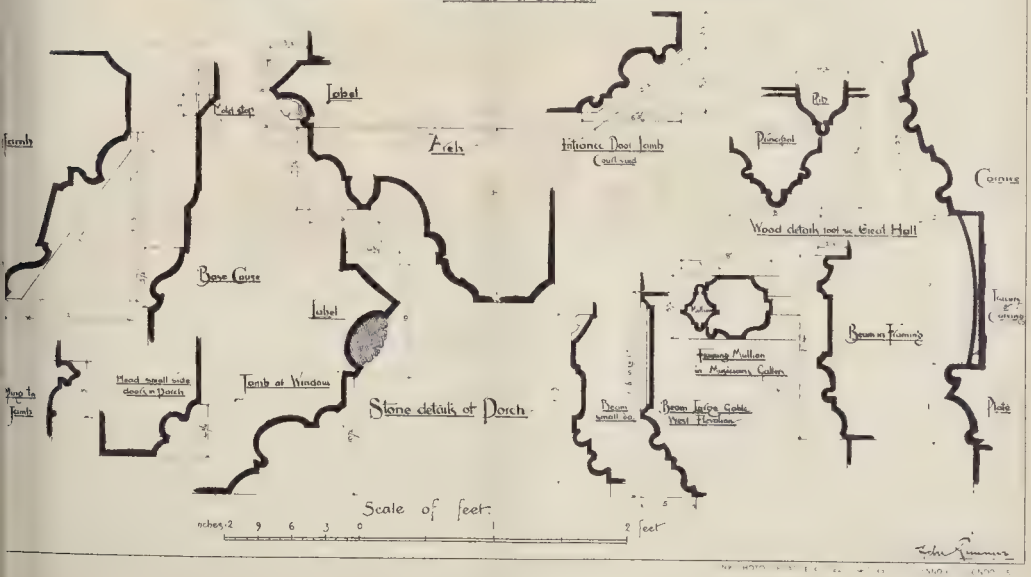
West Elev.n to Court yard

Scale of Feet



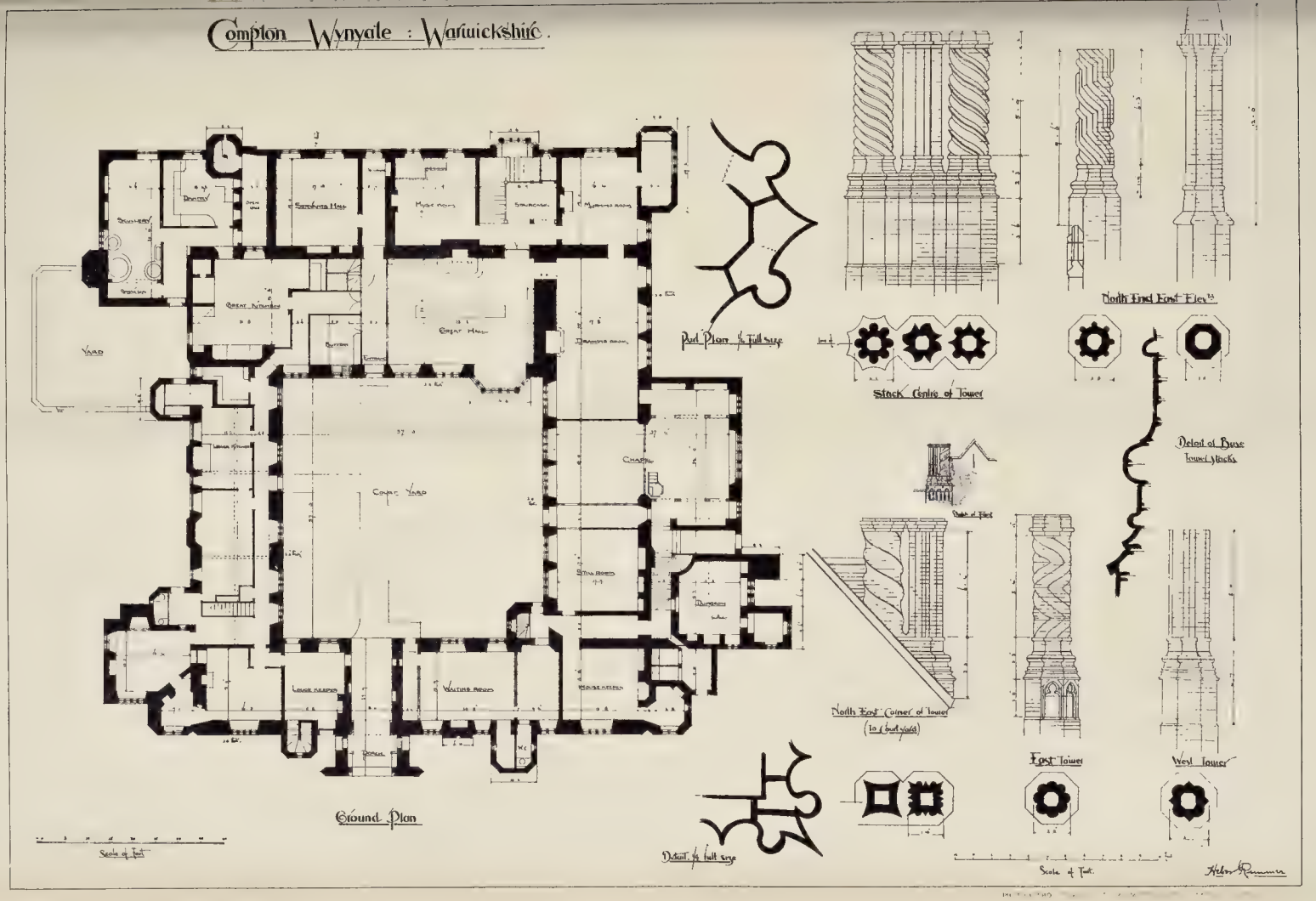
Section thro Porch &c

South Elev.n of Court yard



Awarded Silver Medal, R.I.B.A., 1891.





Awarded Silver Medal, R.I.B.A., 1891

Compton Wynyate Warwickshire



Awarded Silver Medal, R.I.B.A., 1891.



Hubert Rumsey

INK PHOTO SARAGUE & CO 22 MAIT NO

pole. A mast to him would include a yard and ome indications of rigging. It could not otherwise suggest a ship or a naval battle. Very ikely the three golden stars had been placed ne on the top of the mast and one at each ard-arm. In the matter of monuments, the and forces had the advantage over the sea orces in being able to raise a trophy on the ield of battle; but when it came to a commemorative statue, the land forces were at a lisadvantage. A statue of Apollo or Athene olding a helmet or cuirass, or a handful of words or spears, was almost an impossibility. t would not have been intelligible for one thing; hey would have been taken to be simply gods f war. But an Apollo or an Athene holding ut a model of the prow or stern ornament of war-ship, there was no probability of a nistake there. The statue would clearly be ommemorative of a naval victory. Having lescribed several representations of "Victory" n sculpture,—including the two famous statues f Pheidias at Olympia and Athens, each repreenting the same idea of a great deity holding ut in the hand a "Victory" starting or ready o start on a message of divine approval,—the ecturer concluded by describing some further nstances of the representation of Victory on ntique engraved gems.

COMPETITIONS.

THE SOUTH KENSINGTON MUSEUM.—It is announced that the authorities of the Science nd Art Department have issued instructions to ompetitors for the completion of the South Kensington Museum buildings. The competition will be limited to eight architects, viz., Mr. ston Webb, Mr. T. E. Collcutt, Sir Thomas Deane, and Mr. Macartney, nominated by the Government; Mr. J. Belcher, Mr. Bodley, Mr. V. Emerson, and Mr. T. G. Jackson, nominated y the Institute of British Architects. The esigns are to be delivered in July, and each of he competitors will receive a sum of 300 uineas. The professional adviser will be Mr. lfred Waterhouse, R.A.

MORLEY TOWN HALL.—At a meeting of the Morley Town Council on the 3rd inst., in committee, the Mayor (Alderman J. Hill) presiding, he Council considered the competitive plans or the new Town Hall, which it is proposed to rect at a cost not exceeding 15,000*l.* The wards were as follows:—Messrs. H. Holtom & A. Fox, Dewsbury, 100*l.* premium; Messrs. Morley & Woodhouse, Bradford, 50*l.* premium; Mr. W. Hanstock, Batley, 25*l.* premium. The lans of Messrs. Holtom & Fox were adopted.

SOUTH-WEST LONDON POLYTECHNIC INSTITUTE.—A meeting of the Council of the Southest London Polytechnic was held at Grosvenor louse on the 6th inst., at which a design for the uilding was selected from eight sets of drawngs sent in in competition. Mr. Rowland lumbe is the consulting architect, and the uthor of the selected design is Mr. J. M. Brydon, while Messrs. Karslake & Mortimer, nd Mr. A. J. Bolton, are placed second and hird. The building, which will be erected in helsea, is to cost a sum of 25,000*l.* To comlete the committee's scheme, which involves a otal capital of 100,000*l.*, the sum of 17,000*l.* is till required. The plans are now publicly exibited at the offices of the Institute, 47, Dukeeet, St. James's.

ROYAL ACADEMY EXHIBITION.

As in former years, we shall be glad to eliver at the Royal Academy any drawings hich may be sent to us in time to be photoraphed before sending in.

We must point out, however, that such drawngs must be accompanied by the proper labels equired by the Academy, with title of work nd artists' name, one on back of the frame and ne hung to the frame, as well as a letter adressed to the Secretary of the Royal Academy onveying the same information.

ST. ALBANS CATHEDRAL.—In the description of is cathedral last week, the words "eastern tower f the Norman church," should have been "eastern rm of the Norman church."

Illustrations.

COMPTON WYNYATES.

COMPTON WYNYATE, or Wyniates, as perhaps it is more usually called,—though there are many other accepted forms of spelling, the most common of which, perhaps, is that given in the head-line above,—derives it name from some noted vineyards that here flourished. The house belongs to the Marquis of Northampton.

Perfectly situated in a luxuriantly-wooded hollow at the foot of the Edge Hills, in Warwickshire, rich in tone and mellow colour, interesting in detail and pleasing composition, it forms one of the most fascinating subjects for the architect, artist, or archæologist now existing.

It was built by Sir W. Compton about 1520, as fixed by the county historians; a date which may be approximately arrived at by a careful examination of the beautiful front porch, where will be noted the rose and portcullis of the Tudors, the castles of Castile, and other symbols. Anterior to this date, Sir W. Compton was "Keeper" of Fulbrook Castle,—several miles north of Wynyate,—and, it is said with the sanction of the King, he pulled this place down, and built Compton, using again the major part of the materials. There is ample evidence of such a transcript having been carried out.

The many and curiously-disposed stairways bear witness of troubled times; and the small secret chapel, forming the saddle-back of the main tower, is an object of great interest in itself, and is practically riddled with doors and biding-holes. It is entirely panelled in oak, and parts are richly carved. It should not be missed in a visit to Compton.

The buildings are formed round a small court, 57 ft. square. To the left, on entering, is the chapel, without any general interest. The glass of the east window is now at Oxford, being sold after the "Great Election," when three fortunes were squandered. The dining-room is next, with drawing-room over, and the barracks over all, some 130 ft. long. (The house was garrisoned by Royalists, and King Charles himself slept here before the battle of Edge Hill, 1642.) Proceeding to the front or west side is the Great Hall, with other entertaining rooms beyond, and the main staircase, by Sir Digby Wyatt. To the right are the offices.

The materials are deep red 2½ in. bricks, with yellow limestone dressings and stone slates. The special moulded bricks of the chimney stacks are a marvel of fine and intricate workmanship.

The distance of its situation from any station has kept it little known. Kineton is the nearest, but for the passing visitor Banbury is the most convenient, and is about ten miles distant. Sketching permission is freely given on proper application, and visitors are ungrudgingly conducted over almost every corner of the house. HEBER RIMMER.

We may add to Mr. Rimmer's description that this is the set of drawings which gained its author the Institute "silver medal and ten guineas." As they were considered a very good set of drawings of the kind, and form a record of a very interesting old house, we have given them complete in one number; necessarily with considerable reduction of scale, but we thought it preferable to give them complete within the space available, rather than to break up the set.

ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of this Society was held on Wednesday afternoon last, in the Council-room of the Royal Institute of British Architects, Mr. Alfred Waterhouse, R.A., President of the Society, in the chair.

The Hon. Sec. (Mr. William H. White) read a letter from Mr. W. M. Teulon, of Leamington, enclosing a cheque for 10 guineas. A special vote of thanks was accorded to the donor.

The Hon. Sec. next read the report of the Council, as follows:—

"At the last annual meeting it was resolved that the 'Red Book' should be issued, not only to all the contributors to the Society, but to every member of the Royal Institute of British Architects: this was duly carried into effect. Although your Council regret to state that the Society did not receive many additional contributions during 1890; yet, as a result, the donations received and the new subscribers for the year 1891 have far more than repaid the cost of the larger issue. That more satisfactory results will follow from the wider publicity given to the objects of the Society may reasonably be hoped.

During the year 1889 an extraordinary increase to the capital was received,—namely, 500*l.*,—from Mr. Robert P. Page, for which due acknowledgment was made in the last report; but exclusive of that amount the donations for 1889 exceeded those of last year. The subscriptions, on the other hand, show improvement, even if but slight. In 1889 the total amount of subscriptions was 314*l.* 18*s.* In 1890, 317*l.* were received, and, consequent upon the larger issue of the 'Red Book,' several more members of the Institute have become subscribers for the year 1891. The hope expressed in the last report, that subscribers whose subscriptions for 1889 had not been received would renew them, has, your Council regret to state, not been fulfilled, and they would urge upon these gentlemen, especially those,—and they are not few,—who have aided in the work of the Society for some years, to continue their subscription to the Society, which is the only one existing for the sole benefit of those of their profession upon whom misfortune may fall.

Six meetings have been held by your Council during the past twelve months; three pensions of 20*l.* each have been paid; and 332*l.* have been granted to twenty-three persons, while the applications for relief numbered thirty-eight. The donations received during the year amount to 30*l.* 5*s.*, the following being the principal donors:—The late E. C. Ayton-Lee (bequest), Mr. Alfred Aitchison, Mr. C. R. Baker King, and Mr. W. Hilton Nash. The Leicester and Leicestershire Society again give a donation of two guineas, and the Architectural Association continue their subscription of ten guineas.

The invested capital now amounts to 7,878*l.* 9*s.* 10*d.*, which includes 452*l.* 7*s.* 6*d.*, the cost of 350*l.* Caledonian Railway 4 per Cent. Debenture Stock, purchased in 1890. The capital is thus still far below 10,000*l.*, the amount many well-wishers to the Society have desired it to attain.

The income account and balance-sheet for the year ended December 31, 1890, duly audited, are herewith submitted.

The amount distributed in grants is considerably less than last year, partly on account of fewer applications, and partly from the determination of the Council not to foster the appeals of persons who have become mere begging-letter writers. The Council thus hope to be better able to assist those to whom aid will be of permanent service, and to more effectually relieve temporary embarrassment.

Your Council regret to have to announce the decease of Mr. E. C. Ayton-Lee, who had been a contributor since the year 1872, and who evinced the continuance of his goodwill towards the Society by a bequest of 25*l.* The decease of Mr. Richard A. Hill, of St. Leonards, has also to be announced. Mr. Hill had been a subscriber since 1883.

The following members of the Council retire by rotation, namely:—Mr. G. P. Raggett, Mr. George Inskipp, Mr. R. H. Carpenter, F.S.A., Mr. E. B. Lamson, M.A., and Mr. J. Alfred Gotch. To fill these vacancies, your Council have the pleasure to nominate Mr. J. Macvicar Anderson, Mr. Henry Cowell Boyes, Mr. Fred. Chancellor, Mr. Rowland Plumbe, and Mr. Augustus W. Tanner—all of whom have consented to serve if elected.

In conclusion, your Council cannot refrain from expressing a hope that the claims of the Society will receive more consideration and support, not only from the members of the Royal Institute—the number of whom who are subscribers being but a small proportion of the whole—but also from the members of the profession generally, especially those practising in the provinces—as the Council have been enabled in past years to afford effective and much needed aid to provincial architects whose distressful needs have been brought before them."

On the motion of the Chairman, seconded by Mr. T. M. Rickman, the report and balance-sheet (presented therewith) were unanimously adopted.

On the motion of Mr. Arthur Cates, seconded by Mr. Wyatt Papworth, a vote of thanks was accorded to the retiring members of the Council, on whose behalf Mr. Inskipp replied.

On the motion of the Chairman, seconded by Mr. Raggett, Messrs. Macvicar Anderson, H. C. Boyes, F. Chancellor, Rowland Plumbe, and A. W. Tanner were elected new members of the Council.

Mr. Arthur Cates was, on the motion of Mr. Rickman, seconded by Mr. W. M. Fawcett (of Cambridge), re-elected Hon. Treasurer. In returning thanks, Mr. Cates said he wished the duties of the post were more onerous than they were: the Society ought to receive at least 1,000*l.* a year in subscriptions.

Mr. William H. White was, on the motion of Mr. Arthur Cates, seconded by Mr. Raggett, re-elected Hon. Secretary.

On the motion of the Chairman, seconded by Mr. George Scamell, a vote of thanks was accorded to the retiring auditors (Mr. John Hebb and Mr. W. Hilton Nash); and on the

motion of Mr. Inskipp, seconded by Mr. Fawcett, Mr. Geo. Judge and Mr. F. W. Hunt were elected auditors for the current year's accounts.

A vote of thanks was (on the motion of Mr. Rickman, seconded by Mr. Henry Lovegrove) given to the Institute for the use of its rooms; and a vote of thanks to the Chairman (proposed by Mr. Arthur Cates) brought the proceedings to a close.

THE LONDON COUNTY COUNCIL.

THE London County Council commenced its weekly meeting on Tuesday last at noon (three hours earlier than usual), and sat until 7.15 p.m. (with an interval of fifty minutes for luncheon). The Chairman, Sir John Lubbock, presided.

The Costermongers of Whitecross-street, and the late Metropolitan Board of Works.—The General Purposes Committee brought up the following report:—

"We are now able to report the result of the inquiry which we have made, in pursuance of the resolution of the Council of Feb. 11, 1890,* instructing us to investigate, as affecting the Solicitor's and Architect's Departments and the District Surveyor, the circumstances set forth in the report of the Housing of the Working Classes Committee with regard to the conveyance by the late Metropolitan Board of a piece of land in Whitecross-street with the object of accommodation being provided for costermongers. After a thorough and exhaustive inquiry, in which we have been materially aided by a sub-committee appointed by us to consider the subject, we have arrived at the following conclusions,—

(*a*) That in the opinion of this Committee there was not sufficient supervision exercised on the part of Mr. Tarring, the inspecting surveyor in the Architect's department, over the erection of the costermongers' buildings in Whitecross-street; that important deviations were made in the structure and in the materials used without notice being taken by Mr. Tarring; and that the Committee, after making due allowance for the fact laid before them that he was working at the time under great pressure, are notwithstanding of opinion that Mr. Tarring neglected his duty and that his conduct is censurable.

(*b*) That the Committee, whilst recognising that the Solicitor's department performed its actual duty so far as concerns giving effect to the instructions of the late Board, and that, therefore, no blame attaches to that department as to the form of conveyance of the land in Whitecross-street, consider it probable that, if the Solicitor had explained to the Board the urgent necessity that there was both for ensuring that the persons to whom the land was conveyed were responsible persons and that the object of the Board's grant was attained, the present unsatisfactory condition of things would not have arisen.

(*c*) That the Committee have no opinion to express with regard to the action of the District Surveyor.

We recommend—

'That the Council do concur in the foregoing conclusions.'"

This led to a long and acrimonious discussion, in the course of which the report of the General Purposes Committee was denounced as lame and impotent, inconclusive, inconsequential, and evasive. It was asserted that by gross neglect in the Solicitor's department, a site worth 5,000*l.* had been made over to certain persons who were not the representatives of the costermongers. It was further asserted that the persons to whom the ground was conveyed had not observed the covenants as to the erection of buildings suitable for the needs of the costermongers, but had run up a jerry-built pile with bad bricks, and on bad foundations. The building was asserted to be so bad that even if the Council could reclaim the site, and re-enter upon possession, no outlay could make the present building suited to the wants of the costermongers. Successive amendments were moved, with the view of censuring the Solicitor, and of dismissing the clerk of works. As to the last-named, it was asserted that he must have been bribed; but in his defence it was urged that if he had not detected the malpractices of the builders, it was because he had too much to do, having had some forty buildings to look after at the time. Dissatisfaction was also expressed with the conduct of the District Surveyor. However, the report and recommendation of the Committee were eventually agreed to by a large majority.

The London Water-Supply Question.—The consideration of the special report of the Parliamentary Committee on this question was adjourned.

* See *Builder* for February 15, 1890, p. 119.

Proposed Supplementary Main Drainage Works.—The Main Drainage Committee reported as follows:—

"We have received the joint report of Sir Benjamin Baker and the Chief Engineer, prepared in pursuance of the instruction of the Council of December 17, 1889, upon the main drainage system of London. The report has been circulated amongst the members of the Council, and is receiving our careful consideration. We are not, of course, in a position at present to deal with all the important recommendations contained in the report, but as regards that portion of it which gives an approximate estimated cost of the proposed works for improving the existing system of main drainage on the north and south sides of the river, we are of opinion that these are of so urgent a character that no delay should take place in acting upon them. We therefore recommend—

'That detailed plans be prepared of the new sewers on both sides of the river as proposed by Sir Benjamin Baker and the Chief Engineer of the Council in paragraph 10 of their joint report upon the main drainage of London.'"

The consideration of this subject was also adjourned, after a very unsatisfactory explanation by the Chairman of the Committee as to the manner in which the report of the Engineers had been prematurely published in one of the daily papers.

After transacting other business, the Council adjourned until Friday next at 3 o'clock.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary fortnightly meeting of this Association was held on Friday evening, the 6th inst., Mr. Leonard Stokes, President, in the chair.

On the motion of Mr. E. S. Gale (Hon. Sec.), a vote of thanks was accorded to Mr. Arthur Cawston, not only for permitting the members to visit St. Philips' Church, Stepney, of which he is the architect, but for his kindness in meeting them at the church and conducting them over the building.

Mr. Gale also announced that the next visit will take place on Saturday, March 14, to the Tower Bridge works.

The Chairman stated that a Committee, which, for want of a better name, would be called the Reorganisation Committee, had been appointed by the general Committee of the Association for the purpose of endeavouring to make arrangements for carrying out the work of the Association in connexion with the new curriculum. The new Committee consists of seventeen members, viz., Messrs. Armstrong, Baggallay, Brodie, Collard, Farrow, Fleming, Florence, E. S. Gale, Goldsmith, Gotch, Leverton, Millard, Pryce, Searles-Wood, Seth-Smith, Stokes, and Paul Waterhouse. Any members who have any suggestions to make on the matter are desired to communicate with the honorary secretaries.

Mr. Basil Champneys then read a paper entitled "Some Principles and Methods of Design," which we print on another page

Mr. H. O. Cresswell, in moving a vote of thanks to Mr. Champneys, said that it was a long time since they had had read before them a paper so full of straightforward and honest advice, some of which they could all of them take to heart with advantage. Mr. Champneys could hardly have tackled a more difficult subject, embracing as it did the whole art of design; and the subject could hardly have been treated in a more masterly though at the same time simple way than it had been. As to the question whether architecture was an art or a profession, he thought that Mr. Champneys's paper furnished an answer; he (the speaker) thought there could be no doubt that architecture should be an art, while at the same time it must be, to a certain extent, a profession. Mr. Champneys had shown them how to secure an artistic design,—considered as a whole; that is to say, in plan, section, and elevation,—but he had also shown what care he had taken in keeping cost within the prescribed limits,—a purely professional matter. No doubt many of them would wish that in their own practice they were able to make such charming little arrangements as those by which Mr. Champneys managed to get twelve months to finish his design, filling up the interval by two or three sub-contracts for foundations, &c. No doubt an arrangement of that kind gave the architect time to study his design carefully, but how did it affect the ultimate cost of the building? In one point Mr. Champneys's paper was entirely at variance with many others that had been read in that room. Mr. Champneys distinctly told them *not* to begin by considering the plan; on the other hand, if there was one point which had been more impressed upon them than another in that room for years past, it was that they must begin by considering, not the elevation, but the plan. He (the speaker) thought that there was not the slightest doubt that Mr. Champneys was perfectly right; for if an architect started with a plan and laid down hard and fast lines from which he could not depart, he was storing up for himself difficulties which it would be difficult, if not impossible, to overcome. It was, therefore, of the first importance that the architect should consider his plan, section, and elevation all together, and he thought that Mr. Champneys was entitled to their thanks for having put that so clearly before them.

Mr. F. T. Baggallay said it gave him very great pleasure to second the vote of thanks to Mr. Champneys for his exceedingly clever paper. As Mr. Cresswell had said, it was a most useful paper for them, as it contained, in a few simple maxims, a fund of knowledge, which otherwise it would have taken them a great many years to acquire. He was very much struck with Mr. Champneys's injunction against being too clever. Over-cleverness seemed to be a general tendency of architecture in these days.

Mr. E. W. Mountford, in supporting the motion, said he had listened to the paper with very much pleasure; but, at the same time, he could not help thinking that while Mr. Champneys's method of obtaining time for the perfection of his design was conducive to artistic effect, it would have a tendency to very considerably increase the cost of the building.

The Chairman, in putting the motion to the meeting, said that on the burning question whether architecture was an art or a profession, he had not yet quite made up his mind. Architecture ought to be an art, certainly; but admitting that, he did not see how they were to get rid of the purely professional side of an architect's practice. Nothing would be more congenial to many of them than to confine their attention to the purely artistic side of their work; but the demands of clients with regard to practical matters would not allow them to do that. The average requirements of the ordinary client made it imperative that the architect should bring a certain amount of practical knowledge to bear in the conduct of his professional work. But Mr. Champneys seemed to admit that, for he had told them how he was in the habit of carefully cubing up his buildings; and that was hardly an artistic operation. Of course he understood Mr. Champneys's point to be that it was really an artistic problem to design a cheap and presentable building within the limits of cost. Where the amount available was small in comparison with the cubic contents of the building, then effect could be got by severity rather than richness of design, and the richness and elaboration of the design could be increased if more money were available. The paper was one of very great interest and value, and was well worth pondering over.

The vote of thanks having been carried with much heartiness,

Mr. Basil Champneys, in the course of his reply, said that it was not his experience that the method of carrying out a building in sections was necessarily the most costly one; in fact, he thought it would be found to be the cheapest method, for very often a builder whose tender was lowest for one section, was higher for all the other sections than any of his competitors. By his method, it would be possible to take the lowest tender for each section and he thought it would often be found that the aggregate contract amounts for all the sections would be less than any tender submitted for the whole of the work by any one firm.

The meeting then terminated.

Advanced Class of Construction and Practice.—At the meeting of this class, held on Wednesday evening last, in consequence of the inability of Mr. Collins to prepare his promised paper, Mr. Arthur T. Bolton read a paper on "Mosaics, chiefly dealing with his recent studies at Pompeii, &c.

STATUE OF AN M.P. AT DURHAM.—In a limited competition, Mr. Joseph Whitehead, of Westminster, has been selected to execute a statue to the late Mr. Crawford, M.P. for Durham. It is to be in Sicilian marble, with polished grey granite pedestal; and, when completed, will be erected in front of the Miners' Institute at Durham.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of this society was held at the School of Art on Tuesday evening last, when Mr. F. Fowler presided, and there was a large attendance of members. Mr. J. M. Brydon, F.R.I.B.A., of London, read an interesting paper on "The English Renaissance of the Seventeenth and Eighteenth Centuries." The paper was well illustrated by photographs, books, and fine contemporary engravings, lent by Messrs. J. B. Mitchell Withers and C. Hadfield. On the motion of Mr. Innocent, seconded by Mr. Mitchell Withers, and supported by Messrs. C. Hadfield and E. M. Gibbs, a hearty vote of thanks was accorded to the lecturer.

EDINBURGH ARCHITECTURAL ASSOCIATION. On the 7th inst. the members of the Edinburgh Architectural Association visited three old mansion houses situated between the West-end of Edinburgh and Corstorphine. The first was Roseburn House, which bears over the entrance the date 1582, and a shield with the Russell and Fisher or Foreman arms impaled, and the initials, "M. R. & K. F." Alongside of this there is a carved lintel with the date 1562, and containing the Royal arms of Scotland, with various inscriptions. The party next visited Stenhope Mill, an ancient and now somewhat desolate mansion. It bears over the entrance doorway the arms and initials of Patrick Eleis, a merchant and burgher of Edinburgh, with the date 1623. Inside, one of the plaster ceilings is decorated with various ornaments, amongst which are the insignia of royalty. The party next visited Saughton House, where they were received by Mr. W. Inglis Inquair Dickson, and shown over the mansion house, which, like the others visited, is strongly vaulted on the ground-floor, and contains on the upper floors some panelled walls, with fine fireplaces and plaster ceilings. On one of the ground-floor vaults there is a painted decoration containing the date 1694, with the initials "S. V." A vote of thanks to the leader of the party, Mr. Rose, brought the excursion to a close.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting of this Society on the 4th inst., Mr. J. W. Grover, F.S.A., in the chair, it was announced that the annual congress would be held at York in the autumn. The chairman exhibited a series of London antiquities found in Cannon-street, among which were manacles of iron of Roman date. Mr. Loftus Brock, F.S.A., described a large piece of Roman mosaic pavement, found in Gloucestershire, which showed the mode of construction from the high bed of concrete to the completed mosaic. Mr. Prigg announced the discovery of a Roman pottery kiln at West Stow Heath, Suffolk, where four others have already been found by him. He exhibited portions of the pottery which had been baked in the kiln, which are of peculiar design and texture. Other antiquities of Anglo-Saxon date were also exhibited. M. Marius Lungano announced the discovery of some curious relics of the English occupation which have been brought to light at San Gilles, near Bordeaux. Mr. Jarvis reported the entire demolition of the old manor house, Wandsworth. Mr. Lambert, F.S.A., sent for exhibition a metal vase, which was found a few years ago in the roof of his house in Coventry-street. It is the trade sign (the Golden Cup) of Peter Archambo, goldsmith, the founder of the business now carried on by Mr. Lambert. Mr. Earle Way exhibited a syllabub vessel dated 1657, found at Southwark. Mr. Oliver described a fine series of Dutch tiles from an old house recently demolished in the Whitechapel-road. A paper was then read by the Rev. Henry Baber on the parish of Ramsbury, Wilts, the seat of an ancient Bishopric in Saxon times. The proceedings concluded by the third portion of Mr. Micheal's paper on the signs of the old houses of the City of London, the eastern part of the city being dealt with. A series of drawings of the principal signs which still remain was exhibited by Mr. Barrett.

LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.—A meeting of the Lancashire and Cheshire Antiquarian Society was held on the 6th inst., Mr. W. E. A. Axon presiding, when communications were made dealing with the sculptured stones in Heysham churchyard, near Morecambe Bay. The papers were contributed by Mr. J. Holme Nicholson, and the Rev. Thomas Lees, Vicar of Wreay, Carlisle. Mr. Nicholson said the monumental stone in the churchyard was sculptured in the form known as Saxon hog-back or pre-Norman coped stone. In his paper the Rev. T. Lees gave it as his opinion that the carvings on the hog-backed stone represented the death of Adam. With regard to the carvings on the shafts of a cross near the churchyard gate, Mr. Lees gave an explanation of his belief that they had reference to the martyrdom of St. Philip.

SOCIETY OF ANTIQUARIES OF SCOTLAND.—The usual monthly meeting of this society was held on the 9th inst. in the Museum, Queen-street, Edinburgh, Mr. John R. Findlay, Vice-President, in the chair. Mr. Alexander J. S. Brook, F.S.A.Scot., gave a notice of four silver communion cups of the early part of the seventeenth-century, which belonged to the Scottish congregation of Campvere, in the Netherlands. In the next paper, which was entitled "The House in which John Knox Died," and which dealt with the house in the High-street, Edinburgh, called John Knox's house, Mr. Charles J. Guthrie gave reasons for accepting the substantial accuracy of the traditional statements regarding John Knox's house. Referring to the vicissitudes of the house in the High-street of Edinburgh in recent times, he noticed its condemnation by the Dean of Guild Court, and its rescue after a long controversy and public agitation, by the Society of Antiquaries' action in co-operation with the committee for its acquisition and preservation for the public. In the third paper Mr. Gilbert Goudie, the treasurer of the society, described a Norwegian deed of conveyance of land in Shetland, dated at Bergen, 1537. The last paper was a notice by Mr. H. F. Morlan Simpson, F.S.A.Scot., of a Swedish rune-staff or runic calendar of the eighteenth-century, the property of the Right Hon. the Earl of Southesk.

SURREY ARCHÆOLOGICAL SOCIETY.—The annual general meeting of this society will be held on Wednesday next.

ENGINEERING SOCIETIES.

INSTITUTION OF MECHANICAL ENGINEERS.—An ordinary general meeting of this Institution will be held on Thursday, the 19th inst., and Friday, the 20th inst., at 25, Great George-street, Westminster, by kind permission of the Council of the Institution of Civil Engineers. The chair will be taken by the President, Mr. Joseph Tomlinson. The following papers will be read and discussed, as far as time permits:—"Fourth Report of the Research Committee on Friction: Experiments on the Friction of a Pivot Bearing;" "On Recent Trials of Rock-drills," by Mr. Edward H. Carbutt, past-President, and Mr. Henry Davey, of London.

LIVERPOOL ENGINEERING SOCIETY.—The eighth ordinary meeting of the present session was held at the Royal Institution, Colquitt-street, on Wednesday evening, March 4, Mr. Ferdinand Hudleston, Assoc.M.Inst.C.E., President, in the chair. Prof. H. S. Hele-Shaw, M.Inst.C.E., read a paper entitled, "The Education of an Engineer." The paper commenced by explaining that apart from the general importance of such a subject as the education of an engineer, there was a special reason for its selection at the present time. Members of the Society were no doubt aware that a committee of the Council had been appointed for the purpose of taking any steps that might seem advisable to exert what influence they could as far as possible, so that such funds as might be devoted by the Liverpool City Council for Engineering education under the Technical Instruction Act might be applied in a way that would be satisfactory to the Engineering Society as a whole. It was pointed out that the scope of the profession of engineering was so wide as almost to defy definition, though the one given by Telford, and adopted by the great parent society, the Institution of Civil Engineers, had never been improved upon. A brief statement of the various branches was then given, and the various diverse modes in which a man might become an engineer illustrated by the early career of Whitworth, Brunel, Vignoles, Bidder, Rennie, Cubitt, Siemens, Bessemer, Fairbairn, Bramah, Maudslay, Ericsson, and others. These, though, of course, exceptional lives, served to show that it would be absurd to attempt to narrow down the channels by which those who had the natural ability should follow their bent and enter the profession. The question, however, arose whether there were not certain broad lines upon which engineering education might be best carried out.

Books.

Encyclopédie de l'Architecture et de la Construction. Directeur, P. PLANAT. Vol. IV. Deuxième Fascicule. Paris: Dujardin et Cie.

THIS is an important number of M. Planat's Encyclopedia, containing as it does such subjects as "États-Unis," "Ferme," "Fenêtre," "Flèche," "Fondations," "Fontaine," &c. The article on "Fondations" is by M. C. Bazin. He divides the subject into the study and preparation of foundations on a suitable soil, and the means of treating those which are naturally unsuitable. The first division is sub-divided into "general" and "special" methods, the former dealing however with the methods required in various cases, either as having reference to the contour of the ground or the manner of bearing of the building upon it. In the case of buildings resting on separate points, as when the building is carried only on piers at distant points (a method which the author remarks is becoming more frequent with the increased employment of iron structures), he takes the 25-mètre gallery of the Paris Exhibition buildings as an example, giving a description and small plan and section of the piers. These consist of masses of béton from 3·50 to 7 mètres high, according to the nature of the ground, and 2 mètres by 1 in area; this mass rests on the ancient and undisturbed soil of the Champ de Mars, which has naturally undergone much disturbance on its upper surface. On this is a mass of masonry, with a coping of cement on it for distributing the weight of the foot of the iron pier; on the cement is placed a thin sheet of lead "destinée à assurer complètement le contact entre le métal et la maçonnerie." In England this employment of lead has of late been demonstrated to be one of the worst methods that can be employed in regard to the bearing of weight on masonry. The greater tensile strength of cement (he does not say what kind of cement, but we presume it is Portland or its equivalent) does away no doubt with some of this objection, as rendering it much more difficult to tear the cement asunder by the friction and expansion of the lead, but if there is a weak point in the way of a crack or a want of cohesion anywhere in the cement tablet, the lead will be likely to find this out, and the advantages of it otherwise are somewhat doubtful. At the Crystal Palace a concrete pier alone was used, with the top finished smooth in cement, on which the iron base-plate was bedded, and in all probability this simple construction was more to the purpose than the more costly combination of concrete, masonry, cement and lead used for the French building.

The foundations of the church of the Sacré Cœur at Montmartre appear to have caused a great deal of trouble and expense, the soil being loose and friable to a great depth; beneath this loose stuff is a thick and substantial bed of gypsum; and a whole system of deep wells were sunk till the gypsum was reached, and then built up with pillars of masonry. These are connected by arches a short depth beneath the floor of the crypt, and it is considered that the gypsum bed beneath forms a connexion at their bases, and that in fact the weight of the structure is by this means practically distributed beyond the area of the piers. The section of the foundations shows what an unusual amount of subterranean work was deemed necessary before the actual building could be commenced; work which must have run away with a considerable amount of the building fund.

The small section of the foundations of the double-storied bridge called the Point-du-Jour Viaduct is of interest. The arches of the upper viaduct are double the number of those of the lower bridge, the intermediate upper piers being carried by a massive *pointed* arch of masonry in cement, filled up solid in the spandrels, and carrying down the thrust onto the real piers of the whole structure, masses of béton resting on a bed of flints.

The story of the foundations for the Paris Opera House is given at some length, and is an interesting account of a struggle with unusual difficulties of site. When the firm ground for a foundation had been apparently reached, a flood of water poured into the excavations, and for five months pumps were kept going extract-

ing a volume of water which it was estimated would have filled a cubic space of the extent of the Louvre site and twice the height of the Notre Dame towers. Eventually the water had to be accepted as an element of the situation, and the space was converted into an immense underground vaulted cistern, which is even now often filled with water, and is utilised as a storage against fire.

Among the "special methods" of course the employment of caissons comes in, and there is a description and illustration of the caisson foundations for the great Bon Marché establishment. The foundations of the Magasin du Printemps and of the Eiffel Tower are also illustrated. In the section on the treatment of foundations on naturally unfit and friable soil, where no other can be obtained, we have the illustration of the Austro-Hungarian Lloyd's house at Trieste, built on a sandy foundation. The bottom of the foundations was formed by a "grillage" of massive beams of larch-wood, covered with a layer of béton of one mètre in thickness, on which were built a series of massive footings of masonry in two courses, consisting of stones two mètres in length and about half a mètre in thickness; on these came the actual footings of the walls. The writer does not mention whether the timber received any special chemical treatment to ensure it against decay; an important point which seems to have been overlooked either in the work or in the description. This is the only instance in which the author goes off French soil; but as far as it goes the article is an interesting one and well illustrated.

The word flèche in French includes what we mean by "spire," at least it includes spire terminations to towers and lanterns, as well as the more restricted sense in which this borrowed word is generally used in England. The illustrations are little more catholic than usual, including several from Germany (it is to be hoped that in the present condition of French feeling this will not give offence to patriotism), and two from England, the steeples of Bow and St. Bride's. Is it possible that these are considered sufficient to represent English spires? Possibly a further treatment of the subject is intended under "Spirale," but as a rule French architectural students do not get further than London in the study of English architecture. The article "Fenêtre" takes us back to the æsthetics of architecture; the article is by M. Léon Benouville; it is largely illustrated, but with an immense preponderance given to classic types; Gothic ones are very sparingly and inadequately illustrated. Not a word as to the tracery of English Gothic.

Near to "Fenêtre" is the familiar name of "Fergusson," who is the subject of a short but sympathetic article by our good friend M. Chas. Lucas, who appears to have undertaken the notices of English architects (his name is appended also to an article on "Flitcroft"), and who knows more about English architects and architecture than the majority of his countrymen. Strictly speaking, however, it is a mistake to characterise Fergusson as "Architecte Anglais," inasmuch as he himself always said that he did not claim to be an architect, but only a student of architectural style and history. M. Lucas gives a full list of his works, and observes that in the multiplicity of subjects which he took up and illustrated he seemed to have wished to justify the idea of Vitruvius as to the cycle of knowledge necessary to the comprehension of architecture. But he rightly regards the History of Architecture as Fergusson's chief title to fame, and laments that no French translation has been made of so valuable a work. We hope that in the next volume justice will be done to Gwilt, who may be fairly termed the modern Vitruvius. The article on Flitcroft is a very good summary, and tells us more about this former London architect than, possibly, most London architects of the present day know of. "Française (architecture)" is the subject of a long un-illustrated article by the editor, which seems rather superfluous, as the subject had been treated at great length and with numerous illustrations under the much longer article "Architecture" in the first volume, in which architecture is practically treated as if it were a peculiarly French art. Under "Gare" there are plans, sections, and views of a good many railway-stations, including Charing Cross and Paddington; St. Pancras might surely have taken precedence of these; its Gothic style is somewhat *prononcé* and is out of date now, but it must still be recognised as architecturally the most remarkable railway-station in London.

The article on "États-Unis," by M. Brincourt, is long and fully illustrated, and the subject appears to have interested the author very much. He concludes with the remark that "The architecture of the United States, a combination of different styles and schools, appropriated to the peculiar and new requirements of a people essentially practical and industrial, is full of instruction."

We are glad to see M. Planat's work advancing as rapidly as can be expected in an Encyclopædia planned on so large a scale, and wish it a continuance of success to the close.

A Digest of the Law and Practice of Letters Patent for Inventions. Second edition. By Clement Higgins, Q.C., and G. E. Jones, Barrister-at-Law. London: W. Clowes & Sons, Limited. 1890.

The Patentees' Guide. Information for all Sorts and Conditions of Inventors in all Parts of the World. By H. F. Boughton, Patent Agent. London: Simpkin & Co., Limited. 1890.

Mr. Higgins' "Digest" is already well known, It is a useful companion to treatises on patent law. We may remind our readers of its form. The cases are collected under various heads, such as "Novelty," "Patentee." The name of the case and the year in which it was decided are given in large letters, and then follows a précis of the facts, and the legal result. For example, under the head of "Betts *v.* Weilson," we find the following:—"In order to establish the prior public use of a patented article, so as to invalidate the patent, it is not necessary to show that the article has been manufactured for sale." There is no question that the work is useful; it would have been more so with an index.

The second work at the head of this notice is quite of a different character: it is essentially popular; perhaps too much so. Thus, under the heading of "Buyers of Patents," we are told that "there are capitalists who make a regular business of speculating in the purchase of patents," and similar information of an unprecise and not very useful character is given. But a reader will obtain from the book a fair general idea of the law and practice in regard to patents, and the colloquial and general character of the book renders it easy reading. But, except for those who desire to obtain a sort of general knowledge of the subject, it will not be of much service.

The Planning of Ornament. By Lewis F Day. Second Edition revised, with additional illustrations. London: B. T. Batsford. 1890.

We noticed at some length the first edition of this excellent little book, and have here only to record the appearance of the second edition, with some improvements, and to recommend it anew to the attention of students of ornament.

The Year's Art. By Marcus B. Huish. London: Virtue & Co. 1891.

This is the volume for 1891 of this useful compilation, which records the principal artistic events of the year, and gives small pictorial reminiscences of the principal pictures, &c. The number for 1891 also contains a number of well-executed portraits of leading artists. In other respects the volume quite keeps up to the standard of its predecessors.

SOME TRADE CATALOGUES.

Messrs. O'Brien, Thomas, & Co., of Upper Thames-street, send us their new illustrated catalogue of goods manufactured and sold by them. These include builders' hardware of all kinds, including stoves, ranges, grates, rain-water heads and pipes, gates, and railings; overmantels and chimney-pieces; stable fittings; baths, water-closets, and sanitary appliances of all kinds; door, window, and blind furniture; mouldings, doors, sash-bars, and balusters; and a thousand-and-one other items needed by the builder. The catalogue is a very well got up and comprehensive production, and, as all articles are priced, it will serve as a valuable guide to architects and builders.

Messrs. F. W. Reynolds & Co., of Southwark-street, send us their new "Architects' Illustrated Catalogue of Builders' and Contractors' Hardware." This also is an exceedingly compr hensive and well got up production, and cann fail to be exceedingly useful to architects ar builders. It deals with a wide variety of good stoves, grates, ranges, bakers' ovens, chimne pieces, and overmantels; locks, bolts, bars, ar hinges; fire-irons, fire-dogs, hearth and jan tiles, &c., &c. A good idea seems to be th embodied in what is described as a "patent speaking-tube, figured on page 207 of the cat logue. The patent consists in having two ope ings at each end of the ordinary tube,—one f speaking through, the other for listening,— that a conversation can be carried on throu this tube as rapidly and as easily as with telephone, if not more so.

Mr. Samuel Elliott, of Banbury, whose joine and mouldings are so favourably known to ma of our readers, has sent us his "Moulding Cat logue, No. 7," which is well worth attention. T sections are all given full size, and the sectio are so drawn and shaded as to show the exa appearance of the mouldings, *minus* the colo of the wood. The mouldings turned out Mr. Elliott are, as we have had occasion to s when they have been exhibited at Islingto exceedingly sharp and well-finished. The cat logue will be found to contain an immen variety of sections, and will be found ve useful. Architects who do not find in exactly what they want can readily get ma at Mr. Elliott's mills mouldings of any desir section.

Mr. Archibald D. Dawnay, of London Brid House, sends us what is something in t nature of a trade catalogue, and something an engineer's pocket-book. It is a booklet co taining various sections of steel and iron joi and girders, with tables of strengths and sa distributed loads. It is likely to prove ve useful.

Messrs. Baird, Thompson, & Co., of Que Victoria-street and Glasgow, send us th "Revised Catalogue" of ventilating and heati appliances, of which there is a great varie illustrated, described, and priced in the cat logue. We understand that this firm ha lately appointed Mr. James Cousland (former with Messrs. Robert Boyle & Co.) to be th London manager.

ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN.

At the March meeting of this Association, he on Saturday last, with Mr. Hugh Alexander in t chair, a paper on "Public Baths and Washhou in the Metropolis" was read by Mr. W. Midd week, Superintendent of the Kensington Baths a Washhouses, who was formerly Sanitary Inspect of Kensington. After declaring his complete ceptance of the doctrine held by the first Presid of the Association (the late Sir Edwin Chadwi that sanitation, in the widest sense of the ter was included in the one word cleanliness, t lecturer bewailed the ignorance and apathy th existed among the public with regard to his subje Through this apathy the Public Baths and Wa houses Act had so far been to a great extent failure, the Act remaining almost a dead let The development of the movement, from 1854, wh Shoreditch adopted the Act, down to a much m recent period, when after an eight years' strug Kensington was able to get a suitable freeh site, at a cost not absolutely prohibitive, w traced by the author. The site difficulty h been the obstacle everywhere, fabulous prices bei asked whenever a public body required to purch freehold land. The offer of a premium of 100*l.* h failed to disclose a suitable site in Kensington, a in the end the Commissioners were compelled to to Parliament for a compelling Act before they w able to obtain the land on which the present ba were built. The extension of the benefits of t Act in a population of 5,000,000 was an imperati necessity; but, unless the London County Cou and similar bodies elsewhere were granted pow to compulsorily acquire sites for the purpo that extension must necessarily be slow. Anot difficulty was the inequality with which the i perial and municipal imposts were levied in differe parishes. In Kensington, during the past year, large sum of 319*l.* had to be paid upon the es blishment for local rates, busides nearly 40*l.* Queen's taxes. In St. Pancras, on the contra which had two establishments, no parochial ra were paid, and only a little over 30*l.* in Que taxes for the two institutions. Another difficu was how to prevent the unfair use of the wa houses by laundresses who, in using them with charge, as in some parishes, gained an unfair vantage over other tradespeople at the expense the ratepayers.

There was a good attendance, and the Chairm and several of the members took part in the disc sion of the paper on the motion of a vote of than which was subsequently cordially given.

Correspondence.

To the Editor of THE BUILDER.

E SANITARY CONDITION OF SCHOOLS.

R,—As there is, perhaps, no subject at the present ent of greater importance than the proper and ient ventilation of schools, I venture to suggest . Mr. W. P. Buchan might supplement the notice is address at the Philosophical Society, Glas- , which appeared in your columns of the 28th ult., iving a short explanation of his objections to the ngements at present adopted by the Glasgow ol Board, together with his suggestions as to alterations necessary to make these faulty ngements more perfect.

he state of the atmosphere in the rooms may be n as eloquent testimony to the *fact* that the sems in use are faulty. The important questions, ever, are: What is practically wrong, and how it be made right?

few facts and figures would, I am sure, be of t value to architects, in all parts of the country, nless, indeed, every School Board acts like the gow Board, which has, according to Mr. Buchan, n this work out of their architect's hands.—

"SANITAS."

The Student's Column.

VENTILATION AND WARMING.—X.

LPERTS FORMULA AND ITS APPLICATION.

(*Continued*)

A FEW other typical examples, in addition to those in our last chapter, we may also consider, so that we may be e clear as to the method of applying our nulæ to particular cases.

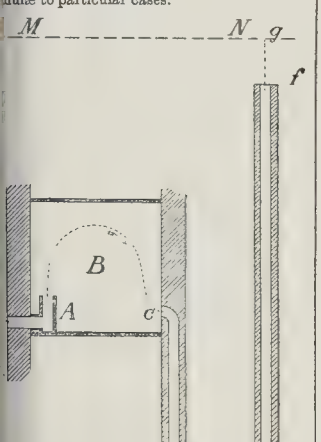


Fig. 7.

n fig. 7 we will suppose a room, B, heated by ove or other apparatus, A, within it, instead elow it, as in our last example, and that fresh air, entering from without, is warmed the heating apparatus A, and, after passing ugh the room, is carried off by the flue *ef*, finally reaching M N, the limit of equal cific weight at *g*. We will suppose the flue e carried downwards and horizontally, as wn, for some special reason in the planning the building. This should, of course, not be e if it can possibly be avoided, for such an angement entails a considerable loss of ciency. The motive column of cold air is he height *a b*, while the warm air column t has to be moved by the greater weight of cold air column is of the length *c d e f g*, hat in our general formula (20) we have a ue for *h*, and a considerable value for Σ C by son of the friction, and the angles at *d* and *e*, le for H we have *a b* less *f g*, as we have ady explained in considering the problem strated in fig. 5.

et us now suppose some still simpler mples. In fig. 8 we will assume that the is entering by a Tobin's tube at *b c*, and an let is provided near the ceiling level into a *d e*. As long as the temperature of the m and of the air in the flue *d e* is higher n the external atmosphere, the column *a b* of cooler air will exert pressure and cause movement; *a b* will be the value of H in our formula, and the velocity of the flow can be calculated for any given difference of temperature. If, however, the external tempera-

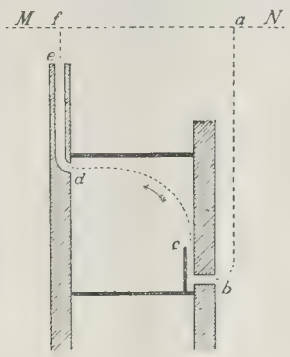


Fig. 8.

ture is higher than that of the room and the flue, the column *a b* will be the lighter, and the direction of the current will be *e d c b a*, the value of H in our formula being the vertical height of *e* above *b*.

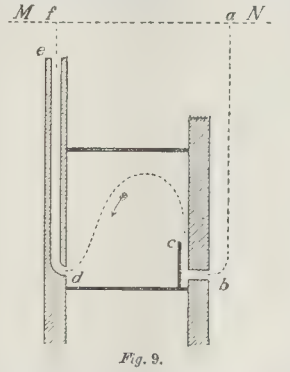


Fig. 9.

If we have in another case the Tobin tube as before, but the outlet near the floor level, as in fig. 9; *a b*, the height of our external column, will still be the value of H as long as the external atmosphere is colder than that of the room and the flue. The weight of the column of air in the Tobin tube will, however, give us in this case a value for *h*. As in the preceding case, when the external atmosphere is the warmer, the current is reversed.

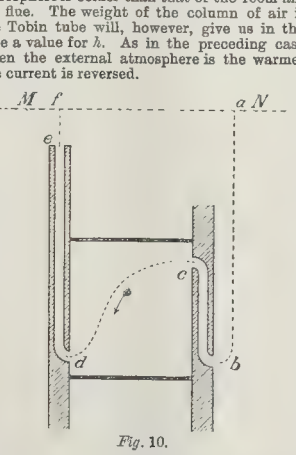


Fig. 10.

If, instead of a Tobin tube, the air is brought by a duct formed in the wall, as it might be occasionally for various reasons, the action is similar to that in the last two cases. In fig. 10, let us suppose the inlet to be near the ceiling level, at *c*, and the outlet near the floor level, at *d*. The value of H is still the height *a b*, but *h* has also a value for the resistance of the column *b c*. Such an arrangement as here shown accordingly results in a considerable loss of power, to avoid which, the duct *c b* should be above *c*, not below it.

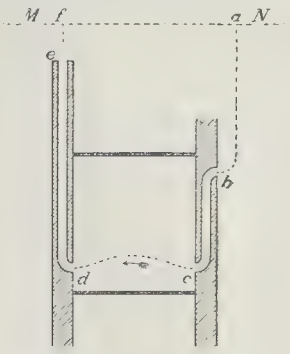


Fig. 11.

In fig. 11 we assume a similar case to the last, except that the inlet is near the floor at *c*, and on the same level as the outlet *d*. When the temperature of the column *a b c* is lower than that of *d e f*, there will be a movement of the air in the direction of the arrows, the motive power being the superior weight of the air column *a b c*. If the temperature of both the air columns is the same, their weight will also be the same. Again, if *d e f* be of the lower temperature, the movement will be in the opposite direction to that of the arrows, that is, in the direction *f e d c b a*. From this example we see that it is erroneous to talk of "siphon" action in ventilation. The longer *d e* and the shorter *b c* correspond, it is true, with the longer and shorter legs of the siphon; but whereas the longer leg of the siphon is and must be the delivering one, we see that here, although the two flues or ducts are of different lengths, either or neither of them may be the outlet, and their action or inaction entirely depends upon their temperature, and is completely independent of any siphon principle. The term "siphon" ventilator, therefore, we must consider to be merely a pretty and fanciful name for quite a different action.

From our consideration of these various cases we gather that the height of the flue containing the column of warm air above the point of entry of the cold air is the most important point in any ventilation depending upon difference of temperature for its motive cause.

GENERAL BUILDING NEWS.

THE PROPOSED NEW RAILWAY STATION, EDINBURGH.—The elevations of the proposed new Caledonian railway-station at the west-end of Princes-street, Edinburgh, prepared by Messrs. Peddie & Kinnear, architects, have caused much disappointment, owing to their being undignified and inappropriate to so prominent a site. The architects explain that their instructions were to prepare a design for a building of a single story, and that they have endeavoured to give as dignified and architectural an effect to the building as was possible under the circumstances. Were the directors to sanction the addition of another story towards the Princes-street end of the station, it could be utilised as residences for some of the railway officials, and meet the views of the public. Some years ago Messrs. Peddie & Kinnear prepared plans showing a large hotel (such as that at Charing Cross) in connexion with the east end of the station, but that idea appears to have been abandoned.

NEW WELSH CHAPEL, SWANSEA.—A new chapel for the Welsh Baptists has just been opened at Swansea. The new chapel is built on Corporation land in Orchard-street. The contract was let to Messrs. Thomas, Watkins, & Jenkins at 2,500*l.*, and the total cost, including site, will be 3,530*l.* Seating accommodation is provided for 1,000 people.

NEW WESLEYAN CHAPEL, ATTERCLIFFE, SHEFFIELD.—The new Wesleyan Reform Chapel in Bodmin-street, Attercliffe, has just been completed. The chapel is 66 ft. long, 53 wide, and will accommodate 400 persons on the ground-floor, and 150 in the gallery, which runs across one end of the chapel. There are also two vestries and a kitchen on the ground-floor, above them being four class-rooms and under them a number of cellars. The internal fittings are of pitch pine, and the front of the building is faced with pressed brick and has Grenoside stone dressings. The building is warmed on the high-pressure hot-water system, and ventilation is obtained by means of patent extraction

ventilators. The cost of the building has been about 1,750*l.* Mr. E. Winder, jun., architect, Sheffield, prepared the plans and specifications, and Mr. J. Greenwood was the contractor.

NEW BANKING PREMISES AT CARDIFF.—The National Provincial Bank of England have taken possession of their new and altered premises, which have just been completed, from the design of Mr. Chas. R. Gribble, architect, London, by Messrs. S. Shepton & Son, contractors, of Cardiff, Mr. Grimes being clerk of the works. The basement of the premises consists of three new strong-rooms. The banking-room is 60 ft. by 32 ft., and is ventilated through to the roof with two steel shafts, 18 in. in diameter. The walls are divided into panels and the ceilings into bays with moulded panels. The customers' space in front of the counter is laid with a mosaic floor, and the room is heated by hot water by Messrs. Phipson, of London. At the rear of the banking-room is the manager's room, 18 ft. by 14 ft., fitted out in teak. On this floor another strong-room is situated. A porch has been added to the front of the building. From the basement to the banking-room is fitted with an hydraulic lift. The lighting of the premises will be with gas, with wires laid on for the electric light. The cost of the whole of the work is between 7,000*l.* and 8,000*l.*

RENOVATION OF THE SCOTCH CHURCH, CARLISLE.—During the past year the Scotch National Church, Chapel-street, Carlisle, has undergone various alterations, &c. These have been carried out by Mr. T. Taylor Scott, architect, Carlisle. The alterations consist of the removal of the roof and flat plastered ceiling, raising the gables at each end of the building, and the erection of a new roof. The old gallery has also been renovated, the greater portion of the floor being re-formed. The body of the church has been re-seated. The old stone floor of the church has been taken up and removed and a new boarded ventilated one constructed. A new pulpit of pitch pine has also been erected. The entrance to the church has been improved by the removal of the old vestibule, and the erection of a new one, and at the rear of the church a vestry has been erected. The two windows on each side of the pulpit have been filled in with stained glass. Mr. W. Pattinson was the builder, and the stained glass has been executed by Mr. Swaine Bourne, of Birmingham.

NEW MARKET FOR CADOXTON AND BARRY.—On the 7th inst. the new market buildings situate in Court-road and Barry-road, Cadoxton, erected by Councillor W. Symonds, of Cardiff, for the Barry Dock Town (Cadoxton) Market Company, at a cost of about 3,000*l.*, from plans prepared by Messrs. Seward & Thomas, architects, Cardiff and Cadoxton, were opened for public purposes. The market is 120 ft. by 60 ft., with approaches from Court-road, Barry-road, and the new road to Holton. The roof trusses are of ironwork. Along the centre of the roof, and extending the whole length of the ridge, is a lantern light, glazed with Shelly's patent system of glazing, with louvres and shutters for ventilation. The floor will be paved with Staffordshire brick tiles. Lock-up shops, &c., will be arranged along the sides. At the end of the hall there are retiring-rooms, so that the hall (which will accommodate about 3,000 persons) can be used for the purposes of concerts, or public meetings. It is intended to further extend the market, and to erect shops, a small public-hall, and offices around it.

NEW CHURCH OF ST. DAVID'S, GLASGOW.—The ceremony of laying the foundation-stone of the new church for Free St. David's congregation, Glasgow, was performed on the 7th inst., by Lord Provost Muir. The site of the new building is in Cromwell-street. The church will be seated for 700 persons. Mr. Wm. Bennett is the architect, and Messrs. A. Muir & Son the builders.

NEW INSTITUTE, PRINCES RISBOROUGH, BUCKS.—The new Institute here was opened last week; it is presented to the town by the Right Hon. Lord Rothschild, who is a considerable landowner here. The building is of red brick, covered with Broseley tiles, and has a front to the High-street, with bay-windows extending up to a overhanging, half-timbered gable of the domestic style of the Elizabethan Period. On the ground-floor is a reading-room and committee-room, with lavatories in the rear. All the rooms on ground-floor are paved with wood blocks. The first-floor has a lecture-room, with an open ceiling, and cloak-room adjoining. The chimney pieces are of wainscot oak; other fittings in pitch pine. The architect is Mr. W. F. Taylor, of Aylesbury, and the work has been carried out by Mr. Geo. Green, of Aylesbury, at a cost of about 1,200*l.*

REOPENING OF SLAITHWAITE CHURCH.—On the 5th inst., Slaithwaite Church, Yorkshire, which is over a century old, was reopened, after having been closed for months for alterations. The estimated outlay for the restoration is about 4,000*l.* The work has been carried out from the designs and under the superintendence of Messrs. John Kirk & Sons, architects, Huddersfield.

NEW MARKETS, CARDIFF.—New markets are being erected at Cardiff from plans by Mr. W. Harpur, M.Inst.C.E., County-Borough Engineer. Mr. W. Allen is the general contractor. We understand that the shops and stalls (144) are being fitted up with improved revolving shutters, manufactured by A. Attwood & Co. (formerly Salmon, Barnes, & Co.), Ulverston.

SANITARY AND ENGINEERING NEWS.

UTTOXETER WATER SUPPLY.—Mr. W. H. Radford, C.E., was lately instructed by the Uttoxeter Rural Sanitary Authority to prepare a scheme for the improvement of the water-supply to the town of Uttoxeter. The present waterworks belong to a charity, and are inadequate. The reservoir and filter-beds are too low in level to supply the town efficiently. The mains are too shallow and partially stopped up, and otherwise in bad condition. The authorities have not had sufficient powers to exercise proper supervision over the consumers' fittings. The present supply is taken from a spring about a mile and a-half from the town. The spring is of good quality, but insufficient in quantity. Between the spring and the reservoir the water flows down an open brook, where it is liable to contamination. There are a number of private rights of supply along the course of the brook.—Mr. Radford advises the abandonment of the present reservoir and filter-beds and the taking up of the present water-mains. A portion of the present spring would be used for compensation water, and the remainder conducted into a new covered reservoir to hold 150,000 gallons, and to be placed at a higher level near the spring. New water-mains would be laid through the town, such of the present pipes as are suitable being re-used. Consumers' fittings would be tested and replaced where defective. An additional supply of about 32,000 gallons a day is likely to be required, and Mr. Radford advises the Authority to acquire certain springs at Somershall Herbert, about 3½ miles from the town. These can be brought to the town by gravitation. This part of the scheme can be left until the necessity for the additional supply is actually proved. The population of Uttoxeter is 5,000. The cost of the new scheme for works only is estimated at 3,800*l.* If the additional supply is required, the extra cost will be 1,650*l.* The Sanitary Authority propose to proceed with the first part of the scheme.

HEREFORD SEWAGE.—Colonel Ducat, R.E., Local Government Board Inspector, held an inquiry at the Guildhall, Hereford, on the 3rd inst., in regard to an application from the Town Council for sanction to borrow 4,500*l.* for sewage disposal, and 4,000*l.* for the extension of the sewerage system of the city to Hampton Park, Aylestone Hill, and Burcott Row. The Town Clerk (Mr. J. Carless, jun.) appeared on behalf of the Town Council, and plans were produced by the City Surveyor.

HATFIELD SEWERAGE.—Colonel Luard, R.E., held an inquiry on behalf of the Local Government Board on Tuesday last at the Public Hall, Hatfield, the Rural Sanitary Authority having applied for sanction to borrow 2,000*l.*, for works of sewerage and sewage disposal. There was no opposition to the scheme, the plans for which were prepared by Mr. G. M. Lawford, Assoc.M.Inst.C.E., of Victoria-street, Westminster.

FOREIGN AND COLONIAL.

FRANCE.—The Louvre has just received the last completed work of the sculptor Giraud, who died in the last years of the reign of Louis Philippe. This work, left by the late M. Montenard, represents a woman draped in antique fashion, holding a sleeping infant, and with another child sleeping at her side. The group was designed as a funeral monument.——The "Union Centrale des Arts Décoratifs" is intending to hold in the spring of next year an exhibition of a combined artistic and horticultural character, with the object of illustrating the part which plants have played in the history of ornamental art in all ages and among all peoples.——M. Georges Berger, the new President of the "Union Centrale," is understood to have the intention of pushing strongly with the Government the scheme for the construction of a museum of decorative art on the site of the Cour des Comptes.——M. Allar, sculptor and former holder of the Prix de Rome, has been appointed to succeed the late M. Delaplanche as professor of modelling in the École National des Beaux-Arts.— M. Simón Luce, member of the "Académie des Inscriptions et Belles Lettres," has discovered in the National Archivos documents which fix the locality of the house of Duguesclin between 1372 and 1380. A commemorative tablet will be fixed on the site in the Rue Vieille du Temple.——The Municipality of Saint Ouen is going to avenge the expulsion of Marat from the Parc de Montsouris by erecting a bust of him in the council-room of the Mairie of that town.——Another fierce figure of the Revolution, Danton, is to give his name to a new square to be formed at Paris abutting on the Boulevard St. Germain, on the site of a group of houses bounded by the Rues Eperon, Danton, and Serpente, which has been demolished.——M. Falguière has just gone to Chambéry to study the most favourable site for the monument to be erected to commemorate the hundredth anniversary of the union of Savoy with France. He has selected the Place on the axis of the Pont Reclus. The monument is to be erected by public subscription in the department of Savoy alone. Fifty thousand francs have been already collected.——A competition has been opened at Rambouillet for the establishment of a new water-supply for domestic purposes.——M. Roger Ballu, Inspecteur des Beaux-Arts, has been invited by various literary and artistic clubs of Belgium to give some lectures on Meissonier at Ghent, Brussels and elsewhere.——M. Marchandier, architect, of Neuilly-sur-Seine, has just died at the age of 46. He was a pupil of the Ecole des Beaux-Arts and of Constant Dufeux, and had been successful in various competitions, of which one of the most important was that for the Prefecture building at Tuile. He was a member of the Société Centrale.——The death is also announced of M. Vésignié, a former naval engineer. He was a distinguished man in his profession, and designed most of the steamers for the Messageries Maritimes.——The Municipality of Paris is about to open shortly a competition for the erection of a statue of Beaumarchais on the boulevard of that name near the site where the poet formerly lived.——At the Institut, the Committee concerned with the candidature for the position filled by the late Baron Haussmann has recommended the names of M. Alphand and M. Duplessis, the former by preference.——At the École de Beaux-Arts the competition for the Achille Leclère prize has been decided, and the prize awarded to M. G. Beleston, pupil of MM. André and Lalouze.

BERLIN.—Miss Schinkel, daughter of the renowned German architect Schinkel, died last week, and has left a valuable collection of architectural drawings, works of art, &c., the former property of her father, to the Royal Technical College of Berlin.——The great annual Schinkel competition for the medal and travelling studentship has again been a failure; only three candidates having sent in designs for the subject set, and none of these designs being found deserving of medal or prize. The late continual failure of this formerly important competition has been the subject of strong comment at the "Architekten-Verein," where several members consider that the present system of the education of architects is by no means satisfactory. At the "Architekten Verein," the proposed division into two distinct groups (1) for architectural art and archæology, and (2) for construction and civil engineering has now taken place. Division No. 1 will work under the presidency of "Baurath" Wellot, architect of the new Houses of Parliament in course of erection. "Baurath" Hossfeld, of the Ministry of Public Works, acting as vice-president.——An address bearing over 3,500 signatures of architects and civil engineers, has been presented to Geheim. Ober Baurath Schwedler, of the Prussian Ministry of Public Works, who resigned his post on March 1. Among the 3,500 who wished to do honour to Brth. Schwedler, some 500 are non Germans, and of these a large contingent are English and Americans.——An extensive scheme for opening up the centre of the city, by cutting through some new thoroughfares, is to be taken in hand this year. the Municipality having sanctioned the idea, and the financial part having been arranged by some large banking firms. Among some of the large buildings which will have to be demolished in connexion with this scheme, we may mention the "Victoria Theatre," remarkable for its having two auditoria to a mutual stage, measuring some 35-m in length, 25 m. in width, erected some thirty years ago by Langhaus, architect of the Berlin Opera House.

STUTTGART.—A small so-called "International" Art Exhibition was opened here on March 1 Prince William, President of the Committee of Management, in opening the Exhibition, gave an address on Art. Austria, Italy, France, Spain, the Netherlands, and England are represented.

competition for designs for the laying-out and planning of an extensive colony of workmen's dwellings has been opened. According to the "programme" the dwelling-houses are to be built either detached or semi-detached, each building being planned for at least two and not more than six families, each of which are to have their own piece of land for gardening purposes adjoining to the house. A terrace of shops, a co-operative store of large dimensions, an eating-house and large assembly rooms will have to be found room for in separate buildings. Special stress is laid on having the façades of the dwelling-houses picturesque and varied.

SCHWERIN.—A monument in the form of a statue is to be erected to the memory of Schliemann, at Schwerin. The Grand Duke of Mecklenburg, under whose presidency a committee has been formed, has headed the list of subscribers with 50*l.*

FIRST USE OF THE WORD "HYGIENE" IN ENGLISH.—Mr. Edward Peacock, writing to *Notes and Queries*, says:—"It is useful to have a note of the first appearance of a word in our language. At the end of the first volume of the third edition of Southey's 'Letters Written during a Journey in Spain' occurs a translation of the 'Rules of the Royal College of Surgery at Madrid, founded by Carlos III. 1787.' Here we find that the second professorship 'shall be of Physiology and *Hygiè*' (p. 303). To this word the following note is attached:—'I do not understand this word, perhaps it means the doctrine of health.' Southey was a great reader, and had a verbal memory such as the votaries of *Notes and Queries* might envy. It is obvious that he had never met with *hygi* before."

MISCELLANEOUS.

THE CENTRAL LONDON RAILWAY SCHEME.—r a moderately stout contest, the Bill for con-cting an underground electric railway from the to the West-end has again been approved by a ct Committee of the House of Commons, as it last year, when it was rejected by the Upper se. During the interval the scheme has been erially enlarged, the City terminus as now pro-d being in Cornhill, and the western terminus at pherd's Bush, instead of at Queen's-road, Bays-er. The effect of this change has been to in-se the length of line from four and a-half miles x miles, and at the same time to remove the ion for generating the electricity from the rded neighbourhood of Bayswater to a point her out in the suburbs. In other main fea-s the proposal is the same as last year, but it is h noting that in deference to the Dean and pter of St. Paul's, the station which previously to have been placed nearly opposite, and very to the Cathedral, has been removed in plans, and thus the opposition from that ter has been met and disposed of. year thirty-seven petitions were presented nst the Bill; on this occasion that number was ced to twenty-seven, and the bulk of these e based either upon a claim to payment to ers for the use of the subsoil or upon alleged s of damage and disturbance to property along route. The evidence taken was almost confined ne engineering and electrical aspects of the case, other issues being dealt with in the main only in speeches of counsel; but Mr. Walmisley, , maintained that the project would not any injury to adjacent property, while Mr. rs, land surveyor and agent in the City of don, declared that during forty years' experi-e he had never known a case in which a railway pany or any other company had paid compensa-for the sub-soil of the street. Other eminent sses, such as Sir Benjamin Baker, C.E., Sir n Fowler, C.E., and Mr. Greathead, C.E., like-contended that no damage would accrue to dings through construction or working; and on point whether or not pumping would cause sidence, they explained that by an express se in the Bill the promoters were forbidden to rt to pumping.

LIQUID FUEL FOR LOCOMOTIVES.—The *Daily raphic* of the 7th inst. gives an interesting account run from Ipswich to London on express loco-ive No. 759, belonging to the Great Eastern way Company. This locomotive is fed with id fuel, consisting of a thin tarry refuse which ains from the manufacture (from shale-oil) of gas for lighting the railway carriages. The motive appears to be entirely successful, the from Ipswich to Liverpool-street (nearly 70 es), being accomplished in 88 minutes. It ears from the details given that the liquid fuel much more economical in its results than coal. Mr. James Holden, the Locomotive Superin-dent, is due this important departure in loco-ive engineering.

ACQUISITIONS BY THE SOUTH KENSINGTON SEUM.—The *Athenæum* states that the South sington Museum has obtained the entire lining room, *temp.* Elizabeth, from Sizergh Castle, stmoreland, about 120 ft. run in all, and nearly t. high. It consists of panels of dark oak inlaid holly and ebony, and divided by quasi-nthian pilasters supporting a cornice and blature. The same journal states that the en and well-carved front of the old house of Sir l Pindar, recently removed from Bishopsgate-et Without, has been carefully and suitably aired and cleaned, and will in a few days be ted in one of the courts of the Museum.

MARBLE WORK.—We have received from Messrs. H. Patteson, of Manchester, a pamphlet giving tographic illustrations of various works in ble carried out by them under different archi-s, including the main entrance to the Lanca-re and Yorkshire Bank (Messrs. Heathcote & le, architects), and the banking chamber in the e building. The latter is a very elaborate e of work, the walls being entirely faced with ble above the dado; Rouge Jaspé marble is loyed for the wall surfaces with narrow bands Pavonazzo; door-frames, door-pediments and sters of Pavonazzo. The effect, judging from photograph, is very rich and sumptuous.

PROPOSED NEW SOCIETY OF ARTISTS.—We it is extremely likely that an attempt will made to translate the Société des Vingt de xelles into English, and form a London Twenty . The idea is to get the twenty artists together consider themselves the best outsiders,—that say, neither Academicians nor Associates,—then let them jointly acquire or hire some ure-gallery for the purpose of exhibiting their ks. The wall-space available would be divided twenty different sections of equal size, their ment to be determined by ballot. Each ber would then have his own space, h he might decorate and arrange as pleased, and whereon he might display as y of his works as its limits allowed, or as few is judgment advised. Over each section would oldly blazoned the name of the artist. Such ociety, in the face of the facts that the Grosvenor has disappeared, and that the New is somewhat too partial to particular schools, would undoubtedly cause justice to be done to certain men who, under existing circumstances, are likely to have their claims somewhat slighted. The difficulties in the way of its realisation are the scarcity of suitable galleries, and the fear those men who press closest against the gates of Burlington House might feel that their support of such a scheme would prejudice their chances for admission to the Academy.—*The Speaker.*

CHICAGO CARPENTERS.—A strike is threatened by the carpenters of Chicago, who will come out on April 1 unless the differences between them and their "bosses" as to wages are adjusted before that date. Last season 3,000 carpenters struck. Their union has increased since then to 6,000 members, and they will have this year also the support of the new Building Trades Council. With the exhibition buildings in progress, a strike would be a serious matter.

REGISTRATION OF PLUMBERS.—An adjourned meeting of the Liverpool registration committee of the National Registration of Plumbers was held in the Free Library, William Brown-street, on the 5th inst. Dr. J. Stopford Taylor (Medical Officer of Health for Liverpool) occupied the chair, and was supported by Dr. Vacher (Medical Officer of Birkenhead), and by the trade representatives. Mr. Coard S. Pain, engineer to the Northern Sanitary Association, and a member of the Committee of the School of Science, was elected a member of the Registration Committee.—Mr. Pain thanked the Committee, and stated, on behalf of the School of Science, that they were anxious to assist in every way the scheme of registration of qualified plumbers, technically instructed and examined.—The hon. secretary (Mr. Watkin Hall, C.E.) submitted a number of applications for admission to the register. After dealing with these, the Committee directed the secretary to report to the board of examiners that some twenty-six applicants were now awaiting examination. During the evening sixteen certificates were issued to successful candidates.

SCHOLARSHIPS FOR BUILDING ARTISANS.—The Bristol Builders' Association have lodged with the Town Clerk, a memorial for presentation to the Town Council, asking the Corporation to establish 200 scholarships of 2*l.* apiece, to be awarded annually, under such conditions as may be thought desirable, to *bonâ fide* masons, bricklayers, plasterers, carpenters, joiners, decorators, smiths, and plumbers, and to be held at the Merchant Venturers' or other schools, entitling the holders to instruction in classes for the study of such subjects of science or art as are concerned with the principles of their respective industries.—*Bristol Times and Mirror.*

THE ENGLISH IRON TRADE.—The English iron market keeps very quiet, and its tone is the reverse of strong. The demand for pig-iron is comparatively slight, and as the re-lighting of Scotch furnaces has imparted a weakening tendency to the market, both buyers and sellers are undecided, and little business is being done. Cleveland pig-iron has dropped 1s. 6d. a ton, and in Lancashire depression in prices prevails. Bessemer iron has not lost in value, but warrants are cheaper. The fall in pig-iron has, so far, not affected finished iron; in fact, it may be said that it is rather stiffer; but unless trade revives soon, a reaction is inevitable, notwithstanding that manufacturers are handicapped by dear fuel and high wages. The steel market is depressed, and prices, especially in the north-west, are irregular, great competition prevailing for orders. Ship-builders and engineers are slacker.—*Iron.*

LECTURES AT CARPENTERS' HALL.—Reports of the third and fourth of this series of lectures are in type, but are held over until next week for want of space.

STATUE OF DR. WILLIAM CHAMBERS, EDINBURGH.—The bronze statue of William Chambers, LL.D., by Mr. John Rhind, sculptor, erected in front of the Museum of Science and Art, Edinburgh, was unveiled by the Lord Provost on Thursday of last week, in presence of a gathering of city notabilities. It stands upon an ornate pedestal of red Corneme stone, which is decorated with reliefs and bronze. The figure is 10 ft. 6 in. in height, and represents Dr. Chambers attired in court costume, over which is thrown his civic robe. The figure is life-like and picturesque in pose, and looks well in the position which it occupies. The inscription on a bronze panel let into the front of the pedestal reads:—

WILLIAM CHAMBERS,
of Glenormiston, LL.D.,
LORD PROVOST
of Edinburgh,
1865 1869.
Born 16th April, 1800.
Died 21st May, 1883.

THE BUILDINGS OF PEKIN.—A paper on this subject was read before the Cologne Geographical Society at its last meeting by Dr. Emans. The author said that the buildings of Pekin are all of one style of architecture, the only existing Chinese style, known by its steep, concave roof. In many buildings several roofs are superimposed one upon the other, which feature has a striking effect, especially in the towers which rise upon the city walls. The material of all private and most public buildings is a brick of slate colour, the roofs being covered with pantiles of the same tinge. Only Imperial buildings have roofs of yellow, the palaces of Princes and the gate towers of green tiles. Wood is but sparingly used in private houses, being too dear in a country devoid of forests; but it is often lavishly employed in temples and palaces. The private houses have but one story, the only opening towards the street being the door, which imparts a desolate and even sinister look to the labyrinth of irregular lanes packed in between the main thoroughfares. Passing through the door, a courtyard is reached, on one side of which, or round which, the rooms are ranged. The latter have only one door, which also admits the light. Every larger courtyard is planted with trees, which gives to Pekin, looked at from the walls, the appearance of a park enlivened by many coloured roofs. There are no provisions for heating the rooms except the "Kang," an elevation, provided on the inside with a stove, running along one side of the room, which serves the Chinese as bed, and frequently also as table and chairs. The doors are often pasted over with the coloured representations of two tutelar genii, and not seldom one reads above them the pious inscription "Ping An," which means "peace and quietness." The public buildings are very unevenly distributed over the city. Amongst them may be mentioned as worthy of note the imperial palace, consisting of a long series of gates, reception halls, separate palaces, and gardens, the Hill of Prospect, the marble bridge, the Examination Hall, the observatory with its valuable instruments, mostly left behind by the missionaries of the seventeenth century, the Temple of Confucius, the Hall of the Classics, the Drum Tower, and the Bell Tower. To Europeans, the buildings of greatest interest are the embassies and the three Catholic cathedrals, "Nan Tang," "Bé Tang," and "Dung Tang." Round the city are situate temples and Buddhist monasteries.

MEETINGS.

SATURDAY, MARCH 14.

Architectural Association.—Visit to the Tower Bridge Works. Meet at 3 o'clock at the entrance adjacent to the Tower.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." V. 3 p.m.

MONDAY, MARCH 16.

Surveyors' Institution. Mr. Walter Clode on "Some Questions of Law arising out of the Occupation of Houses in Flats" 8 p.m.

Society of Arts (Cantor Lectures).—Professor R. Meldola, F.R.S., on "Photographic Chemistry." II. 8 p.m.

Liverpool Architectural Society.—Special meeting at the Library. 7.30 p.m.

TUESDAY, MARCH 17.

Institution of Civil Engineers.—Further discussion on Mr. J. Thornhill Harrison's paper on "The Subterranean Water in the Chalk Formation of the Upper Thames, and its Relation to the Supply of London." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor A. Bostock Hill on "Trade Nuisances." 8 p.m.

Society of Arts (Foreign and Colonial Section).—Sir Edward N. C. Braddon on "Recent Development of Tasmanian Industries." 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. G. F. Charnock on "Recent Practice in the Design of Ironwork for Buildings" 7.30 p.m.

WEDNESDAY, MARCH 18.

Carpenters' Hall (Free Lectures to Artisans).—Professor Banister Fletcher on "Architecture, and its Civil and Commercial Value 8 p.m.

Society of Arts.—Mr. F. H. Cheesewright on "Harbours, Natural and Artificial." 8 p.m.

Civil and Mechanical Engineers' Society.—Mr. Otto Friederici on "Electrical Appliances." 7 p.m.

British Archæological Association.—(1) Miss Russell on "The Acquisition of Lothian by Northumbria." (2) Dr. Fryer on "The Composition of Roman Mortar." 8 p.m.

Surrey Archæological Society.—Annual General Meeting. 4 p.m.

Institution of Civil Engineers.—Students' Visit to the Goods Depôt of the London, Tilbury, and Southend Railway at Whitechapel.

Royal Meteorological Society.—Paper by Mr. G. J. Symons, F.R.S., entitled "A Contribution to the History of Rain Gauges." 7 p.m.

St. Paul's Ecclesiological Society.—7.30 p.m.

Manchester Architectural Association.—Paper by Mr. Edgar Wood. 7.30 p.m.

THURSDAY, MARCH 19.

Royal Institution.—Professor C. Meymott Tidy on "Modern Chemistry in Relation to Sanitation." III. 3 p.m.

Institution of Mechanical Engineers.—General Meeting, when two papers will be read. 7.30 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, MARCH 20.

Architectural Association.—Special General Meeting, when the new rules as amended by counsel will be submitted for confirmation. 7 p.m. To be followed by an Ordinary Meeting, when two papers will be read (1) Mr. H. V. Lanchester on "Spanish Architecture"; (2) Mr. Horace Townsend on "The House that Jonathan Builds." 7.30 p.m.

Institution of Mechanical Engineers.—General Meeting (continued). 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. A. Wynter Blyth on "Sanitary Law: English, Scotch and Irish." 8 p.m.

SATURDAY, MARCH 21.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." VI.

Edinburgh Architectural Association. — Visit to Gosford House, and Red House.

Glasgow Architectural Association.—Visit to Paisley, Coats Church, &c.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
School Buildings	Llanharran (Glam.) School Board	Not stated	Mar. 31
Bird and Reptile House	Bristol, &c. Zoological Society	do.	May 1
*Labourers' Dwellings	Manchester Corp.	do.	June 1
*Drainage and Sewerage Scheme	Easthampstead R.S.A.	50*.	June 24

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Purchase and Pulling-down Building Mat.	School Bd. for London	*Official*	Mar. 16
Cast-iron Pipes, Valves, &c.	Manchester Corp.	do.	Mar. 17
Hydrants, Castings, Brasswork, &c.	Liverpool Corp.	do.	do.
Sewerage Works	Alt'rincham R.S.A.	Mr. McKenzie	do.
Additions to Prestwich Asylum, Manchester	Committee	H. Littler & Son	do.
Sewering and Paving	Belfast Corporation	*Official*	do.
*Works and Materials	Tottenham Local Bd.	*Official*	do.
*New College	Norwich Training Coll.		do.
*Works and Materials (Eastern District)	War Department	*Official*	Mar. 18
*Works in connexion with Refuse Destructor	Bristol U.S.A.	F. Ashmead	do.
Shop and Offices, Corn Market, Halifax		W. H. D. Horsfall	do.
Seven Scullery Houses and House and Shop, Ovenden, Halifax	Proprietor		do.
Shop and Dwelling-house, Bovey, Tracey	Mr. Peters	S. Segar	do.
Re-building "Bronsh Arms" Inn, Cardiff	Jas. Howell	J. P. Jones	do.
Alterations and Additions to Schools	Rumney School Board	do.	do.
Cast-iron Water Pipes, Sluice Valves, Hydrants, &c.	Tynemouth R.S.A.	A. S. Dinning	do.
Sewerage Works, Dudley and Ambleford	do.	do.	do.
*Works and Materials	Kingston Highway Bd.	A. J. Henderson	do.
Sewerage &c. Shanklin	Isle of Wight R.S.A.	*Official*	do.
Timber, Rails, Posts, &c.	N. E. Ry. Co.	do.	do.
Ten Workmen's Cottages, Old Radnor	Sir H. E. F. Lewis, Bt.		do.
Wesleyan Chapel, Schools, &c. Masham, Yorks	Rev. J. Tesseyman	Edwd. Taylor	do.
Bridge over Railway, Dowlais	G. W. & Rhymney Rail. Cos.	*Official*	Mar. 19
*Making up Roads, &c.	Ealing Local Board	Chas. Jones	do.
New Church, Rosset Denbighshire		Dowglas & Fordham	do.
Iron Castings, Gas Works	Halifax Corporation	T. Holgate	do.
Two Villas, Lumpster		D. Jenkins	do.
*Laying out Cemetery	Sutton-in-Ashfield, B.	Mr. Wm. Bishop	do.
Road to Argoed	Tredegar Local Board	G. A. Lundie	Mar. 20
Two Semi-detached Houses, Halifax		Utley & Gray	do.
New Free Church Crumdale, N.B.		Geo. Sutherland	do.
Work at Cemetery	Hedworth, Monkton, & Jarrow Burial Bd.	*Official*	do.
	Hornsey Local Board	T. de Courcy Meade	do.
*Sewerage and Road Works	do.	do.	do.
*Building Works		Sir T. Deane & Son	do.
Church House, Clyde-road, Dublin		Ross & Macbeth	do.
Parsonage, Dufftown, N.B.	Rev. Mr. Mozaridge	W. J. Davis	Mar. 21
Dog Stone	Leominster High. Bd.	Matthews & Mackenzie	do.
House and Shipping, Keith, N.B.		A. W. Parry	do.
*Works and Materials	Reading Corporation		do.
Road Works	Hawarden and Hope Highway Board	W. Newton	do.
*Wood Paving	Wandsworth Bd. of Wks	J. C. Radford	Mar. 23
*Repairs of Private Roads	Croydon Council	*Official*	do.
Road Works	Methley Local Board	do.	do.
Road Works	Hillsborough Lnd Soc.	J. H. Robertson	Mar. 24
*Making-up Roads and Paving Footways	Willesden Local Bd.	O. Claude Robson	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Wesleyan Chapel and Schools	Trustees of Garrison and Naval Port of Chatham	Rusk & Smith	Mar.
Iron, Fittings, Wire, &c.	Manchester, Sheffield, and Lincolnshire Ry. Co.	*Official*	do.
Iron Pipes and Castings	Swansea Town Council	do.	do.
*Guernsey Granite	Gravesend U.S.A.	do.	do.
*York Paving and Granite Kerb Stone	St. Saviour's Bd. of Wks	do.	do.
*Works and Materials (Birmingham)	War Department	do.	Mar.
*Underground Convenience	St. Martins-in-the-Fields Vestry	C. Mason	do.
*Works and Materials (South Wales)	War Department	*Official*	do.
*Barge-away Dust, Ashes, Refuse, &c.	Hammersmith Vestry	H. Mair	do.
Forty Cottages, Tredegar	New Building Soc.		do.
Main Sewer, Dosgh, Ireland	Antrim R.S.A.	*Official*	Mar.
Sewerage Works (15,396 yards)	Auckland U.R.S.A.	G. Johnston	do.
*Widening Road	Horbury Local Board	H. P. Dawson	do.
Granite and Whinstone Road Metal	Pontefract Corp.	J. Hewetthe	Mar.
New Road, Penrhiwceiber	Mountain Ash Loc. Bd	*Official*	do.
*Works and Materials (York)	War Department	do.	April
Heating Chapels	Brightside Burial Bd.	do.	do.
*Sewerage Works	East Grinstead R.S.A.	Urban Smith	do.
*Works and Materials (Liverpool Sub-District)	War Department	*Official*	April
New Cemetery	Houghton-le-Spring Local Board	Thos. Foster	April
School and Offices, Heatherland	Kinson School Board	Lawson & Donkin	April
[Raising Building and Constructing Concrete Floor and Roof	Sheffield United Gas Light Co.	F. W. Stevenson	do.
*Cemetery, Chapel, Lodge, &c. &c.	Melton Mowbray L. B.	*Official*	April
*Dock Gates, Tyne Dock	Nat. Ry. Co.	J. W. Barry	April
Increasing Height of Chimney, Canal Mills, Bowerby Bridge	Thos. Gaukroger		No da
Additions to School, Gilbert-street and Lord-street	Sheffield School Board	C. J. Innocent	do.
House, Business Premises, and Warehouse, Holbeach	Mrs. Harrison	J. Sawyer	do.
*Drain Pipes	Hertfordshire C. C.	Urban Smith	do.
*Works and Materials (Devon Sub-Dist.)	War Department	*Official*	do.
*Erection of Goods Office and Cottages	W. R. Co.	do.	do.
Home for Incurables	Newcastle-on-Tyne Crp	E. Shewbrooks	do.
Five Houses and Shops, Newton-grove, Leeds		A. Neill	do.
Re-building "Alexandra Inn," Newport, Mon.	Hancock & Co Ltd.	Habershon & Fawckner	do.
Re-building "Shakespeare Inn," Tyne Dock	Newcastle Breweries, Ltd.	S. Oswald & Son	do.
Alterations to "Lord Nelson," &c. Jarrow	John Duncan	B. F. Simpson	do.
Two Houses, Townsley Building Estate, Stanley, Durham	Jas Craine	T. C. Nicholson	do.
Workmen's Houses, Tarbrax, Cobbinshaw, N.B.	Caledonian Mineral Oil Co.		do.
Alterations to South Ridge House, Beaston Hill, Leeds		C. H. Thornton	do.
Church Work at Lanuton-on-the-Hill and Hemingby, near Horncastle		Wm. Scorer	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Surveyor's Assistant	West Bromwich Corp.	100*.	Mar.
*Road Foreman	Birmingham Corporation	2*.	Mar.
*Inspectors (2) of Sanitary Works	Commissrs. of Sewers	100*. &c. each	April

Those marked with an Asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xx.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

1,176.—Cementing Compound: *W. Sinclair and M Mackay.*—This invention relates to the combination of certain ingredients for the manufacture of cement specially adapted for cementing stone to stone, iron to stone, or for filling in the seams of iron ships, joints of drain pipes, &c. Resin, wax, plaster of Paris, iron filings, and graphite are used in certain variable proportions for the different purposes indicated.

2,789.—Grates: *H. J. Wilson.*—According to this invention, a framework of bars is placed in the grate, hooking on to the back part. By such arrangement, air is admitted all round the burning fuel, and combustion facilitated.

3,343.—Brick and Pottery Kilns: *T. Fletcher and others.*—The improvements which are the subject of this patent consist of arrangements whereby the products of combustion are led into a combustion chamber, thence, by means of a series of flues and dampers, into the chimney of the kiln, or, in alternative, into a flue, from which other kilns can be supplied, so as to make use of the gases for a second (or even a third) kiln.

4,458.—Sliding Sash Windows: *G. Le Maistre.*—In sliding sashes made in accordance with this invention, into each stile or side of the sash frame is fitted a cast-iron or metal block, held by a metal plate screwed in position, and runners or rollers. This plate is drawn in or pressed outward by the action of a thumb screw, so that while the sash is capable of free sliding movement, it can be suspended at any convenient height.

4,712.—Sewer-pipes: *H. L. Doulton.*—The pipes which are the subject of this patent are made mainly of a coarse and porous substance, corrugated or fluted so as to cause the cohesion of an impervious lining of inner tubing.

14,975.—Chimney-pots: *F. J. Orwin.*—This patent refers to what is called the "Dice-box Chimney-pot," and takes its name from an appliance of that shape fitted to the top of the pot, the sides of which serve to deflect the wind and prevent down-draught.

NEW APPLICATIONS FOR PATENTS.

February 23.—3,237, M. Pickett and T. Collins, Rotary Sash Centre Fittings and Fixings.

February 24.—3,276, R. Whitaker, Wood and other Screws.—3,293, J. Prentice and others, Door-handles.—3,300, B. Sand A. Cocks, Flushing by Syphonage. 3,312, F. Bywater, Rollers or Wheels applied to Planes for planing wood, &c.—3,326, A. Pochin, Roadways, Pavements, &c.—3,351, R. Coursen, Plaster Slabs.—3,353, A. Trancombe, Slow Combustion Fire-stoves.—3,369, W. Moore, Water-closets.

February 25.—3,408, F. Wright and F. Woolstone, Disinfecting the Pan, Traps, and Drains of Water-closets.—3,419, W. Munns, Scroll Sawing-machine.—3,441. F. Smith, Cap or Terminal for Ventilators.

February 26.—3,457, W. and E. Bracewell, Flooring Cramp.—3,458, C. Spinks, Trapper Plane for turning wood from the square. 3,459, J. Hamilton, Fire-grates.—3,528, J. Manwell, Piles and Pile-driving.

February 27.—3,550, W. Barns and J. Cockburn, Wheelbarrows.—3,555, W. Thompson, Concrete-mixing Machines. 3,558, J. Barlow, Glazing.—3,580, T. Hellwell, Glazing Tar or Astragal.—3,595. W. Holbrook, Draught-preventer for doors.—3,602, H. & A. Denton, Bolts for Doors and Gates.—3,610, A. Steele and W. Cunningham, Jun., Stoves or Fire-grates.—3,616, W. and E. Lawrence, Portable Ceiling for Temporary Structures.

February 28.—3,637, T. Brown, Ventilators for House-drains.

PROVISIONAL SPECIFICATIONS ACCEPTED.

18,139, W. Adamson, Ventilating and Damp-resisting Brick.—18,667, H. Helland and J. Kaufmann, Scaffolding.—20,808, J. Biggs and J. Allen, Flushing Cisterns.—538, E. & E. Kerry, Burglar Cheater and Draught Excluder.—591, E. Goupel, Construction of Houses.—599. A. Boult, Draught Excluders.—813, T. Ure, Sanitary Apparatus for Water Closets, &c.—1,095, F. Jackson, Stoves and Fireplaces.—1,213, R. Pope and W. May, Sash-cord Fastener.—1,367, R. Cosbett, Flush Cisterns, &c.—1,435, W. Bodin, Flushing Apparatus.—1,449, A. Ward, Fireproof Floors, &c. 1,469, E. Leon, Water-closets.—1,553, W. Jackson, Decorated Door-panels.—2,647, A. Lawrence, Moulding Artificial Stone Paving Slabs.—2,634, D. White, "Filler" used in French Polishing.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

6,265 C. Orr, Door-closing Apparatus.—12,508, F. Pescetto, Flushing Apparatus.—17,668, J. Clarkson, Sash-pulleys for Windows.—19,966, J. Wallace, Boilers of Kitchen Ranges.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 2.—By *Walter Hall*: 15, Bury-st., Bloomsbury, u.t. 46 yrs. g.r. 9*l*., r. 192*l*., 1,340*l*.; 17, Bury-st., u.t. 72 yrs., g.r. 16*l*., r. 182*l*., 1,400*l*.; 9, Sherriff-rd., West Hampstead, f., 970*l*.; 1, Morris-rd., Poplar, f., r. 32*l*., 390; 2 to 8, Morris-rd., f. r. 117*l*., 1,110*l*.; f. house and wheelwright's shop in rear, r. 40*l*., 505*l*.; the goodwill of 73, Theobald's-rd., Holborn, u.t. 21 yrs., 150*l*.

March 3.—By *H. J. Bromley:* 1 to 8, Bell-green, Sydenham, u.t. 11 yrs., g.r. 8*l*., r. 124*l*., 365*l*.—By *Jones, Lang, & Co.*: No. 111, Newington Butts, f., area 3,000 ft., 1,100*l*.—By *Chesterton & Sons*: 48 and 50, Hampden-st., Paddington, u.t. 58 yrs., g.r. 10*l*., 550*l*.

March 4. -By *T. B. Westacott*: l.g.r. of 30*l*., u.t. 33 yrs., g.r. 10*l*., Camden Town, 300*l*.; l.g.r. of 63*l*., u.t. 76 yrs., g.r. 11*l*., Uxbridge-rd., 1,020*l*.; 197, Junction-rd., Upper Holloway, u.t. 65 yrs., g.r. 4*l*., 400*l*.—By *J. Bott*: 36 to 42 even, Kender-st., New Cross, f., r. 124*l*. 16s., 1,350*l*.

March 5.—By *Gough & Dove*: 47, Osnaburgh-street, Regent's Pk., u.t. 32 yrs., g.r. 10*l*., r. 65*l*., 530*l*.; 27, High-st., Camden Town, u.t. 30 yrs., g.r. 30*l*., r. 90*l*., 520*l*.; 71, High-st., u.t. 7¾ yrs., g.r. 40*l*., r. 94*l*., 200*l*.—By *Beadel & Co.*: The f. residence, "Upton House," Watford, and 7a. Or. 19p., 6,500*l*.—By *Newbon & Co.*: f. house and shop, High-rd., Clapton, r. 60*l*. p.a., 1,570*l*.; 10, Kildare-gardens, Bayswater, u.t. 60 yrs., g.r. 50*l*., 1,000*l*.; 100, Star-st., Edgware-rd., u.t. 30 yrs., g.r. 6*l*. 6s., r. 50*l*. 8s., 565*l*.—By *H. E. Trafford*: 32, Bromley-st., Stepney, u.t. 18 yrs., g.r. 24., 190*l*.; 8, 9, and 10, First Avenue-rd., Leytonstone, u.t. 76 yrs., g.r. 7*l*. 10., 210*l*.—By *Messrs. Cronk*: 26, Cumberland-ter., Regent's Pk., u.t. 34 yrs., g.r. 42*l*., 1,280*l*.

March 6.—By *Randall, Beard & Baker*: 9 to 17[illegible] Trinity-rd., Finchley, and a plot of land, f., 1,150*l*.; and 32, Elsham-rd., Kensington, u.t. 53 yrs., g.r. 7*l*., 375*l*.

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	6/10/0 7/15/0
Teak, E.I. load		8/10/0 14/0/0
Sequoia, U.S. ft.cu.		2/3 3/0
Ash, Canada load		2/10/0 4/5/0
Birch, do.		2/5/0 4/5/0
Elm, do.		3/10/0 4/15/0
Fir, Dantzic, &c.		2/0/0 2/15/0
Oak, do.		2/10/0 4/10/0
Canada		4/17/6 6/10/0
Pine, Canada red		2/10/0 3/10/0
Do. yellow		2/0/0 3/10/0
Lath, Dntch, c. f. th		5 0 0 6 0 0
St. Petersburg		5/0/0 7/0/0
Deals, Finland, 2nd & 1st std	100	7/0/0 10/0/0
Do. 4th & 3rd		7/0/0 8/0/0
Do. Riga		6/0/0 7/10/0
St. Petersburg, 1st yellow		9/0/0 14/0/0
Do. 2nd yellow		8/0/0 9/0/0
Do. white		6/10/0 10/0/0
Swedish		6/10/0 15/0/0
White Sea		8/0/0 16.10.0
Canada, Pine 1st		13/0/0 24/0/0
Do. do. 2nd		9/0/0 16/10/0
Do. do. 3rd, &c.		6/10/0 10/10/0
Do. Spruce, 1st		8/10/0 10/10/0
Do. do. 3rd & 2nd		6/0/0 7/10/0
New Brunswick		5/0/0 7/0/0
Battens, all kinds		3/10/0 15/10/0
Flooring Boards, sq. in. prep.		1/6 2/6
1st		0/10/0 0/14/0
Do. 2nd		0/9/0 0/10/6
Do. 3rd, Battles		0/7/6 0/8/6
Cedar, Cuba, ft.		/4 /4½
Honduras, &c.		/4 /4½
Mahogany, Cuba		/4½ /6½
St. Domingo, cargo av		/4½ /6½
Mexican do. do		/4½ /5½
Tobasco do. do		/3½ /7
Honduras do.		/5½ /6½
Box, Turkey	ton	4/0/0 13/0/0
Rose, Rio		10/0/0 20/0/0
Bahia		5/0/0 18/0/0

TIMBER (*continued*).		
Satin, St. Domingo	ton	0/0/10 0/
Porto Rico		0/0/9 0/
Walnut, Italian		0/0/3½ 0/
METALS.		
Iron—Bar, Welsh, in London	ton	6.5.0 6/1
Do. do. at works in Wales		5/15/0 6/
Do. Staffordshire, in London		6/0/0 7/
Copper—British, cake and ingot		56/0/0 57
Best selected		59/0/0 60/
Sheets, strong		66/0/0 0/
Chili, bars		52/10/0 0
Yellow Metal		0/0/8 0/0
Lead — Pig, Spanish	ton	12/10/0 0/
English, com. brands		12/11/3 12/1
Sheet, English, 3 lbs. per sq. ft. and upwards		14/5/0 0/
Pipe		14/15/0 0
Zinc — English sheet	ton	27/3/0 0/
Vieille Montagne		27/3/0 0/
Tin—Straits		90/10/0 0/
Australian		89/15/0 0/
English Ingots		94/10/0 0/
OILS.		
Linseed	ton	21/12/6 22/
Cocoanut, Cochin		36/0/0 0/
Do. Ceylon		28/10/0 29/
Palm, Lagos		25/10/0 0/
Rapeseed, English pale		29/5/0 29/1
Do. brown		28/0/0 0/
Cottonseed ref.		19/10/0 0/
Oleine		21/15/0 24/
Lubricating, U.S.		6/0/0 7/
Do. refined		7/10/0 12/
Tar—Stockholm	barrel	1/3/6 1/
Archangel		0/14/6 0/

TENDERS.

Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays*.]

BEDARE JUNCTION.—For the erection of fifty houses, for the Aberdare Building Club. Mr. Arthur O. Evans, architect, Hall, Pontypridd :—

	No. 1 House.	No. 2 House.
Powell	£177 0 0 each	£189 15 0 each
Lewis & Sons	138 0 0 ,,	153 0 0 ,,
Lewis, Nelson, Treharris,		
&c.	139 0 0 ,,	149 0 0 ,,
Pope & C., East Grinstead	126 0 0 ,,	139 0 0 ,,

BERRY (Glamorganshire).—For the erection of fifty-seven houses and two shops in Park-crescent and Gam-street, for the Park (Barry) Building Company, Limited. Mr. W. H. Dashwood Caple, architect, 1, St. John's-square, Cardiff. Quantities by the architect.

Stephens, Bastow, & Co.	£26,798 0 0
C. C. Jones & Co.	25,487 0 0
Read, Blight, & Co., Limited	24,489 0 0
Jenkins & Arnold	24,440 10 0
Alfred Elliott	20,614 0 0
David Davies	20,140 0 0
J. Shepherd & Son, Cardiff (accepted)	19,990 0 0

BOURNEMOUTH.—For new engine and boiler-houses in connection with the sea-water scheme, contract No. 4, for the Bournemouth Town Council. Mr. F. W. Lacey, Borough Engineer and Surveyor :—

Lucas	£1,018 | Jos. White, Bournemouth* .. £375

* Accepted.

BOURNEMOUTH.—For store under Bournemouth Pier (west end), for the Bournemouth Town Council. Mr. F. W. Lacey, Borough Engineer and Surveyor :—

Jos. White	£275 0 0
Hoare & Son, Bournemouth (accepted)	178 10 0

BRISTOL.—For the construction of sewers, in Soundwell and Staple-road, St. George, Bristol, for the St. George Urban Sanitary Authority. Mr. T. L. Lewis, C.E., Engineer and Surveyor, Parochial Offices, St. George, Bristol :—

Hamlin	£335 0 | I. Britton, St. George* .. £151 0
Parsons	2 0 0 * Accepted.

Engineer's estimate, £230. 16s. 4d.

BRSLEDON (Hants).—For alterations and additions to "The Inn," Bursledon, for Messrs. Strong & Co. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton :—

W. H. Chapman	£188 0 0
Stevens & Co., Southampton (accepted)	178 0 0

BURTON-UPON-TRENT.—For the erection of a retort house, &c., at the gas works, for the Town Council. Mr. F. L. Rimmington, engineer, Gas Works, Burton-upon-Trent :—

John Arlow	£2,093 13 0
Hadden & Son	1 [illegible] 0 ,,
Chamberlain Brothers	1,598 18 4
Bywillcock, Walverhampton (accepted)	1,468 15 7
Walker & Son	1,447 18 6
Geo. Hodges, Burton-on-Trent (withdrawn)	1,317 13 6

CHERTSEY.—For additions and alterations to Pyrcroft House, Chertsey, Surrey, for Mr. E. Williams Snell. Mr. Edgar H. Selby, architect, 26, Craven-street, Strand, W.C. :—

G. Nesmyth, Chertsey (accepted)	£245 0 0

CHISLEHURST.—For the erection of workmen's cottages, Chislehurst, Kent, for Mr. Enos Cornelius. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton :—

Stephens, Bastow, & Co.	£3,294 | Hammerton & White £2,843
Perry & Co.	3,120 | F. H. Klugerlee, Oxford* 2,741
Light & Co.	2,916 | * Accepted.

CHISLEHURST.—For the erection of workmen's Institute and Club House, for the use of the employés of the Lond on & South-Western Railway Company. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton :—

Thomas Nichols, Southampton accepted)	£2,700 0 0

CLEVELAND.—For the erection of a warehouse and other premises at Thornton Mills, for Mr. James Cliason. Messrs. Horsfall & Williams, architects, Halifax :—

Cliason, Geo. Readyough, Elland	£979 0 0
Crowther, J. E. Crowther, Elland	936 10 0
Lumber, Joseph Aspinall, Elland	88 0 0
Calder, Rushworth & Firth, New Bank, Halifax	86 10 0
Ironfounder, James Mackrell, Elland	23 17 0

GLOUCESTER.—For re-building No. 16, Eastgate (exclusive of ironmongery, ironwork, and terra-cotta), for Messrs. H. T. Gould & Co. Mr. J. Fletcher Trew, architect, 12, Clarence-street, Gloucester :—

Gould	£438 | Freeman & Jones £434
Cook & Son	446 | E. Clutterbuck, Gloucester* 380

* Accepted.

GREENWICH.—For re-building the "King's Arms," King William-street, Mr. G. G. Tucker, architect :—

Lawrance	£2,304 | Robson £2,169
Bloss	2,220 | Heywood 2,149
Bowyer	2,191 | Holloway 2,143
Hall	2,177 | Godfrey 2,097

HEREFORD.—For additions to the New Weir Lodge, near Hereford, for the Hon. Mrs. Griffiths. Mr. G. H. Goodsell, architect, Broadgates, Hereford, and Andrews & Son ..... £170 James Lloyd, Hereford* £120

* Accepted.

HOLYWELL (Flint).—For the construction of a farmhouse and buildings, for the Chester Municipal Charities' Trustees. Messrs. John Cooper & Son, architects and surveyors, Pepper-street, Chester, quantities supplied :—

Bleakley & Sons	£1,290 0 0 | E. O. Probert £981 14 4
Jones & Son	1,155 3 4 | I. & F. Kitchen 897 0 0
Davies	998 7 0 | H. Sumpter 838 0 0
Owen	996 6 0 | T. Williams & Co.,
Owen	980 0 0 | Buckley, Flints* .. 830 0 0

* Provisionally accepted, subject to the approval of the Charity Commissioners.

HORTON (Dorset).—For additions to the board school, for the Horton School Board. Mr. H. F. J. Barnes, architect, Poole :—

Hall (too late)	£315 16 0 | G. Baker, Wimborne* .. £254 0 0
Saunders	272 10 0 | * Accepted.

HOUNDS.—Accepted for the erection of a detached house and lodge at Armley. Mr. C. H. Thornton, architect, 3, Park-row, Leeds :—

Brick and Stone Work.—James Binns, Woodhouse.
Joiner.—Geo. Abbott, Armley.
Slaters.—Watson & Wortley, Leeds.
Plumbers.—J. W. Hunsley & Son, Leeds,
Plasterers.—Brown & Brook, Armley.
Total, 790.

LONDON.—For making up certain roads in Fulham, viz., Lillie-road, Secs. III., IV., and V., Normand-road, Sec. I., Biscay-road Sec. II., and Comeragh-road, Sec. II., for the Vestry of Fulham. Mr. W. Sykes, New Streets Surveyor

	Lillie-road (III.)				Lillie-road (IV.)				Lillie-road (V.)				Normand-road, Sec. I.				Biscay-road, Sec. II.				Comeragh-road, Sec. II.			
	R.	Y.	V.	I.	R.	Y.	V.	I.	R.	Y.	V.	I.	R.	Y.	V.	I.	R.	Y.	V.	I.	R.	Y.	V.	I.
Nowell & Robson	387	144	126	112	229	168	144	102	398	343	384	342	110	99	85	74	398	322	342	310	110	91	84	78
Towers & Wimpey	465	159	162	119	264	175	150	110	600	462	460	355	115	103	89	78	840	435	375	351	465	94	87	81
G. Bell	439	172	151	127	260	200	164	137	503	442	364	349	129	104	86	82	708	439	364	340	172	125	114	112
H. J. Greenham	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	740	380	331	305	98	89	82	76
Imperial Stone Co.	—	—	—	134	—	—	—	166	—	—	—	239	—	—	—	103	—	—	—	418	—	—	—	182
Patent Victoria Stone Co.	—	—	8d. per ft.	—	—	—	8d. per ft.	—	—	—	8d. per ft.	—	—	—	8d. per ft.	—	—	—	8d. per ft.	—	—	—	8d. per ft.	—

R.—All work except the actual paving.
Y.—York Stone paving.
V.—Victoria Stone paving.
I.—Imperial Stone paving.

LEYTON.—For the erection of "Ruckholts" schools, for 1,361 children, for the Leyton School Board. Messrs. J. T. Newman & Jacques, Architects to the Board. Quantities by Messrs. R. L. Curtis & Son :—

Holland	£15,386
Scott	15,122
Catley	15,019
Read	14,793
Morter	£14,526
Coxhead	14,341
Oregan*	14,249

* Accepted subject to the approval of the Education Department.

LEYTON.—For paving playgrounds at the Mayville-road Schools, for the Leyton School Board. Messrs. J. T. Newman & Jacques, 2, Fen-court, E.C., Architects to the Board :—

Concrete Paving.

Patent Victoria Stone Co.	£934 | Bradford & Hancock 740

Asphalte.

Lawford & Co.	£1,816 | Grindley & Co. £690
Lawford & Co. (alternative)	889

Tar Paving.

Jackson	£690 | Lawford & Co. £570
Grindley & Co.	599 | Hobman & Co. (accepted) .. 459

LONDON.—For escape staircases at the infirmary, St. John's Hill, New Wandsworth, for the Guardians. Mr. Thos. W. Aldwinckle, architect, 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied :—

J. F. Cake & Sons	£1,950
St. Pancras Ironwork Co.	1,748
Baker	1,477
H. Young & Co.	1,378
J. Stone	1,298
T. Potter & Sons	1,233
W. Johnson	£1,190
C. Smith & Sons	1,187
R. G. Battley	1,097
Ceres Iron Works	1,009
R. Crane	1,300
J. Mills	1,284

LONDON.—For laying about 245 ft. of 12-in. pipe sewer, 482 ft. of 18-in. pipe sewer, and 554 ft. of 18-in. pipe sewer, in Crabtree-lane, for the Vestry of the parish of Fulham. Mr. James P. Norrington, Surveyor :—

Thos. Adams	£937 | R. Mullett £785
J. H. Neave	848 | G. Bell 779
Henry Lee	797 | J. Mears 777

LONDON.—For the re-erection of No. 206, Mile End-road, E., for Mr. W. H. P. Banks. Messrs. Hounsell & Lambert, architects and surveyors, 59, Bishopsgate-street, E.C. :—

Charles Cox	£1,987 | Ashby & Horner £1,783
J. Hearle & Son	1,880 | F. & F. J. Wood 1,736

LONDON.—For additions, &c., to premises, No. 30, High street Hampstead, for Mr. Edward Elliott. Mr. Albert E. Fridmore, architect, 3, Broad-street-buildings, E.C. :—

Burford & Son	£327 | W. J. Wiltshire £472
Burman & Sons	526 | Taylor & son 443
W. Evans	501 | King & Co. 404

LONDON.—For the erection of the Avenue Strict Baptist Chapel, Prentice-street, Camden Town. Mr. Robt. Beale, architect, 9, Victoria-street, S.W. :—

Gould & Brand	£1,783 | P. Hart (too late) £1,582
Scrivener & Co.	1,725 | C. E. Skinner* 1,589
E. Toms	1,634

* Accepted subject to 83l. deduction for heating.

LONDON.—For sanitary and decorative renewals and repairs at South Kensington, under the direction of Messrs. Morley & Letts, surveyors, 185, Earl's Court-road, S.W. :—

31, Penywern-road.—James Whitaker, Earl's Court-road £166
41, Penywern-road.—Barlow & Roberts, Aldermanbury 139
57 and 64, Nevern-square.—James Rugg, Earl's Court-road 48
206, Earl's Court-road.—James Whitaker, Earl's Court-road 192
8, Penywern-road.—F. Holdstock, Richmond-road 170

LONDON.—For alterations to studio at 20, Upper Baker-street, Marylebone, for Mr. Alfred Ellis. Mr. T. Durrans, architect :—

G. Head & Co.	£180 | H. C. Clifton £150
J. Edgar	167

LONDON.—For alterations at the "Black Horse," Haymarket, for Mr. W. Freeman Thomas. Mr. Edward Clark, architect, 47, Strand W.C. Quantities by the architect :—

T. L. Green	£415 | J. Anley £337
Patman & Fotheringham	397 | Whitehead & Co.* 305
Wilkinson Bros	396 | * Accepted

LONDON.—For alterations and additions at "The Bull's Head," Wood-street, Cheapside, E.C., for Mr. James Page Geary. Mr. Edward Clark, architect, 47, Strand, W.C. Quantities supplied by the architect :—

G. M. Taylor	£920 | J. Anley £766
T. L. Green	793 | Whitehead & Co.* 693

* Amended and accepted.

LONDON.—For alterations and decorations at "The Royal Standard," Pimlico, S.W., for Mr. Richard Wake. Mr. Edward Clark, architect, 47, Strand, W.C. Quantities supplied by the architect :—

Burman & Sons	£523 | Whitehead & Co. £450
J. Anley	490 | T. L. Green (accepted) 449

LONDON.—For alterations and additions at No. 85, Arlington-street, New North-road N., for Messrs. Baxters & Co. Mr. Edward Clark, architect, 47, Strand, W.C. Quantities by the architect :—

J. Anley (accepted)	£507 0 0

[No competition.]

LONDON.—For alterations and additions to "The South London Palace," London-road, S.E., for Mrs. J. J. Poole. Mr. Edward Clark, architect, 47, Strand, W.C. Quantities supplied by the architect :—

T. L. Green	£2,993 | J. Anley £2,899
Holliday & Greenwood	2,959 | Patman & Fotheringham .. 2,883
Gould & Brand	2,949 | Whitehead & Co. 2 790
E. Toms	2,839

LONDON.—For rebuilding "The Salisbury Tavern," Nos. 91 and 92, Strand, W.C., for Messrs. Geary & Sparks. Mr. Edward Clark, architect, 47, Strand, W.C. Quantities by Messrs. New & Son, 62, George-street, Portman-square, W. :—

G. Ansell	£5,425 | J. Anley £5,026
Brass & Son	5,369 | T. L. Green 4,983
Patman & Fotheringham	5,373 | Whitehead & Co. 4,720
Holliday & Greenwood	5,249

LONDON.—For making up and paving Caroline-place, Delaford-street, and Claybrooke-road, Sec. II., for the Vestry of Fulham. Mr. W. Sykes, New Streets Surveyor :—

	Caroline-place.			Delaford-street.			Claybrooke-road, Sec. II.			
	Y.	V.	I.	R.	Y.	V.	I.	R.	Y.	V.	I.
Victoria Stone Co.	—	330	—	—	—	282	—	—	—	150	—
Imperial Stone Co.	—	—	439	—	—	—	367	—	—	—	198
Nowell & Robson	580	—	504	748	322	—	342	335	170	—	148
T. Adams	615	584	541	696	357	314	283	315	179	167	141
G. Bell	625	535	545	761	385	339	323	385	188	164	157

R.—All work except the footway paving.
Y.—York Stone paving.
V.—Victoria Stone paving.
I.—Imperial Stone paving.

LONDON.—For alterations and additions to "The Stamford Arms," Stamford-street, S.E., for Mr. W. Field. Mr. Edward Clark, architect, 47, Strand, W.C. Quantities by the architect :—

Patrick & Son	£1,547
J. Anley	1,328
T. L. Green	1,257
Spencer & Co.	£1,260
Whitehead & Co.	1,255
J. Mills	1,217

LOXFORD (Essex).—For taking down and rebuilding bridge for the Essex County Council. Mr. Percy J. Sheldon, Engineer, Malmesbury House South Woodford. Quantities by Mr. George Lamb, surveyor, Barking :—

W. R. Parker & Co.	£993 4 10
George Double	990 8 0
John J. Robson	984 19 3
Arthur & Co.	941 0 0
Holme & King	871 9 0
W. French	850 0 0
Archi. Ansell	£836 13 0
Frank Johnson	822 11 11
R. Stroud	733 10 3
Smith	701 0 0
W. Watachi, Ilford, E.*	690 0 0
George Bell	669 0 0

* Accepted.

LYMINGTON.—For rebuilding the "Crown and Anchor" public-house, Lymington, Hants, for Messrs. Stone & Co. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton :—

W. R. & C. Light	£950 | H. Stevens & Co. .. £805
P. Reeks	934 | A. Wheeler, Lymington* .. 854
Thos. Rashley	886 | * Accepted.

MONTGOMERYSHIRE.—For alterations and additions to "Caerhowel," near Montgomery Station, for Colonel Harrison; and for new house at Llanfair Caereinion, in the county of Montgomery, for Dr. Humphreys. Mr. W. H. Spaull, architect, Oswestry :—

Tudor	£3,845 | Lanfair.
Stephens, Bastow, & Co.	3,440 | £1,750
Jno. Evans	3,295 | 1,575
W. Rowdler	3,201 | —
A. Watkin	2,971 | 1,500
W. H. Thomas	2,760 | 1,670

* Accepted. † Lanfair estimate to be reduced.

NENAGH (Ireland).—For works in connection with the water-supply of the town (contracts 1 and 2), for the Guardians. Messrs. R. Gill & Son, 30, Castle-street, Nenagh, co. Tipperary :—

W. Williams	£8,941 0 0
Cunningham	8,878 19 8
Pursell	6,864 0 0
Long	6,781 19 0
Simpson	6,697 11 0
Dixon	£6,566 0 0
E. Finn	6,750 0 0
Driscoll, Glyn, co. Limerick*	5,484 0 0

* Accepted conditionally.

NORTHFLEET.—For building a chimney 150 ft. in height, for the Medway Patents White Lead Company, Limited :—

G. Dickenson	£1,650 0 0
A. Philby	1,539 0 0
C. Chamberton	1,278 0 0
W. Neil, Turner-road, Burdett-road*	£1,038 0 0
G. E. Tournay	953 17 0
Smith & Sons	851 18 6

* Accepted. † Withdrawn.

POTTER'S BAR.—For proposed billiard-room, "Heronfield," Potter's Bar, for Mr. D. Wallace. Messrs. W. G. Habershon & Fawckner, architects, 38, Bloomsbury-square, W.C. :—

Gregar	£874
Glimpson	866
Kinninmont & Son	834
Rodwell	798
Triggs	777
Maides & Harper	£773
Bentley	764
Worboys	708
Wallace	665

RICHMOND (Surrey).—For additions to the laundry at the Richmond Workhouse, for the Richmond Board of Guardians. Quantities by Mr. Ed. Maynard, architect and surveyor, Richmond :—

Hill	£445 | Sweet & Loder £424
Reynolds & Co.	345 | Hunt 333
Jarvis	323 | Eldridge, Richmond* 288
Soole & Son	324 | * Accepted

For Wrought-iron Work to Ditto.

Reynolds & Co.	£112 10 0
Summersales, Keighley, Yorks (accepted)	95 0 0

[Surveyor's estimate for the whole, £400].

SHANGHAI (China).—For the supply of 12,500 tons of broken Soochow granite, 2,000 tons of sand, and 2,000 tons of broken bricks, delivered at the depôts of the Shanghai Municipal Council. Mr. Charles Mayne, Municipal Surveyor :—

	Broken Bricks Per ton.	Large Granite. Per ton.	Ordinary Granite. Per ton.	Fine Granite. Per ton.	Sand. Per ton.
	s. d.	s. d.	s. d.	s. d.	s. d.
Yah Kee & Co.	1 10½	3 0½	4 2½	4 10½	2 8½
Jos & Ming Kee	2 1½	3 0½	3 10	4 10½	3 8½
Chee Tsun Yeang	1 10½	—	4 1½	4 9	3 8½
Sai Ying Dong	1 10½	3 0½	3 11½	4 7	3 5½
Ming Kee	1 7½*	2 4*	3 8½*	4 5½*	3 5*

* Accepted.

[The Municipal Surveyor, in sending us these particulars, says "The granite is of very good quality, and compares favourably with the home granites used for similar purposes."]

SOUTHAMPTON.—For fittings to the Southampton Branch of the Wilts and Dorset Bank. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton :—

D. W. Lewis, Swindon (accepted)	£392 15 0

SOUTHAMPTON. For the conversion of a private house, No. 23, Waterloo-place, Southampton, into shop and business premises for Mr William Dibben (labour only). Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton:—

Morgan, Isted, & Morgan	£160 0 0
A. Warden (accepted)	140 0 0

SOUTHEND (Essex). — For the erection of villa residences, Southend, for Mr. R. S. Frazer. Mr. E. Wright, architect:

Munday & Co.	£2,488	Dobson	£2,181
Baker & Wiseman	2,240	A. Ansell	2,147
Dupont	2,215	Officer	2,096

[Architect's estimate, £2,150]

STROUD GREEN. For erecting new branch of the London and South Western Bank, 11, Finsbury-terrace. Messrs. Truefitt & Truefitt, architects, 5, Bloomsbury-square, W.C. Quantities supplied by Messrs. Morris Evans & Sons:—

J. Hunt	£1,724	Lidstone	£1,576
R. D. Lunn & Sons	1,670	Wells	1,479
Bryen	1,540	G. E. Bryan & Son*	1,367
Davey	1,295	* Accepted.	

SUTTON (Herefordshire).—For the erection of garden and terrace walls, at Sutton Court. Mr. G. H. Godsell, architect:—

W. Bowers & Co.	£313	0	H. Welsh	£197
J. J. Davis	282	0	Lewis & Co., Hereford*	190
R. Andrews & Son	236	10	* Accepted.	

SWAY (Hants).—For the erection of new kitchen and other works at the Forest Heath Hotel, Sway. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton:—

H. E. Rashley, Milford-on-Sea (accepted)	£200 0 0

TAUNTON.—For the erection of new schools, buildings and other works at Huish's School, for the Governors. Mr. J. Houghton Spencer, architect, 3, Hammet-street, Taunton:—

Cowlin & Son	£2,818	A. J. Slade	£2,611
G. H. P. Bird	2,800	J. Mattocks	2,750
W. F. Ingleman	2,650	S. Dibben, Trull*	2,500
J. Morse	2,629		

[Accepted, subject to certain modifications.]

TITLEY (Herefordshire).—For additions to Titley Court. Mr. G. H. Godsell, architect:—

Lewis & Co.	£165	J. J. Davis, Leominster*	£140
		* Accepted.	

TOTNES.—For the erection of an entrance lodge, at Dittisham, for Mr. R. Harvey, J.P. Mr. W. M. Tolit, architect, Totnes:—

W. Trevett	£501	Bros. & Ash	£490 0
J. Cave	490 10	Pear Bros., West Alvington	490 0
F. W. Vanstone	490 0	Lott*	430 0
Rabich & Brown	490 0	* Accepted.	

TUNBRIDGE WELLS (Kent).—For the erection of ironing and drying rooms, with an additional story, &c., to the old Workhouse, and new Infants' Ward, for the Guardians of the Tunbridge Union. Mr. W. Oakley, architect, 36, Mount Pleasant, Tunbridge Wells. Quantities by Mr. Thos. Lodge, Tunbridge Wells:—

Edward Smith	£2,525	0	Hobbs, Averd	£2,403	0
Jones, Lonsdale, & Co.	2,500	0	G. E. Wallis & Son	2,344	0
G. H. Dashe & Son	2,344	0	G. J. Jones	2,296	17
J. Jarvis	2,298	0	A. E. Penn, Penn-bury (accepted)	2,237	19
Davis & Lemey	2,241	0			

WAKEFIELD. For laying water-mains, with meter chambers and appurtenant works, in the township of Crofton and Walton, for the Union Rural Sanitary Authority. Mr. Frank Mason, Engineer, Tetley House, Kirkgate, Wakefield. Quantities by Engineer:—

	Crofton.	Walton.
J. W. Fisher	£1,493 16 2	£1,187 4
F. Eyre	757 8 5	550 8
F. Pickles	752 17 3	537 14 11
Ghas. Green	812 0 0	435 10 0
A. Ward	694 11 4	351 15 8
Fawcett & Son	666 0 6	327 17 2
G. & T. Wilson	571 4 5	328 10 4
J. Brayshaw	566 8 4	304 11 6
Bullough & Co.	552 0 0	297 17 6
Robins & Thompson	526 5 1	293 7 7
J. Slinger	458 3 8	274 2 4
R. Mosley	471 18 2	270 13 4
Thos. & John Young	447 0 6	268 15 4
Wm. Dobson, Dewsbury*	428 4 2	260 11 0
Brooke & Leggott	402 14 1	278 14 2
J. & J. Aitfield	361 7 8	177 11 11

* Accepted for both † Withdrawn. ‡ Informal.

WIDNES.—For the erection of a laundry, &c. (exclusive of drainage and concrete foundations), at the Fever Hospital, for the Local Board. Mr. John S. Sinclair, Surveyor, Town Hall, Widnes. Quantities by Surveyor:—

Joyce & Keddie, Widnes (accepted)	£219

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VOL. LXI. No. 2511. SATURDAY, MARCH 21, 1891.

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Plans of Ground and First Floors ..... *Two Single-Page Ink-Photos.*

Villa Residences at Dynas Powis, near Cardiff.—Mr. W. H. Dashwood Caple, Architect ..... *Single-Page Photo-Litho.*

Ancient Coped Stones at St. Tudy and Lanivet, Cornwall.—Drawn by Mr. Arthur G. Langdon ..... *Single-Page Photo-Litho.*

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A Manual of Public Health.

THE book published under this title by Dr. Winter Blyth is a very important one of its class, covering a very large field.* It aims at giving an outline,—for only an outline of such a great subject can be given in one volume,—of the conditions of the maintenance of public health. How extensive is the ground it covers will be at once recognised on a mere enumeration of the headings of the twelve main sections into which it is divided, and which are as follows:—1. Statistics. 2. Air—Ventilation—Warming. 3. Meteorology. 4. Water Supply. 5. Drains—Sewers—Sewer Disposal. 6. Nuisances. 7. Disinfection. 8. Zymotic Diseases. 9. Isolation Hospitals. 10. Food—Diet. 11. The Duties of Sanitary Officers. 12. Inspection of Food.

Thus it is at once a medical and a sanitary treatise, the key to the object and plan of the work being given in the words of the preface; "it is intended to convey the author's idea of the subjects of special knowledge necessary for those engaged in either an administrative or subordinate capacity in the Public Health Service to be acquainted with." No one could be better fitted than Dr. Blyth, by acquirements and experience, to give such an outline of the subject of Public Health considered from the administrative point of view. In regard to the sanitary questions with which we are more directly concerned we do not gather that the author professes to furnish any new lights, but rather to tabulate the systems which may be employed, and give his opinion as to the degree in which they subserve the great object which he has in view, the maintenance of public health at the highest average possible under present circumstances. It is with this limitation that all such efforts must be considered; for it will be many years, or rather many generations, before even the best sanitated society can arrive at the point at which finality can be believed to have been reached; a conclusion which should be rather encouraging than the reverse. During the last quarter of a century we have got, we may be justified in thinking, fairly on the right road towards increasing the healthfulness and duration of human life; the progress made in that period seems, comparatively speaking, immense; yet it may be that in reality we are but at the commencement of the fight against the causes which tend to encourage or produce disease and to shorten life, and that far greater progress than we have even dreamed of in that direction may be in store for future generations. In the meantime, every book such as this, by an energetic and practical worker in the cause, tends to help it forward.

Into the more purely medical sections of the book it is not our part to go; we can only say that we believe no one who is concerned with the subject of Public Health will do wrong in giving attention to Dr. Blyth's suggestions, whether or no they are such as all other members of his profession will concur in. But it is of interest to note the opinions of a medical man on those sanitary operations which in their details are the more special province of the engineer.

In regard to the principal sources of water supply, rivers, wells, and lakes or artificially-formed reservoirs, we observe that the author expresses no decided opinion as to any general preference to be given to any one of these classes of supply from a medical point of view, beyond the remark that a stream is very rarely pure enough to be used directly. In regard to his remark that "in the majority of instances a water-supply from a river can be led into a storage reservoir by gravitation alone, provided the intake is placed high enough up the river," it must be remembered, and should have been pointed out, that where a large supply is required, this involves the loss of all the watershed of the river below the point of intake—in fact impounds a very small proportion of the flood waters, so that it is hardly applicable where it is an object to utilise the river to the utmost that can be done without unduly robbing it as a river. The author sums up in favour of constant supply to houses, a conclusion from which few will differ. The minimum desirable quantity of "thirty gallons a day per head of population," for this climate, will probably have to be considered as too low before long, as the daily use of large baths increases, as it is pretty certain to do.

Dr. Blyth's table of consumption per head of population for a number of cities is of interest. London, with its 31·25 gallons, stands well among European cities, but American cities are far more sumptuous in their water supply; Chicago registering 102·5 gallons, New York 60·9, Washington 143·0, Ottawa 192·5, San Francisco 64·5, Philadelphia 54·15. It is not quite clear whether these are quantities consumed, or quantities estimated and provided for; but in either case water supply is far more liberal in the United States and Canada than in England. Bombay stands at 20·0; Calcutta at 2·2 per head is probably a misprint.

In regard to drainage we observe that the author adheres to the recently accepted rule that the house drain should be cut off from the sewer by a syphon or disconnecting chamber; but he records the opinion that the traps to the mouths of the house drains should be regarded as belonging to the local authority and be liable to official inspection. There may be difficulties in the way of this, but we concur in thinking that it would be highly desirable that it should be so, considering the ignorance and indifference of so many private owners in regard to drainage. It is rather out of date to say that "water-seal traps of approved form may be considered as perfect barriers to sewer-gas"; they are, when properly constructed and ventilated, very efficient practical checks, but hardly to be called "perfect" in that respect.

The whole of the chapters on drainage consist in the main of a brief recapitulation of existing methods, which is perhaps all that the scope of the book demands; the present drainage system of London is described in a separate chapter and illustrated by a map. In the chapter on water-closets the author draws attention to the unhealthy effect of the old system of boxing up water-closet seats in casings, within which "the whole space is not unfrequently a receptacle of dirt and filth and a cause of air contamination." We have commented strongly on this, and also on the similar system of casing up baths; the objections are less in the latter case, but in both there is a dark, boxed-up

a

* A Manual of Public Health. By A. Winter Blyth, M.R.C.S., L.S.A. London: Macmillan & Co., 1891.

space, which is never cleansed nor swept. In describing the system of water-waste preventing cisterns, we are surprised that Dr. Blyth should give, without a word of comment, the statement that such cisterns "generally hold a charge of two gallons;" they do, but this is far too little, and even if it be effectual in cleaning out a well-designed pan, where the most is made of the flush of water, it is too little for carriage to the sewers; economy of water in this way is a danger to the health of towns, and a larger cistern ought to be compulsory in the official by-laws. Water companies have no right to interfere with efficient drainage for the purpose of saving water; the remedy is worse than the disease.

Into the subject of ventilation the author goes much more fully. Among the special principles laid down we are glad to see that he recognises that the top of an apartment is not the place to admit fresh air, but preferably a few feet above the floor. When air is warmed in entering, even a lower point than this may be advisable. In speaking of means of extraction of air, Dr. Blyth is unquestionably right in his opinion that the influence of cowls has been much over-rated. The fact is, they depend on wind for their action, and when the air is still they are less efficacious than an open tube. Of course this entire stillness of the external air is not a very frequent condition, but it should be recognised as a condition which has to be dealt with. On days of typical London fog, when the air is still and laden with impurities, we have known it actually pouring down chimneys provided with what are supposed to be extraction cowls. We are entirely with the author also in the opinion that for large public buildings, such as schools, assembly-rooms, theatres, &c., mechanical ventilation is the only kind of ventilation that can be relied on. We presume the author has an adequate basis of observations for the important statement which he gives in regard to this subject, that "in schools badly ventilated on the natural system, the micro-organisms increase up to a certain point with increase of floor and wall space, whereas in mechanically ventilated schools where the air is quickly renewed, the micro-organisms decrease with increase in cubic space." The following table of statistics on this subject is given:—

Cubic Space per Person.	Naturally Ventilated.				Mechanically Ventilated.			
	No. of Cases.	Carbonic Acid.	Organic Matter.	Total Micro-Organisms.	No. of Cases.	Carbonic Acid.	Organic Matter.	Total Micro-Organisms.
Cubic Feet.								
50—100	6	21·5	16·2	119	..	..	..	..
100—150	14	15·5	19·6	128	7	14·0	7·8	23
150—200	5	18·9	12·3	150	8	11·4	9·0	14
200—250	9	21·1	16·8	188	5	11·8	12·3	10
250—300	4	17·1	9·5	187	..	..	..	..
300 and upwards	4	15·1	11·8	12	6	13·0	3·7	2

The comparative cost per head for the two systems is given, as the result of observations on schools in Dundee, as being, for a school of 1,000 children, 2¾d. per head for natural ventilation, and 7½d. per head for mechanical ventilation. "The cost will be greater in towns where coal is dearer, less where coal is cheaper than in Dundee. But in any case £20 to £25 per year per 1,000 children should be considered well spent if it conduce to greater purity of air;" a conclusion which we fear some promoters of schools are still unwilling to adopt, but public opinion must inevitably force it on all before long; or if not, legislation ought to intervene. One suggestion is made in this chapter which deserves more consideration, viz.: as to the value and comfort of double windows in cold weather. The layer of air between the two gets to some extent warmed; whereas in buildings with large windows, such as churches, schools, and some other classes must necessarily have, the expanse of glass becomes a refrigerating surface chilling the internal air of the room perceptibly in its neighbourhood.

The long chapter on "Nuisances" is an exceedingly useful one, giving a description of the various trades from which nuisances dangerous to health arise, the special part of the process, or the special materials employed, which are injurious, and in the majority of cases suggestions for minimising these evils. The list is a longer and more formidable one than many persons not officially concerned with abating nuisances are aware of. "Gut-scraping" appears to be one of the very worst, at least to those concerned in it; so much so that official inspectors, who may be supposed to be tolerably hardened, have found difficulty sometimes in going through their duties, though its effects are not so multifarious or so much calculated to produce public nuisance as, for example, the business of slaughter-houses. On this head the author expresses the hope that the time is not far distant when private slaughter-houses in large population centres will be abolished. "The public health cannot be protected, nor the sale of diseased animals controlled, except in abattoirs." Among other trades classed among the nuisances are soap-boiling, tanning, glue-making, india-rubber manufacture, gas-making, manufacture of pyroligneous acid from wood; manufacture of alkali, sulphate of ammonia, sulphuric acid, glass, tin-plate working, Portland cement, &c., &c. The fumes from calcination are the offensive part of the latter manufacture; glass works also produce acid emanations; tinplate also, from the "pickling" of the plates in acid. Of one trade specially connected with building, namely brick-burning, Dr. Blyth speaks very strongly, at least in regard to the process known as "clamp-burning." As the subject has been a good deal under notice of late, it is worth while to quote his opinion on this head:—

"Clamp burning is especially offensive. The emanations are watery vapour, thick smoke, the usual gases of combustion, very often sulphuretted hydrogen, and certain pyroligneous matters which have an offensive odour. Where, as is often the case, household refuse is used containing animal and other organic matter, the odour is intensely disagreeable. The emanations are often acid, irritating to the mucous membranes, and injurious to vegetation.

The fumes from burning bricks differ in composition very much in the different stages of the process, the clay used, and the fuel employed. Clamp burning, as the most offensive process, *should be entirely prohibited in the neighbourhood of large towns.* Kiln burning by careful stoking, by the use of certain special kilns, and by the aid of a long chimney shaft, can be carried on with but trifling offence."

The italics are ours. It will be remembered that not long since the offensive smells complained of as infecting a large area of London in the Paddington and Marylebone district were attributed to brickfields outside this quarter of London.

In regard to stables in towns Dr. Blyth thinks there is much to be done in the way of improvement as regards their effect on the health of persons in their neighbourhood. The effect of ill-built and ill-ventilated stables on the animals themselves is not, of course, within the limits of his subject, or we imagine he would have something to say on that point also. But he observes that the keeping of stables and mews in order is a daily care to the sanitary authorities of large towns, more especially when the floor above is used as a habitation (as is the case in most of the London mews):

"In the metropolis there are many thousands of persons living over stables and constantly breathing an atmosphere impregnated with ammonia. There were no reliable statistics on the subject, but such conditions cannot be conducive to high vigorous health. Stables should of course have a perfectly impervious floor, and the drains should be well laid and of good materials. There should also be no difficulty in making the floors of the living rooms above stables of impervious material, and I think a sanitary authority would be justified, on complaint of nuisance owing to stable emanations rising through a pervious floor, in giving notice to remedy the nuisance."

This stable question is a serious matter for London, where large stables in the heart of thickly-inhabited quarters are an absolute necessity; and considering how little room there is to spare for them, and how seldom any opportunity can occur for extending the confines of a mews once built and its limits defined, it seems almost unavoidable that the grooms and stable-men's habitations should be over the stables, economy of space compelling it. There cannot be a question that in all such cases there should be a concrete or other species of impervious floor over the stables, and it is to be wished that Dr. Blyth's hint should be acted upon. It must be admitted, however, that the requirement to alter this unfit condition of human habitation may be a more serious thing for the landlord than the author perhaps realises; as in some cases at least it would mean rebuilding the whole block, in cases where the existing walls were not fitted to carry any but a light wooden floor.

The greater portion of the remainder of the volume is occupied with the consideration of purely medical subjects. There is a short chapter, however, on the principles of construction of Isolation Hospitals. We may note in regard to this subject that the author specially records that in his opinion wards should always be constructed with solid walls of stone, brick, or concrete; "corrugated iron hospitals lined with matchwood, and wooden huts, have all been failures as regards temperature and comfort." It is important to note this as a medical opinion in regard to a form of hospital building which has been considered in many quarters satisfactory, at all events to meet an unexpected demand. Two plans of small isolation hospitals which are given as model plans recommended by the Asylums Board, are defective in several points, and admitted to be so by the author; why not then have given a better one?

The standard set up by Dr. Blyth in regard to "duties of Health Officers" is high enough, higher perhaps than is generally attained to, though on the whole we believe there are few professions in which a more conscientious spirit is brought to the work in hand. "The Medical Officer of Health," says the author, "should aim at the high ideal of endeavouring to collect in his office details as to the drainage, water-supply, construction, tenancy, and disease history of every single house in his district. The information should be contained in indexed books, so that at any time he can in a few minutes give the whole sanitary history of a house." This is a splendid ideal, especially in view of the fact that, as Dr. Blyth suggests, people intending to take up residence in a house could in that case apply at the Health Office and get information which they can now only obtain by inquiries in several quarters. Query: can they in many cases obtain it at all?

On the purely medical portion of the book, as observed, we cannot enter here, but much of the information contained in it, and which we may pretty safely assume to be sound, is of great value in regard to the best means of guarding against the dangers to health almost inseparable from the conditions of life in crowded cities; and on this ground the book is well worth the attention of the general public, as well as of the class for whom it was specially written. It appears opportunely, too, in the early part of a year in which public attention is to be especially directed to the subject of public health on the occasion of the International Congress of Hygiene to be held in London in August.

Good Friday Week.—Next week we go to press a day earlier than usual. All communications for the Editor should reach him *by first post on Wednesday morning;* but lists of Tenders will be received up to 12 noon of the same day.

Old Cottage Architecture.—Mr. Ralph Nevill, whose previous work on "Old Cottage and Domestic Architecture in Surrey," has been noticed in our columns, is bringing out a second edition of this work, as well as a new volume on the Old Cottage and Domestic Architecture of Gloucestershire. The principal portion of both works has appeared in our pages in the first instance.

AGENTS' COMMISSIONS.

THERE is probably no business point upon which there is greater laxity and want of moral strength than in regard to the taking of commissions by agents. The thing is done with such ease, the results are often so remunerative, that good intentions may frequently be overcome. Moreover, there is so much money made every day by what may be called illegitimate commissions that the impropriety of receiving commissions is often scarcely recognised. But the broad, clear principle is that an agent must not receive commissions from third persons for simply doing his duty; and if he does receive them, they belong to his principal. The principle has recently been re-enunciated by Mr. Justice Kekewich in a passage which is worth consideration by all business men. True, he had to apply it to dealings with a ship, but it is as applicable to a house as to a vessel; indeed, as we shall see, it is applied by the Judge by way of example to the case of an estate agent. "A paid agent," he said, "I am not now concerned with an unpaid agent, is bound to discharge all those duties, multifarious or otherwise, and onerous or otherwise, which the terms of that agency cover. He must make his own bargain with his principal, and it is his duty to do all that that bargain entails and to be content with his remuneration. If he is called on to do anything outside the terms of his agency, he is entitled to make a special bargain, or he can decline to do it unless he is remunerated on a special footing; or he may do the work, and, provided everything is fair and above board, he probably would be allowed some fair remuneration according to some recognised measure of the value. But if he does anything within the terms of his agency, however uncompensated it may appear to him personally, he can neither charge for it in his account, nor can he secretly take any commission for it. Take such a case as that of an estate agent: if the landlord requires him to see after the building of a cottage, which involves the purchase of timber, it would be the duty of that agent to purchase the timber on the best possible terms, and if he happens to be a timber merchant he cannot supply the timber at a profit. If he deals with another timber merchant, who is disposed to give him a commission for the introduction of the business, he must either decline that commission, or, if he accepts it, must give his employer the benefit of it." These observations are worthy of note, more especially by those who are at the beginning of a business career. Let us apply them to other cases. If an architect is offered a commission by a manufacturer he must either decline it or "give his employer the benefit of it." If a builder employs a solicitor to procure a sum of money on loan for him, the payment for the work being either a fixed sum or a percentage on the amount of the loan, that solicitor is not entitled to take any commission from the lender; if he does, it ought to be handed over to the borrower. Again, it is equally clear that if a builder is employed to do work for which he has to obtain certain articles, such as stoves or ranges, he has no business to charge the employer a nominal sum and take the trade discount for himself. It would be allowable and proper to charge a sum for the labour or skill of selection; but, as is so often done, to charge an employer a particular sum for an article and to receive from the manufacturer a commission or discount, is clearly not allowable according to the principle enunciated by Mr. Justice Kekewich. But it is a matter of common knowledge that comparatively upright men receive all sorts of illegitimate commissions which have become so common that it is forgotten that it is illegal to keep them. It may be feared, indeed, that the practice has become in many quarters so common that it will never be eradicated. From time to time it receives the condemnation of the Bench, and commissions have to be disgorged. But the young practitioner or man of business cannot too constantly bear in mind the principle which has been stated above, and which, if he remembers it, will make him throughout his life a thoroughly trustworthy man of business. There is, however, one part of Mr. Justice Kekewich's judgment which can scarcely be regarded as correct, the fact being that it really does not convey what appears to have been the Judge's meaning. Speaking of an agent being also a timber merchant, he says, "he cannot supply the timber at a profit." This is not true; the agent, if he is also engaged in trade of another kind, cannot charge for his personal time occupied in buying—selling, so to say, from or for himself to himself—for his employer. Nor may he make any illegitimate profit, but he is entitled to sell his articles to himself for his employer at a fair market rate, such as will give him a fair business profit on the sale. Take the case of a "sanitary engineer" engaged by a householder, the former being also the owner and maker of a patented trap. It would be perfectly fair for him to supply the article at the ordinary market rate, which will give him a profit on the manufacture. If the whole of the judgment of Mr. Justice Kekewich is perused, clearly this is what he means, though the actual sentence above quoted would seem to imply the reverse. The judgment is so valuable, and worthy of perusal from a practical point of view, that it is to be regretted that this slip of verbal expression should have appeared in it.

NOTES.

SIR JOSEPH BAZALGETTE, concerning whose work some particulars are given on another page, was a great engineer who had the good fortune, which does not happen to all gifted engineers, to have great opportunities set before him. It does not often happen to one man to have to carry out two such immense and important works as the embankment of the Thames and the drainage of London. The latter operation, unhappily, has not proved to have the character of finality which some sanguine persons expected of it. As far as turning the sewage into the Thames went, it was an immense mistake; but it was a mistake which took us one step at all events, and that an important one; it took pollution from the subsoil of the city and relegated it to the river. The work of the present generation is to get it out of the river. The Thames Embankment is a truly great and monumental engineering work; it might have been still finer in result if engineers would either study architecture or take the advice of those who do. It is marred to some extent by bad masonic detail, and by the absurd and meaningless arched erections put up here and there, apparently from some vague notion of "effect," and without any obvious motive. However, engineers are born without a sense of these things, and it cannot be helped. At the meeting of the Institution of Civil Engineers on Tuesday last, Sir John Coode, while all the meeting remained standing, delivered a few feeling words in regard to the death of their distinguished colleague, to whose professional genius he paid the highest tribute, while in regard to Sir J. Bazalgette's character it could not be better summed up, he thought, than in two words—he was a "Christian gentleman."

WE have received a copy of a proclamation of the President of the United States which has been already published in some of the daily papers, giving official notice of the opening of the Chicago Exhibition on May 1, 1893, in memory of the four-hundredth anniversary of the discovery of America by Columbus. The document concludes with the following appeal:—

"And in the name of the Government and of the people of the United States, I do hereby invite all the nations of the earth to take part in the commemoration of an event that is pre-eminent in human history, and of lasting interest to mankind, by appointing representatives thereto, and sending such exhibits to the World's Columbian Exposition as will most fitly and fully illustrate their resources, their industries, and their progress in civilisation."

There is a little of the spread-eagle about this, perhaps; but it seems to indicate that the United States Government is in earnest in the intention to make a great success of the exhibition.

WE give in another column a summary of the main portion of the report of Sir B. Baker and Mr. Binnie on the subject of the main drainage of London, accompanied by a reduced and simplified copy of the second plan accompanying the report, and which shows the two proposals for future operations, either in taking the outfall further down the river to the Sea Reach estuary, or taking the main outfall sewer away to the Maplin Sands. These are only proposed as ultimate, not immediate operations. There is another point illustrated by this map, however, which is of some immediate importance. The report recommends the continuance and further development, for the present, of the shipment of sewage out to sea, and mentions "Barrow Deep" as the site of deposit, which is said to be "practically the open sea." The exact force of "practically" here we do not understand. What is evident is that Barrow Deep is a channel between two banks, varying from one mile to two and a half miles in width, and that it is twelve to fourteen miles from the coast line on which are Herne Bay, Westgate, and Margate. Perhaps any contamination of the sea-water at that distance is hardly likely, but it does not seem to be quite impossible; and at all events the question does occur, how many years will Barrow Deep remain Barrow "Deep" with this immense amount of matter annually sunk in it? There is also to be taken into account the fact that The Barrows, the banks north of the "deep," are uncovered at low tide, and must catch a good deal of the sewage matter, which will not improve the purity of the east winds blowing up the Thames Valley. On the whole it appears to us that the delivery point for the sewage vessels should be further out, in what is really as well as "practically" open sea.

THE London Sky-signs Bill has passed the House of Commons Committee, and it is to be hoped will become law before very long, although its practical effect on existing sky-signs cannot come into operation till six years after the passing of the Act. Mr. A. T. Walmisley, civil engineer, was called as the scientific witness on behalf of the London County Council, and it may be of interest to note here some of the practical objections against sky-signs given in his evidence. A sky-sign of less height than half the width of the base would, he said, be useless as an advertisement, and a sky-sign of greater height than the base would be dangerous because the bracing wires attached to anchor the top of the vertical frame would be at too acute an angle with it to act sufficiently in resisting strain. In many of the existing sky-signs the height actually does exceed the base. A wire breaks without notice, whereas a wall generally shows signs of being in a dangerous state before it actually falls. It would be possible, Mr. Walmisley thought, to make a sky-sign safe over a new building where piers were built up purposely to secure it, but in the case of nearly all the London sky-signs the structure already exists, and is not calculated to bear this extra strain nor the lifting action of the wind-braces on the eye-bolts driven in to hold them. Before the existing specimens cease to be sky-signs and become old materials,—they will, however, have a fair chance of doing damage. Periodical inspections are much better than none; but in the interval between two inspections a maleficent sky-sign might distinguish itself, and justify legislators, by some noteworthy exploit. A guy loosened in mischief, or by further decay of

inferior brickwork, a perishing bolt, or the giving way of a frail roof used in guilelessness for supporting a sign of spirited trading,—these and other similar trifles would be sufficient provocation. Repairs and the renewal of protective coatings should not be optional, but enforced, and their execution certified as well as the general security of the structures.

An attempt on the part of Mr. J. Thornhill Harrison, M.Inst.C.E., to revive at a recent meeting of the Institution of Civil Engineers the idea that London could be adequately supplied with water in the future from the chalk formation of the upper Thames, without unduly robbing the river, led to an important discussion on the two succeeding evenings, in which a number of eminent engineers took part, the result of which may be said to be a body of expert evidence which rebuts for ever the idea that this source can be looked to for an adequate London water supply. In fact the proceedings could hardly be called a discussion, the reader of the paper being on one side, and every one else against him. As one speaker very pointedly said, the reader of the paper seemed to have forgotten that you cannot pump water from the bottom of a cistern without affecting the top level. How much the "top level" may be affected in the case of the chalk might be gathered from an account given by Mr. Mansergh, as to two wells pumping two million gallons daily, which in four or five years lowered the level of the water in the chalk stratum in which they were sunk to the extent of 14 ft. The most extraordinary statement in Mr. Harrison's paper was that the Thames has a daily increment of about 440,000,000 gallons between Teddington and Kew; a theory which appeared to be absolutely without statistical support. The paper has, however, given rise to a valuable and interesting discussion, which has in all probability disposed of the subject finally.

Bœotia is just now yielding rich treasures to the student of Greek ceramography, treasures, too, of no small importance to the mythologist. We drew attention two years ago to the local pottery found in the Kabeiroi sanctuary near Thebes, and which, owing to the learning and ingenuity of Dr. Otto Kern, threw much light on the relation between those mysterious divinities, the Kabeiroi, and those other mysteries of Orpheus. It is again Dr. Kern who in the last number of the Ἐφήμερις Ἀρχαιολογική comes forward to publish and elucidate a very remarkable Krater found in Bœotia, and now in the Polytechnic Museum. Up to the finding of this vase, probably few students of Greek ceramography would have hesitated to say that the God of Healing, Asklepios, was never depicted on vase-paintings. A feeling also existed that he was not likely to appear. The same also would have been said, with perhaps even more conviction, of the Goddess Hygieia. True though the generalization may still remain for Athenian ware, we have now a fine instance of both God and Goddess on Bœotian pottery, and it is to these *local* productions, that, less influenced as they naturally are by literary tradition, we have to look for additions to our knowledge of local mythology. On the obverse of the vase, Asklepios reclines on a couch, near which is a table spread as in the "funeral banquet" reliefs, now so familiar. His right hand holds a Kantharos, out of which a huge coiled serpent is drinking; his left hand holds an egg, the serpent's favourite food. On the reverse, a maiden brings offerings on a tray to a seated goddess who holds sceptre and phial. Above, suspended on the wall, are votive offerings of a hand and two legs, this settles the question of the cycle to which the seated figure belongs, she must be a healing goddess. Healing divinities, male and female, we are accustomed to call Asklepios and Hygieia, but Dr. Otto Kern is too well-furnished a mythologist to dogmatise on the precise attribution. Scattered about Thessaly, Bœotia, and the Peloponnese, were many a "healing" pair of under-world divinities, who finally succumbed to the dominant God. Of the interest of the one in connection with the large class of "funeral banquet reliefs," space will not allow us to speak. It seems a pity that the Ἐφήμερις should oblige Dr. Kern to have his paper *translated into* modern Greek, and thereby rendered inaccessible to many archæologists.

At the first monthly meeting of the Vereinigung Berliner Architekten, which society has the management of the architectural division of the coming Berlin International Art Exhibition, some business referring to non-German exhibitors was gone through and several letters from the presidents of non-German architectural societies specially invited to take part in the Exhibition were publicly read. Among these letters two written by M. Charles Garnier, as President of the Société Centrale des Architectes français, were of interest, especially the latter of these two, written on February 27, but two days after the first one, in which the German invitation had been very politely accepted. This second letter was as follows:—

„Paris, le 27. Fev. 91.

Monsieur et honoré confrère.

Vous avez dû recevoir la lettre que je vous ai adressée en réponse à votre communication et vous avez vu que notre Société devait se tenir dans une grande réserve: Mais depuis ce moment il s'est produit une sorte de crise qui va vendre bien difficile la participation des artistes à votre exposition.—Vous le savez. Je n'ai pas à juger les motifs qui font agir les uns ou les autres, ni à me prononcer sur l'opportunité du voyage de l'imperatrice Frédéric—je constate seulement que en ce moment l'entente est difficile et que l'ère des difficultés n'est pas encore terminée.

En tout cas et en restant dans la question artistique, la seule qui puisse être traitée entre confrères, je déplore que les forces vives des deux grandes nations ne puissent encore se rapporter sur les manifestations fécondes de l'art ou de la science, et je veux espérer, qu'un jour viendra bientôt, où, les differences politiques etant resolues, nous pourrons tous marcher ensemble, reconnaître les mérites de chacun et profiter les uns comme les autres des efforts faits dans la voie du progrès et de la paix artistique.

Quoi qu'il en soit, monsieur et honoré confrère, nous n'ignorons pas ici la valeur des architectes d'outre Rhin et, quelques soient les souvenirs et les violences qui nous separent, nous n'en estimons pas moins leurs travaux et leur amour de l'art.

Ce sont les seules paroles d'appaisement et d'espérance, qui je puisse vous adresser voulant rester avec vous en seules rélations confraternelles et gardant en moi-même la religion de lambeau de la patrie, que nous ne saurions oublier.

Et maintenant, monsieur et honoré confrère, laissant de côté ces douloureuses pensées, je viens à vous qui êtes un artiste de grand talent vous remercier d'avoir pensé à moi dans cette occasion dont le résultat n'est pas celui qu'on aurait pu espérer.

Croyez à un sentiment d'estime confraternelle.

Charles Garnier.

According to the report on the Exhibition it seems that, besides Italy, Austria, the Netherlands, Switzerland, Russia, and England will have fairly representative architectural groups. We might here remind intending exhibitors that works can now be sent in for the Exhibition, the closing date being April 10.

The Education Office have finally approved five schemes framed by the Charity Commissioners for the advancement of education amongst the skilled working-classes, under the City of London Parochial Charities Act, 1883. By one of the schemes the Saddlers' Company are vested with the control of their Robert Kitchin Charity, upon the understanding that after the deduction of 125*l.* yearly for the Company's renter-warden and costs of management, with 5*l.* 6s. 8d. yearly to St. Martin Orgar parish (by East-cheap), the annual residue shall be applied to the governing body of the Northampton Institute (675*l.*) and to maintenance and repairs of St. Ethelburga's Church, by Bishopsgate (199*l.*). We may here mention that Kitchin, who died in 1555, devised to the Saddlers all his property in the parish of St. Olave, Hart-street, upon condition that they should distribute every Sunday 12 pence to 12 poor parishioners of St. Ethelburga, pay 15s. 4d. each Christmas-tide towards the church's repair, and give the warden an annual honorarium of 3s. 4d. The property now yields an income of 1,005*l.*, derived from houses in Jewry-street and Crutched-friars. Two other schemes relate to the Bow and Bromley and Aldenham (St. Pancras) Institutes. These ordain that in each case the annual sum of 150*l.* already devoted by the Commissioners for evening classes at the Institute shall continue to be paid for three years as from October 1, 1889, and that then the Commissioners, if so advised, shall make a scheme for the same. The later schemes will set up two governing bodies, and provide for the affiliation of the Institutes with, respectively, the People's Palace Institution and the Regent-street Polytechnic, or such other like Institutions as they may name. The two remaining schemes concern the joint Committee of the College for Men and Women, Queen's-square, and the Working Men's College, Great Ormond-street, Bloomsbury. In respect of each of these, the annual payment of 400*l.*, already settled by the Commissioners, will continue, subject to the appointment of a new governing body of ten, elected by the two Councils, and the making of fresh ordinances under which the students at either College shall be entitled to share in the facilities,—by way of lectures, library, museum, common-room, &c.,—open to those at the other; and for the establishment of joint classes, Saturday-night lectures, and the like.

The Charity Commissioners have recently framed an order, under the Charitable Trusts Acts, 1853-87, for consolidating the Skinners' Company's almshouse and pension charities. In terms of the new scheme the Company will sell, or let on lease, their existing almshouses, and replace them with new buildings for six men and twelve women, who are to receive certain weekly allowances. One block of almshouses is No. 57 in Great St. Helens, Bishopsgate Within: its central panel is thus inscribed:—

THESE
ALMS HOUSES
WERE FOUNDED BY
SR ANDREW JUDD KT
CITIZEN & SKINNER
AND LORD MAYOR
OF LONDON
ANNO DOM: 1551.
FOR SIX POOR MEN
OF YE SAID COMPANY
REBUILT
BY YE SAID COMPANY
ANNO DOM: 1729

In the back yard is a fine leaden cistern embossed with the Company's coat-arms within three panels, and with date "1733." Judd, who died in 1558, and whose monument may be seen against the eastern wall of St. Helen's church, demised in part endowment for his school at Tunbridge, "a close of pasture . . . . called the Sandhills situate . . . . on the back side of Holborn," in St. Pancras parish, and then valued at 13*l.* 6s. 8d. per annum. In 1807 most of that land was let to James Burton, for ninety-nine years, at a rent of 2,500*l.* a year. At no distant time it will yield a large increase of income to the school. The other almshouse, being for twelve women, and founded by Lewis Newberry in 1633, is next to the Trinity almshouses in Mile-End-road. The two endowments are greatly augmented by the Alice Smith (1592) and Henry Spurling (1730) bequests. These two bequests, together with the William Stoddart (1611), and portions of the Lancaster (1618) and Meredith (1630) charities, produce a total of 955*l.* applicable for the scheme. The Smith charity, now worth about 800*l.* a year, seems to have grown out of a demise of 15*l.* yearly to the Judd Almshouse and to certain poor in St. Gabriel, Fenchurch, and All Hallows, Lombard-street parishes. Meredith's endowment consisted originally of the Ram Inn, West Smithfield (since sold by the Skinners), whilst

Stoddart left to them a tenement with seventeen and a half acres at Harringay. This last-named trust the Company made over to Christ Hospital, together with their interest in the hospital premises, the governors agreeing, in exchange, to pay to the Company an annuity of 6*l.*, and to receive ten Skinners' nominees in the Bluecoat School.

A RECENT number of the *Transactions of the American Society of Civil Engineers* contains an interesting paper by Mr. N. W. Eayrs on "The Ventilation of Tunnels." The two methods by which the smoke and gases of combustion may be removed,—namely, by natural means, and by mechanical appliances, are described, and the Hoosac and St. Louis tunnels are taken as examples of the two systems. Whether the central shaft of the Hoosac tunnel really aids the ventilation appears doubtful, and we should have been glad if the author had given more information on this important point. As long ago as 1838 we find a statement by Mr. West in the very first volume of the "Proceedings of the Institute of Civil Engineers" that "shafts generally are an impediment to perfect ventilation," and it appears from the report of Mr. C. S. Storrow to the Massachusetts State Commissioners of Hoosac Tunnel, that the general feeling of those in charge of the large tunnels which he visited was, that it would be better to close all shafts and trust to the quick trains for ventilation; and Mr. H. S. Drinker, the author of a most important work on tunneling, seems to be of the same opinion.

THE architectural publisher, Ernst Wassmuth, of Berlin, has lately issued a neat card (compiled by Herr R. Schmidt), showing the most important erections of the world, drawn to the same scale, and arranged according to their respective heights. The card, on which the engineer's work is represented, as well as that of the architect, gives the Eiffel tower, with its 300 mètres height, the central position; then follow the mighty cable-towers of the proposed Hudson suspension bridge for New York, with 173 mètres height, a measurement double that of the towers of the Brooklyn Bridge, which only have 88 mètres. The National Museum at Turin (architect, Professor Antonelli) will have 164 mètres, the town-hall at Philadelphia has 163, the Ulm Cathedral tower shows 161, whilst those of Cologne Cathedral have 157 mètres. Of German churches marked on the card, we find the Strasburg Minster with 142 mètres, the St. Nicholas Church at Hamburg has 147, St. Catherine's, of the same city, has 111 mètres, and the proposed Dom for Berlin (design 1891), with its 110 mètres, is also marked. The list of the world's memorial monuments illustrated, is headed by the Washington Monument (with 169 mètres), and then follow the Hercules Monument at Cassel, 98 mètres, the Soldiers' and Sailors' Monument at Indianapolis, 80 mètres, the Victory Monument at Berlin, 61·5 mètres, and the Alexander Monument at St. Petersburg, with 50 mètres. As regards to mass, the Cheops pyramid, of course, still holds its own.

THE case of Perry *v.* Eames, which was recently decided by Mr. Justice Chitty, though it will, no doubt, in due time appear in the official reports, deserves an early notice. The point which was decided in it was that the Crown is not bound by the third section of the Prescription Act, in respect of the easement of light. In other words, although persons may have had the enjoyment of light over the property of the Crown (whether that property be held directly by the Crown, or equitably, for it matters not) for a long period of years, they have no more right to the light than if they had enjoyed it for one year only. When, as in the case before Mr. Justice Chitty, the property of the Crown has been transferred to private individuals, this places them in a very much more favourable position than if they had purchased from private owners. The land in question was that formerly the site of the old Bankruptcy Court in Basinghall-street, referred to in a "Note" recently. The practical importance of the case, however, is that it must put persons on their guard in reference to the purchase of property adjoining land of the Crown. For they may find themselves, to their surprise, with their buildings deprived of light after an enjoyment of many years, and without a legal remedy.

THE Edinburgh *Evening Dispatch* published last week a rough plan, showing the manner in which it is proposed to alter the external steps up to the Register House at Edinburgh (a building of Adam's, as our readers will remember), in order to throw back the boundary wall in front of the building, to gain more room in the street. The wide upper flight of steps, immediately facing the portico, is to be retained; the two curved wing flights are to be removed, and replaced by straight flights at right-angles to the upper flight, and parallel with the street. A considerable space is thus gained on the foot-pavement, but none to the roadway except to a slight degree at the turning into Leith-street. On the other hand the removal of the curved flights of steps will rob the building of half its dignity and architectural effect. It appears to us to be a most ill-judged injury to a fine architectural composition, carried out for a very questionable degree of practical convenience, and we much regret that it is to be done. The Scottish Board of Works is responsible for the scheme.

OPERATIONS have begun in connexion with the restoration of the nave of the Abbey Church at Haddington, under the superintendence of Messrs. Hay & Henderson, architects, Edinburgh. In the course of the operations it was discovered that the building contained a valuable library, the existence of which had gone out of mind, and which had lain unused probably for a century. It was found to contain, amongst other rare works, a fine black letter copy of the "Homilies of the Venerable Bede" (1533), which retained its original embossed binding; "The whole works of W. Tyndall, John Firth, and Dr. Barnes, three worthy Martyrs" (1573); a fine copy of Henry Stephen's "Translation of Herodotus" (Frankfort, 1594); and many beautiful editions of the Latin Fathers, some of them in the original binding, and having the printing strong and dark. There are also many theological treatises of the seventeenth century; several volumes of sermons preached before Parliament and during the Protectorate of Oliver Cromwell; sermons and pamphlets of the reigns of Charles II. and James II., one of which is by the notorious Dr. Oates, besides many other works of great value. There is a parish library in the town, which was attached to the Burgh School, and, were these two collections combined, they would form a good starting point for the formation of a free public library, were the inhabitants to adopt the provisions of the Act.

A COMMITTEE has been formed for the purpose of arranging for an Heraldic Exhibition, to be held in Edinburgh during the present year. Accommodation will be provided in the Historical Portrait Gallery.

THE Exhibition of the Institute of Painters in Water-colours suggests, as usual, a regret that the Institute has such large rooms to fill. At the time when they gave up their old small Gallery in Pall Mall they had hardly enough really good work to fill that; there seemed to have been some kind of vague idea that a fine building and a large suite of galleries would give new life to the Institute; unfortunately it only serves to emphasise their artistic poverty. There are works of the first order, no doubt, but they are nearly swamped in the medley of mediocrity, and worse than mediocrity. Mr. Austen Brown's "Feeding Calves" (15) is a fine study of real artistic power; Mr. Wimperis contributes two or three of his fresh and broadly executed landscapes which represent, more closely than any other contemporary work, the style and feeling of David Cox: "Reed Cutting" (122) is perhaps the best. Mr. Halswelle's large view of "Christ Church, Hants" (152) cannot be denied a certain power, but it exhibits even more than usual the defects of the flashy and pretentious style to which he has descended. Sir James Linton contributes three works, portraits, all splendid in colour and a delight to the eye in that way; "Miss Marjorie" (426), a young girl with a violin, which may be called a study in crimson; "Miss Agnes Ashbee" (234) in a green gown balanced by a red table-cloth; and "Mrs. F. G. Langham" (645), a study in rich warm browns. Mr. East has taken to illustrating London scenes, "Haverstock Hill" (371) and "At the Eyre Arms, St. John's Wood" (439), in which he fairly succeeds in combining local truth with artistic effect; but we preferred his landscape subjects. Among landscapes, besides those already mentioned, is a fine one by Mr. H. G. Hine, "On the Malling Hills" (640); "In Broadgate Park, Leicestershire" (657) by Mr. C. E. Johnson; "A Green Hillside" (534) by Mr. Joseph Knight, a remarkably real bit of country and clouds; "A Song of Spring" (484), an upland field with a girl driving calves, noticeable for its bright effect of morning light. Among figure pictures Mr. Stock has made a success with his figure of "The Temptation of Eve" (111); Mr. John Tenniel contributes a humorous study of "Gil Blas arraving himself in the Blue Velvet" (230); Mr. Frank Dadd paints the death of a Puritan soldier "The Captain of the Troop" (707), a composition with many figures but not very interesting; and Mr. Towneley Green has one or two of his small realistic paintings of everyday life, very careful, but which tend to become somewhat hard and dry in execution. The exhibition includes rather a large number of architectural subjects, among which are "York Minster from the City Wall" (71) by Mr. Harry Hine, a rather sensational view, shewing the cathedral bathed in a red light; Mr. F. S. Pilleau's "St. John the Baptist, France" (69); Miss Mawe's "Chapel of St. Erasmus, Westminster" (81), a large, highly-finished interior, very good as architectural drawing, though not very pictorial; Mr. Phené Spiers's "Whitby Abbey" (211); Miss Horton's "St. Bartholomew's Church" (229); Mr. Horn's large and ambitious drawing of St. Pauls (262), powerful in effect, but the curves of the dome are out of perspective; Mr. Harry Hine's "St. John's, Cambridge" (274); Mr. Macquoid's "Puerta de Santa Maria Burgos" (318); Mr. Fulleylove's "Ely Cathedral" (403), in which the architecture does not seem duly perpendicular; Mr. Lessore's "Entrance to the Ducal Palace" (480) and the same artist's "Notre Dame" (33)—the general effect is finely given, but the texture of the masonry is too woolly; Mr. Arthur Severn's large view of "Florence" (608); and Mr. F. Dillon's "Temple of Luxor" (615).

THE collection of the drawings of the late Charles Keene, at the Fine Art Society's Gallery, forms a most remarkable exhibition of power of draughtsmanship and of expression of character, conveyed in a method of execution which at first sight seems very ill adapted to definite expression in drawings on a small scale. Keene, it might be said, *painted* his subjects in pen line; he did not use outline or definite lines of delineation in making out his subjects, but worked by massing a number of lines to produce contrasts of light and shade. His freedom of style in this work, and the certainty with which he was able to produce the effect he aimed at, were alike remarkable. In the original drawings the effect is superior to the reproductions, as Keene frequently employed gradations of tone in the lines themselves, some



Hissarlik: from the "Old Scamander" River.

of which are in fainter ink than others; and these gradations were necessarily lost in a photographic reproduction. He did not carry it so far as to risk the loss of any important element in the effect; but the result in the reproductions was sometimes a hard, bristly appearance in the workmanship, which is not apparent to anything like the same extent in the originals. It is difficult to pick out any from this large collection, they are of such equal merit; we can only recommend readers to go and see them. As examples of Keene's power of giving what may be called professional character in a figure, we may mention his two clergymen in "The Sermon Question," the head waiter in "In Confidence" (39), and (still better) the two sketches of "Robert," 79 and 98: the middle-class young lady in "A Financial Crisis" (101): Keene generally avoided the lady proper, though he could draw her well on occasion. The omnibus-driver in "Characteristics" (171) is also an admirable type of his class; also the "lower middle class" man in the railway-carriage (180) who indignantly relates how he had ordered "chromios" to hang up in his house, and was put off with drawings "done by 'And—done by 'Aud, Sir!" The man's face is a perfect summary of the tradesman view of art. As a mere draughtsman Keene's powers were remarkable (see the foreshortened horse in No. 158); but he was much more than a draughtsman; he was a clear-sighted critic of life and manners. Mr. Claude Phillips does not tell us in his preface whether Keene invented his own subjects and dialogues. Many of the latter are as witty as the drawings which illustrate them.

THE small collection of works by Diaz, on view at the Goupil Galleries, rather tends to lead to the conclusion that Diaz was an over-rated man, and that his admiration for Rousseau did not do him much good. He endeavoured to imitate Rousseau's style, which was really not his own natural one, and he rather got hold of its weak than of its strong points. Diaz had a faculty, however, for giving the effect and the sentiment of deep woodland scenes only touched here and there by lights straggling through onto the stems of the trees, as in the unnumbered picture "In the Forest," perhaps the best in the collection. The large "L'Orage" (6) is too heavy and loaded in effect, and the same may be said of others, though there are some fine bits among them; and at all events Diaz is never commonplace.

CATALOGUE OF MOULDINGS.—In our notice of Mr. Samuel Elliott's catalogue of mouldings last week (p. 214) we regret that by a slip of the pen we described him as of "Banbury." Of course we should have said "Newbury."

RECOLLECTIONS OF A VISIT TO HISSARLIK.

THE accompanying sketch represents pretty faithfully the appearance of the mound of Hissarlik, claimed by Dr. Schliemann as the site of Troy, as I saw it just twelve months ago, in March, 1890. It was then my good fortune to be, for a short time, the guest of the great explorer of lost cities, who was then beginning what has unhappily proved to be his last of his long series of researches.

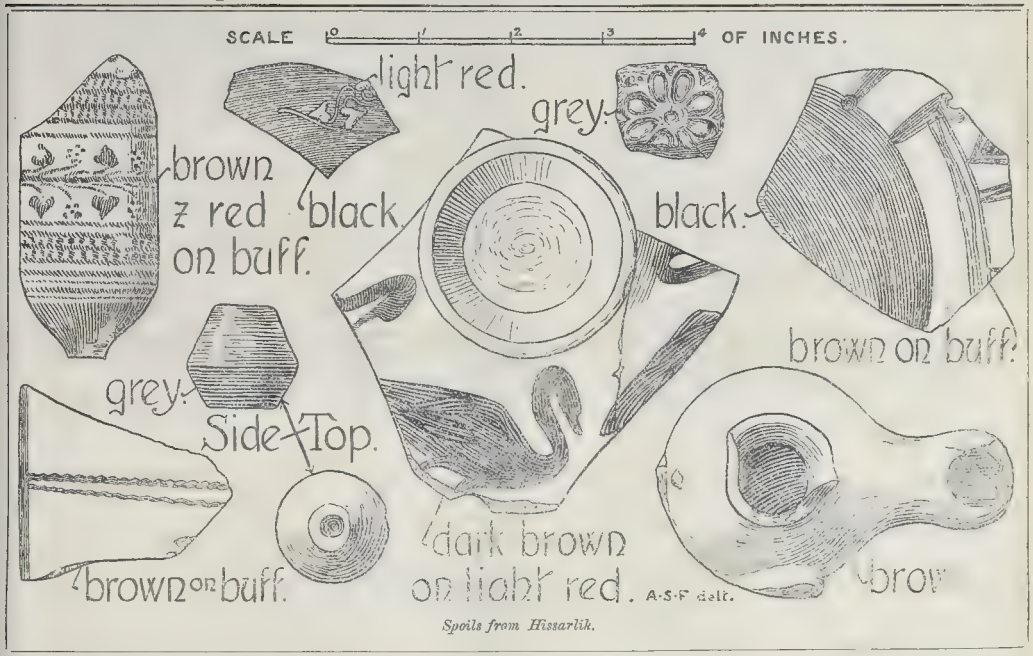
Having in a manner found my way there unexpectedly, or at least at very short notice, in the course of a holiday ramble, without having made any preparation by reading or otherwise for a critical examination of a place so large, important, and abounding in perplexities, and having been debarred by other arrangements from availing myself of Dr. Schliemann's generous hospitality for more than two days, a very inadequate period in which to study all the vexed problems of that famous site, it would be in vain to attempt to give a description of Hissarlik which might pretend to any archæological value, but a few words to explain these sketches, and some recollections of my host, may be of interest to those who have neither seen the place nor the man.

First of Dr. Schliemann himself; and indeed it was worth while going a very long journey only to see and converse with him, and especially where his exceptional characteristics could be best appreciated, when busy at his favourite pursuit, and on the spot with which his name must always be identified. The immediate impression he gave was that of being a really powerful man, a man of immense determination and energy, and I could easily imagine him as a great commander, if fate had led him to such an outlet for his abilities. Indeed, with his short, sturdy, upright build, quick, but firm and searching glance, ruddy, weather-beaten face, and close-cropped grey hair and moustache, he much more resembled a veteran general than answered to the usual conception of an antiquary. He appeared marvellously young for his age, both in bodily vigour and in activity of mind, and on getting to know him well (for being only a party of five, and camping out as we were in a very unconventional way, we got far more intimate than would elsewhere be possible even in a much longer time), I was as much drawn to him by his overflowing kindliness and good humour, as impressed by the sense of his strength. It would be difficult to find anywhere a more genial and thoroughly considerate host, and as the literary quarrels in which Dr. Schliemann was unhappily involved have given in some quarters an unfavourable idea of his personality, it is pleasing to have this opportunity of recording that my remembrance of him is entirely of experiencing the greatest courtesy and kindness. Moreover, however his scholarship may be found fault with, his mind was extremely well stored, and his readiness of wit remarkable, making him a most delightful companion; and though his faculty for languages is well known, the endless flow of the stories, jokes, anecdotes, and poetical quotations with which he entertained us, was really amazing. If he had his own choice, the conversation would have been chiefly carried on in Homeric Greek, but in deference to our unequal powers, he generally talked in English or French, though he must have run off at times into quite half a score of other languages, ancient or modern. His workmen, of whom there were about sixty, were some Greek and some Turkish, and during the whole of the very long working day, he seemed as it were to be supervising each man at the same time, directing every action, showing just where and how to work, whether with pick or shovel, basket or barrow, and all the time exhorting and encouraging every man in his own language.

In this occupation he was well seconded by Dr. Dörpfeld, who was also very kind about showing and describing the results of their labours, but, unfortunately, ignorance of German prevents me trying to reproduce much of what he said.

The general view of Hissarlik, which is reduced from a water-colour sketch done on the spot, is taken from the opposite bank of the little river called the Old Scamander, and shows how the mound rises sheer from the flat alluvial plain which extends down to the sea, about three miles distant. "Troy" itself occupied the outermost spur of the triangular tableland, on either side of which the Scamander and the Simois flow slowly along with many windings till they meet in the marshes a few furlongs below, while the later "New Troy" stretched out over the level upland behind it. The position must have been naturally a strong one, occupying the highest ground for a considerable distance around and partially protected by the marshy beds of the rivers for half its circumference, and was probably of great strategic importance as covering the entrances of all the valleys which converge at that point, against any enemy advancing inland from the coast. The present outline of the mound has been produced by the various trenches dug through it by Dr. Schliemann on his different visits, leaving pier-like masses standing up here and there, which show by their undisturbed vegetation the level of the former surface. Some of the trenches were at that time being driven further inwards with great zeal, and the dark-looking slopes at the nearest corner of the mound were formed by the fresh earth and stones just being tipped down, while the small figures above represent the working-parties, and may be useful as a scale to the whole scene. These last excavations were being carried on quite in modern engineering fashion, with the aid of good English or German tools, and even of four-wheeled iron trollies running on tram-lines, to which the picturesquely clothed, wild-looking labourers, and the armed *zaptieh* always on guard, formed an amusing contrast.

Among the small oak-trees on the ridge behind may be seen the wooden huts where Dr. Schliemann lived and lodged his visitors. It would be hopeless to try to describe all that is to be seen about the site without large extracts from books, and confining myself to actual impressions, it must in truth be said that to an ordinary traveller the place is somewhat bewildering, and appears very much easier to understand when looking at Dr. Schliemann's illustrated accounts of it than it does upon the



Spoils from Hissarlik.

spot; for when going about among the irregular-shaped cuttings and pits (some of them as much as fifty feet deep), it is not just a question of taking in a ground-plan, or even of several plans arranged as we are accustomed to see them, for the remains of the many cities which have successively occupied the site do not lie in anything like regular strata, but have become apparently so inextricably intermingled, from destruction by fire, ancient digging for foundations, and modern investigations, that it requires not only leisure, but considerable knowledge and imaginative power, to grasp the "Tale of Troy" as told by its latest narrator. But that at least four or five distinct epochs of ancient civilisation are there represented is plain even to the uninstructed eye from the masses of pre-historic walling, both of huge sun-dried bricks and of various kinds of masonry, still to be seen *in situ*, and from the numerous, though much-scattered, fragments of limestone and marble columns and entablatures, the workmanship of which attests both Greek and Macedonian, as well as Roman influence. Equally too are the many generations of ancient inhabitants and the varied character of their arts displayed by the immense quantity of pottery and terra-cotta with which all the ground is thickly sown, not only in the mound itself, but for several hundred yards back over the table-land also, but, unfortunately, generally in the condition of tiny shards of plain ware, so that only by long and diligent search could any pieces with distinct patterns be discovered, in spite of the encouragement given by Dr. Schliemann's kind permission to carry off any of our "finds." Some of these fragments are drawn here, but as they are mostly of late, *i.e.*, not "Homeric" date, our host did not care to say much about them. The one he thought most characteristic and worth preservation is the little "whorl" of grey terra-cotta, with a hole through it, which he pronounced to belong undoubtedly to Priam's Troy, where it was, probably, used as a weight in the process of spinning, though the same form was also multiplied for votive objects. The piece in the middle was apparently the bottom of a bowl, and is decorated with boldly-drawn representations of swans, put in with broad strokes of the brush with dark brown for the heads and reddish brown for the bodies on an unglazed ground of pale "light-red." On the left is a portion of a narrow straight-sided vase painted with bands of vine-leaves and grapes, and with a chequer pattern. Of the dates of these two I cannot speak with certainty, but the piece of the side of a cup with wavy lines is said, on good authority, to be pre-Greek, as also may be the portion of a black and buff bowl in the opposite corner; while the little bit with a red spray of ivy, on a ground of exquisite black glaze, looks like Greek work of the 4th century. The eight-leaved rosette is stamped in relief on grey terra-cotta, and was the only thing of the kind I saw there. The lamp is of the ordinary Roman type and fairly perfect. With these relics my reminiscences must end; and, without venturing an opinion as to the positive identity of Hissarlik with "Troy," I may at least say that, after realising the place and its surroundings, it is certainly the spot of all others where the grand legends which cling around the name of Troy take the most tangible and impressive shape. A. S. F.

THE MAIN DRAINAGE OF LONDON:

PROPOSED ADDITIONAL WORKS.

WE have now before us the joint report of Sir Benjamin Baker and Mr. A. R. Binnie, Chief Engineer of the London County Council, on the main drainage question. The subject was referred to them by the Main Drainage Committee of the Council in December, 1889, the Council having by resolution expressed a desire for more information on the question, at the same time instructing the Committee to "secure the services of an eminent civil engineer to join the Engineer of the Council in a thorough examination of the whole sewage system." The engineers were desired to include in their report "an approximate estimate of the cost of taking the whole of the sewage to the sea, in accordance with the recommendation of the Royal Commission of 1884." The "instructions" given by the Committee to the engineers requested them to examine and report upon the operations at the precipitation and settling-tanks at Barking and Crossness, and upon the state of the river and its banks at different periods of the year. The engineers were also instructed to report as to what additional works were needed to supplement the existing main sewers, having regard not only to the present population and area, but to the possibilities of the increase and extension of those factors in the problem.

Now, apart altogether from future requirements, there are present needs of a very pressing and urgent nature which must be satisfied in the first instance. Many of our readers are only too well aware of the danger to health and the damage to property arising from the frequent flooding by sewage of certain low-lying parts of the metropolis, and this notwithstanding the costly relief sewers constructed of late years by the Metropolitan Board of Works. Even if the report of Sir Benjamin Baker and Mr. Binnie did not conclusively show it to be the case, it has been painfully apparent that the capacity of the large trunk sewers of the main drainage system, carried out by the late Sir Joseph Bazalgette nearly thirty years ago, has become inadequate for the requirements of the London of to-day. Concurrently with and as a consequence of the increase of population since Sir Joseph Bazalgette's scheme was carried out, there has been an enormous extension of the area built over, and therefore a corresponding increase in the area of roadways, pavements, roofs, yards, &c. In other words, there has been a very considerable augmentation of comparatively non-absorptive quick-draining surfaces, discharging rain-water so rapidly into the sewers that, in spite of the provision of a large number of storm overflows, floodings occur in some localities whenever there is a heavy rainfall. Not only have basements been flooded by the forcing-up of the contents of the sewers through the house-drains and traps, but the streets themselves have been turned into shallow canals, either by reason of the inability of the over-charged sewers to carry away the surface drainage, or in consequence of the regurgitation of the sewage through the gullies. It may well be that in some cases, where the basements are deep, the house-drain is put in at too low a level with regard to the level of the sewer; but as mistakes of this kind bring with them their own punishment, it is to be presumed that they are usually guarded against, and therefore we conclude that such errors are responsible for but a very small proportion of the damage done by such floodings. The primary and by far the predominant cause of the mischief is the incapacity of the sewers to cope with the sudden demands sometimes made upon them.

It will be asked, Why not separate the rain-water from the sewerage, or, at any rate, prevent as much of it as possible from entering the sewers? This question is referred to by Sir Benjamin Baker and Mr. Binnie in the introductory paragraph of their report. They say that "in approaching the consideration of the vast question of the whole sewerage system of the Metropolis and the state of the Thames as a practical problem," they had "clearly at once to recognise the fact that the general features of the main drainage system were unalterably settled, and must be accepted in the same way as the main lines of thoroughfares have to be accepted, whether quite as we could wish them to be or not." Under these circumstances they say that, as regards the condition of the Thames, they must admit the fact that—

"In the heart of the metropolis a certain amount of sewage pollution is inevitable, and it would be hopeless, as it is happily unnecessary, to attempt to get a chemi-

cally pure river in the lower reaches. And furthermore, to separate the rainfall from the sewage would involve, as Sir Joseph Bazalgette long ago pointed out, 'a double set of drains to every house, and the construction and maintenance of a second series of sewers to every street,' and the cost would probably amount at the present time to some twenty millions sterling. As a practical question, it is no less impossible to deal with the whole volume of mixed rainfall and sewage by huge intercepting sewers and colossal pumping machinery at the several outfalls.

Sewage must therefore continue to be discharged into the Thames at the different storm overflows, and all idea of a theoretically pure river must necessarily be abandoned. For it would, in our opinion, be quite as reasonable to ask for the expenditure of many millions of money in separating sewage from rainfall, and otherwise changing the whole sewerage system of the metropolis, as it would be to expend an enormous sum in attempting to attain, in the lower reaches of the Thames, more than the reasonable state of purity which experience elsewhere and in other rivers has shown to be, as regards health and other important points, practically as good as absolute freedom from pollution."

These, the reporters say, are the "broad practical views" which have guided them in their inquiry, although they say that they have given respectful attention to the opinions of "the many eminent men" who aim at a higher degree of perfection than they (the reporters) think reasonable or expedient "if reference be had to the enormous initial cost at which alone it could be finally and successfully attained."

After describing the course of the existing main intercepting sewers on the north side of the river, which are known respectively as the "northern high level," "northern middle level," and "northern low level" sewers, and run more or less parallel to the river, the report states that for conveying the ordinary dry-weather flow with which they have to deal these sewers may be said to be of sufficient size. But as the middle level sewer in the Bayswater-road is charged in dry weather to 30 per cent. of its total capacity, the provision for rainfall, and for future increase of population, cannot be said to be adequate. The low level sewer, however, is taxed much beyond its power, the measured dry weather flow being equal to 70 per cent. of the *maximum* discharging capacity of the sewer; and, having regard to the frequent flooding complained of in the Isle of Dogs, Poplar, Hackney-wick, and Westminster, it is pointed out that relief for this portion of the system is urgently required; and, indeed, were it not for the thirty-four storm overflows into the Thames the existing state of affairs would be intolerable.

After describing the precipitation works at Barking, the sludge from which is conveyed by specially-constructed sludge-ships, named the *Bazalgette* and the *Barking*, to that part of the estuary of the Thames known as the "Barrow Deep" (see map), where it is stated to be distributed over a length of some eight or ten miles "in what is practically the open sea," the report goes on to speak of the main drainage system on the south side of the Thames.

The main drainage of the metropolis on the south side of the river is effected, like the drainage of the northern side, by three large intercepting sewers and their branches, known respectively as the southern low level, the southern high level, and the Effra branch sewers. The new precipitation works at Crossness, begun by the Metropolitan Board in 1888, at a total cost of about 330,000*l*., are now approaching completion. Although the works cannot be fully brought into use until about the end of the present year, about sixteen million gallons of sewage per day are now chemically treated at Crossness. The reporters describe the chemical treatment at present adopted, and remark that they are not prepared to say that the present treatment of the metropolitan sewage must be considered as final, and insusceptible of future improvement, nor that it is the only process for effecting the desired end. At the same time they advise the Council without hesitation to continue the operations now being carried on, as a great improvement in the state of the river will assuredly result, when the entire volume of sewage flowing from both the north and south sides of the Thames is chemically treated and precipitated at Barking and Crossness.

This optimistic view of Sir Benjamin Baker and Mr. Binnie is somewhat discounted, it appears to us, when they go on to say, a little further on, that, in considering the present condition of the river Thames, it is, in their opinion, essential to direct the most serious attention to the constantly increasing abstraction of upland waters by the various water companies, which they consider to be a potent cause of many of the grievances complained of in the middle and lower reaches. They point out that the greatest quantity of water is abstracted from the river during dry weather, when the volume of water coming down the river is less, and when the condition of the river near the sewage outfalls is at its worst. They say, however, that they feel confident that the discharge into the Thames at Barking and Crossness in the future of a large volume of effluent will not be productive of any practical evils, but the *maximum* quantity that can be so discharged with impunity must be a matter for further experience. The balance not discharged at the present outfalls must be conveyed by new outfall sewers to some other suitable point lower down the river.

It is next pointed out that the most urgent present requirements are the prevention, as far as possible, of floods due to rainfall; and the cessation of the discharge of crude sewage into the river during periods of comparatively small rainfall and during the first portions of heavy falls. No system of flood relief sewers could be constructed within reasonable limits which would be capable of dealing with the heavy rainfall occasionally poured down upon the metropolitan area.

As before remarked, the low level sewer on the north side of the Thames is taxed far above its present capacity, and it discharges crude sewage too frequently into the river. Any new sewers constructed to supplement the existing ones should as far as possible, says the report, be made to discharge by gravitation in order to avoid the expense of pumping. As the present outfalls from Old Ford to Abbey Mills can only discharge 22,000 cubic feet per minute, they should be enlarged so as to enable them to carry forward at least 44,000 cubic feet per minute. This could be effected by constructing in addition to the two sewers already existing two others of equal capacity. Although the excess escaping into the Lea would be considerably reduced by the construction of the proposed sewers, it would still amount, in times of very heavy rainfall, when the three sewers were discharging their full volume, to 8,000 cubic feet per minute as compared with the present 17,000 cubic feet, but nearly all the small very offensive discharges would, it is asserted, be prevented altogether.

The reporters say that they are of opinion that some provision should be made at no distant date for taking into the Metropolitan system the flow from Tottenham, West Ham, Stratford, and the lower part of the Lea Valley.

As on the north side, so on the south, it is obvious, say the reporters, that any new sewers which may be proposed should, as far as possible, discharge by gravitation; but as a considerable portion of the flow from the present southern high-level and Effra branch sewers will require accommodation in the new sewers, owing to the insufficient size of the southern outfall sewer, this desideratum cannot be completely realised. Under these conditions, they consider that the most generally advantageous course would be to construct a new southern outfall sewer at about the same level as the existing one, extending from Greenwich and Deptford to Crossness, having a discharging capacity of 19,000 cubic feet per minute. At its commencement one branch sewer would connect with the present pumping station and southern outfall sewer at Deptford, and another one with the southern high-level and Effra branch sewers at Deptford-broadway, on the west side of Deptford Creek. In addition to the above new outfall sewer they consider that to improve the drainage and prevent floodings in the Beckenham, Dulwich, Lower Norwood, Streatham, Balham, and Brixton districts a new high-level sewer should be constructed which, draining the districts at greater altitude, would also tap and discharge the flow in ordinary rainy weather of the waters brought down by the old Falcon Brook stream, the upper part of the Effra, and the flow as far as possible of a portion of the Ravensbourne Valley. The discharging capacity of the sewer should be equal to about 19,000 cubic feet per minute, consequently were this and the proposed new outfall sewer constructed, the total discharging capacity at Crossness would be 57,000 cubic feet per minute as compared with 19,000 cubic feet per minute at the present time,—or, say, more than 510,000,000 gallons per day as compared with 170,000,000 gallons. The suggested new system of sewers would be capable of discharging a flow off the ground of over one-third of an inch of rainfall per twenty-four hours over the 60 square miles of drainage area, and at the same time would accommodate the *maximum* discharge of sewage at any hour of the day due to the proportion of the total increased population of about 7,000,000 which may be anticipated to reside on the south side of the river.

The total cost of the proposed works is stated to be approximately as follows:—Works on the north side of the Thames.—New outfall sewer, Old Ford to Barking, 620,000*l*.; new intercepting sewer, Paddington to Old Ford, 245,000*l*.; separation of Isle of Dogs and Hackney branches, including pumping-engines, 55,000*l*. Total, 920,000*l*. Works on the south side of the Thames.—New low-level sewer and branches from Deptford to Crossness, 427,000*l*.; new high-level gravitation sewer, Dulwich to Crossness, 784,000*l*.; engines and buildings at Crossness, 89,000*l*. Total, 1,300,000*l*. Total for both sides, 2,220,000*l*.

For present purposes, therefore, says the report, it may be assumed that the probable cost of supplementing the existing main-drainage system, to enable it to meet present and future requirements, will be about 2¼ millions sterling, exclusive of any cost which might be incurred in carrying the whole or a part of the sewage discharge farther down the river or to the sea. It would, of course, not be necessary to carry out the whole of these works at once.

The engineers also discuss the question of new outfall works, upon which they think it prudent to defer an ultimate decision. One of these outfalls would extend from Barking to Shell Haven, a distance of twenty-two or twenty-three miles (see map). The cost of this outfall is estimated at 1,600,000*l*. Another proposal is to go to the Maplin sands, upwards of fifty miles from Barking (see dotted line on map). The cost of 53¼ miles of outfall sewer and works, including a tunnel under the river from Crossness (to take the sewage of the south side), engines, buildings, and outfall works to discharge the crude sewage into deep water, would, they estimate, be not less than 8,000,000*l*. To this, of course, would have to be added the cost of pumping 280,000,000 gallons per day, which, on the basis of actual expenditure at the existing pumping-stations, but with improved machinery, would entail a probable annual charge of 80,000*l*. The estimate of 8,000,000*l*. may appear large, say the reporters, but it is in accord with previous estimates by other engineers and contractors.

In summarising their report and conclusions, Sir Benjamin Baker and Mr. Binnie say:—

"We have found on investigation that the most frequent cause of public complaint is due to the insufficient size of the main outfall sewers, which has led to floodings of the low districts and to the frequent discharge of much crude undiluted sewage into the Thames in the heart of the metropolis.

To remedy these immediate pressing evils, we have proposed the construction of new intercepting sewers on both sides of the river of sufficient size to provide for the sewage of a future population of 7,000,000, and also for a reasonable amount of rainfall, at a cost of about two and a quarter millions.

We are of opinion that detailed plans should be prepared of these works, and that no time should be lost in commencing such portions of them as are more immediately required.

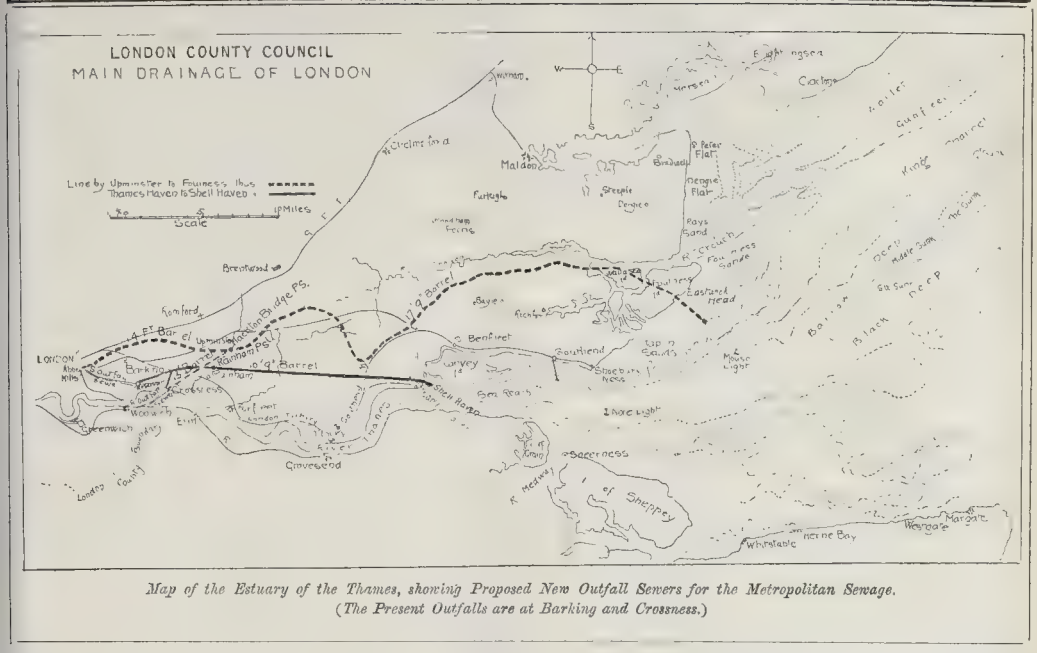
We do not think that the same urgency exists as regards the removal of the present outfalls to some point lower down the river or to the sea.

Having reference to the evidence given before the Royal Commissioners in 1883-4 and to the results of our inquiries and investigations generally, we have been led to the opinion that no new works should be entered upon until the precipitation works at Crossness as well as at Barking have been completed and in operation for a sufficient length of time to enable their effect upon the condition of the river to be ascertained beyond dispute or speculation.

Without anticipating what the exact results of that experience may be, we would point out that the removal of the solid impurities by precipitation must necessarily do away with many of the evils most seriously complained of by the Royal Commissioners in 1884, and we have little doubt that a large volume of the effluent water may continue to be discharged with impunity at Crossness and Barking. During the past half-century the river has never been free from sewage pollution, and experience has shown that, provided such pollution be kept within reasonable limits, no practical inconvenience results therefrom. We have seen nothing in past experience which would justify any alarm at the present state of affairs, or necessitate immediate action without waiting for the results of the completed works at Crossness and Barking outfalls.

We have concluded, however, that the whole of the future sewage should not be dealt with at those outfalls, but that an outfall must be found for a portion of it at a lower point in the river, where the effluent may find its way more directly to the sea.

After a most careful consideration of the question, we have reluctantly come to the conclusion that there is no point in the estuary of the Thames, or on the Essex coast near thereto, where the whole volume of the future sewage could be discharged in a crude condition without risk of returning up the Thames and


LONDON COUNTY COUNCIL
MAIN DRAINAGE OF LONDON
Line by Upminster to Fauness thus
Thames Haven to Shell Haven
Scale
Miles
Barking
Crossness
Shell Haven
Sheerness
Isle of Sheppey
Margate
Whitstable
Herne Bay
Maldon
Southend
Gravesend
Erith
Woolwich
Greenwich
Deptford
Romford
Brentwood
Benfleet
Leigh
Foulness
Eastward Head
Nore Light
Barrow
Black
Middle Sunk
Sea Reach
Long Reach
Halfway Reach
Yantlet Creek
Four Fathom Channel
Queen's Channel
Barrow Deep
Knock John Fort
Maplin Sands
Kentish Knock
Gunfleet
Kirby
Clacton
Walton
Frinton
Holland
Dengie Flat
Bradwell
St Peter Flat
Rays Sand
Foulness Sand
Shoebury Ness
Mouse Light
Middle Ground
Tongue
Red Sand
Girdler
Swin
Spitway
Horse Sand
Barrow Deep
Sea Sunk
Deep
Black
Barrow

Illustrations.

ARCHITECTURAL COMPOSITION; ATTRIBUTED TO BRAMANTE.

THIS is the design which was referred to by Mr. H. H. Statham (page 111, *ante*) in the course of the discussion on Baron de Geymüller's paper at the Institute a few weeks ago. As there described, it is interesting as a Renaissance study of an architectural composition which is symmetrically arranged in regard to general mass but differing entirely in the treatment of the details. The heights of the main cornices are obviously intended to correspond approximately, with a view to symmetrical effect, though their treatment is different; and the lower story is colonnaded on one side and vaulted on the other.

It is reproduced from an old print in the British Museum. There are two copies of this view, and one showing the view from the opposite side, which does not differ much from this. It appears probable that the engraving itself is not one of Bramante's own work; but in all probability it represents a design of his, being so labelled in the half-effaced inscription at the top of the plate.

CHELSEA POLYTECHNIC INSTITUTE.

WE give this week the perspective view and the two principal plans of the design selected in competition for this building, by Mr. J. M. Brydon. We described the design and plans at some length in our notice of the competition drawings in the *Builder* of last week (p. 202); for the rest the design and plans speak for themselves, as to the arrangements and the architecture.

The front is intended to be carried out in red brick, with stone for the window-dressings, cornices, pilasters, &c., to correspond with the public library next to which it is to be built, and which is by the same architect.

VILLAS, DYNAS POWIS.

THESE villas are now in course of completion, on a very pleasant site on the new road made to Barry from Cardiff, close by the new Dynas Powis Railway Station. They are set back 150 ft. from the road (having a south-east aspect), with walls of stone and brick, obtainable in the neighbourhood, faced with hammer-dressed Westra (local) stone, all the mouldings, jambs, arches, lintels, sills, &c., being executed in Corsham Down stone, from the Bath stone firms. The quoins at the angles of the building are of pressed buff bricks, and the whole is jointed in black mortar. The roofs are slated, and have deep overhanging eaves of 18 in. projection, with feet of rafters wrought and cut and boarded on top.

The half-timber work is framed together with projecting oak-pins, and will stand out slightly from face of cement when finished.

The halls and passages will be tiled with encaustic-tile pavements and the kitchens with plain tiles. The hall-doors and fanlights, with cut and moulded heads, will be filled in with leaded lights of various tints. In addition to the rooms shown on the plans, provision is made for six bedrooms, bath-room, drying-room and box-room, and other conveniences.

The works are carried out from the designs and under the superintendence of Mr. W. H. Dashwood Caple, of Cardiff. Mr. R. Jones of Cardiff is contractor for excavating, bricklaying, drainage &c.; Messrs Alexander & Co., of Cardiff, for joinery; Mr. W. Rees, of Dynas Powis, for carpentry and fittings; Mr. W. H. Allen, of Cardiff, for plumbing. Messrs. Morrell's ash-sifting earth-closets are to be used for servants' conveniences: special drainage arrangements are made for the w.c.'s in the houses.

The total cost when finished is estimated at 1,750*l.*

ANCIENT COPED STONES, CORNWALL.

THE illustrations of these are from drawings by Mr. Arthur G. Langdon, and were originally made to illustrate a communication on the subject read to the British Archæological Association in November last. The following *résumé* of this paper will be of interest in connexion with the illustrations:—

"Having briefly introduced the subject, Mr. Langdon gave a list of the coped stones at present known in Great Britain. The numbers, so far as he had ascertained, were thirty in England, ten in Scotland, two in Orkney, and one in Wales, there being none known in Ireland or the Isle of Man. In examining the geographical distribution of the Hiberno-Saxon monuments in England, an interesting fact was disclosed—viz., that the three examples in Cornwall were the only ones to be found in the West of England, for, with the exception of one in Kent and one in Sussex, the rest were confined to the north and north-east districts, and were unknown below the Midland counties. Following this came some general remarks as to the origin of these monuments, several different kinds being mentioned. Mr. Langdon then proceeded to describe each of the Cornish examples separately, two of which were to be seen in the churchyards of Lanivet and St. Tudy—both near Bodmin; and the third in the churchyard at St. Buryan—between Penzance and the Land's End, all three being executed in granite. The Lanivet stone was the best, and in an excellent state of preservation; it was boat-shaped, with a cable-moulded ridge, and hipped ends, on which were beasts in a sitting position, their backs forming the hips of the stone. This example, which measured 7 ft. 7 in. long, was richly ornamented, the sides and coped portion being covered with diagonal key patterns; the only other monument having a similar design upon it, was a cross at Penally, Wales. On the ends of the tomb were interlaced knots.

The St. Tudy stone was next taken, which it appears was, up to a comparatively recent date, deeply buried in the churchyard until discovered by some workmen in 1873, who, in removing the accumulated rubbish consequent on the restoration of the church, accidentally exposed the top of it. It was not, however, thoroughly examined until the spring of 1889, when it was then raised up to the level of the ground. On inspection it proved to be a very fine example, 7 ft. 1½ in. long, and of a unique shape,—wedge-like in form, with hipped ends. The ornament in the south slope of the top consisted of debased foliated scroll-work, while on the north slope there was a curious panel, composed of a four-cord broken plait, combined at one end with a square key pattern. Rude arcading decorated the sides,—there being five bays on one side and six on the other, with an upright stalk and leaf in the spandrils between each. On the wider end a triquetra knot, and bead-work on either of the perpendicular surfaces below, but there were no animals.

The third and last, at St. Buryan, was stated to be only a fragment, 2 ft. 7 in. long, which he found by accident amongst a miscellaneous heap of carved stones that had been piled against the tower after the restoration of the church. The fragment was part of a boat-shaped tomb, but was in such a mutilated condition that only a small piece of diagonal key-pattern ornament—like that on the Sancreed crosses—was now distinguishable, and that this one was included in his paper, since it completed the series of those known in Cornwall."

COMPETITIONS.

CHURCH INSTITUTE AND SCHOOLS, HIGHER TRANMERE.—In a recent competition for a Church Institute and Schools, Higher Tranmere, Cheshire, Mr. J. Berrington obtained the first place, Mr Chas. R. Chidson the second, and Mr. Charles Wise the third. The accommodation to be provided was a hall to seat 500 persons, with class-rooms for about 150 children, and the sum to be expended 1,500*l.*

THE LONDON COUNTY COUNCIL.

A SPECIAL meeting of the London County Council was held on Friday, the 13th inst., in the County Hall, Spring-gardens, the Chairman, Sir John Lubbock, presiding.

The Water Question.—After considerable discussion, it was resolved, on the recommendation of the Parliamentary Committee,—

"1. That the opposition to the London Water Commission Bill be continued, and that the Metropolis Water Supply Bill be opposed

2. That in the event of these Bills being referred to a Select Committee, we should be instructed to intimate to the Committee on behalf of the Council that this Council approves the principles indicated in this report, and is prepared to undertake the question of the water supply of London subject to the following conditions:—That powers should be conferred on this Council for the introduction into Parliament of Bills dealing with the water question, including the establishment of a new supply, and the improvement of the existing supplies, should further investigation prove such a course to be desirable, and that the Chairman of the Council be requested to introduce into Parliament a public Bill with this object, with the view of its being referred to the same Committee as the several pending Water Bills.

3. That copies of this report be sent by the Clerk of the Council to each Vestry and District Board in the Metropolis in sufficient numbers for distribution."

* We will give a *résumé* of the report next week.

The ordinary weekly meeting of the Council was held on Tuesday last, Sir John Lubbock again presiding.

The Late Sir Joseph Bazalgette.—The Chairman said he had no doubt that the members of the Council had seen with regret the announcement of the death of Sir Joseph Bazalgette, who was for so many years the Chief Engineer of the body of whom they were the successors. He felt sure that it would be their desire that an expression of their condolence with the family of Sir Joseph should be given. This was agreed to unanimously.

Revision of Salaries.—A great part of the time of the sitting, as well as of that of the special meeting on the 13th inst., was taken up with a wrangle over proposed increases of salaries. Amongst the increases agreed to on Tuesday was one to Mr. Harper, the Assistant Valuer, from 350*l.* to 400*l.*; and one to Mr. Dibdin, the Chemist, from 600*l.* to 700*l.*

The Blackwall Tunnel.—The Bridges and Parliamentary Committee, to whom jointly was referred a year ago the consideration of certain questions relating to this project (which the Council has since practically decided to carry out, as we stated in our issue of the 28th ult., p. 170), now reported, recommending as follows:—

"(1) That no steps be taken to obtain modifications of the existing powers as to works.

(2) That it is not expedient to apply for a Bill containing provisions as to the method of providing for the future expense of carrying out the works and approaches of the Blackwall Tunnel which should throw any charge upon the property adjoining the present approaches for benefits conferred not under the Act by which the charge is to be imposed, but for benefits conferred in consequence of the execution of the works and approaches under the Act of 1887."

These recommendations were agreed to.

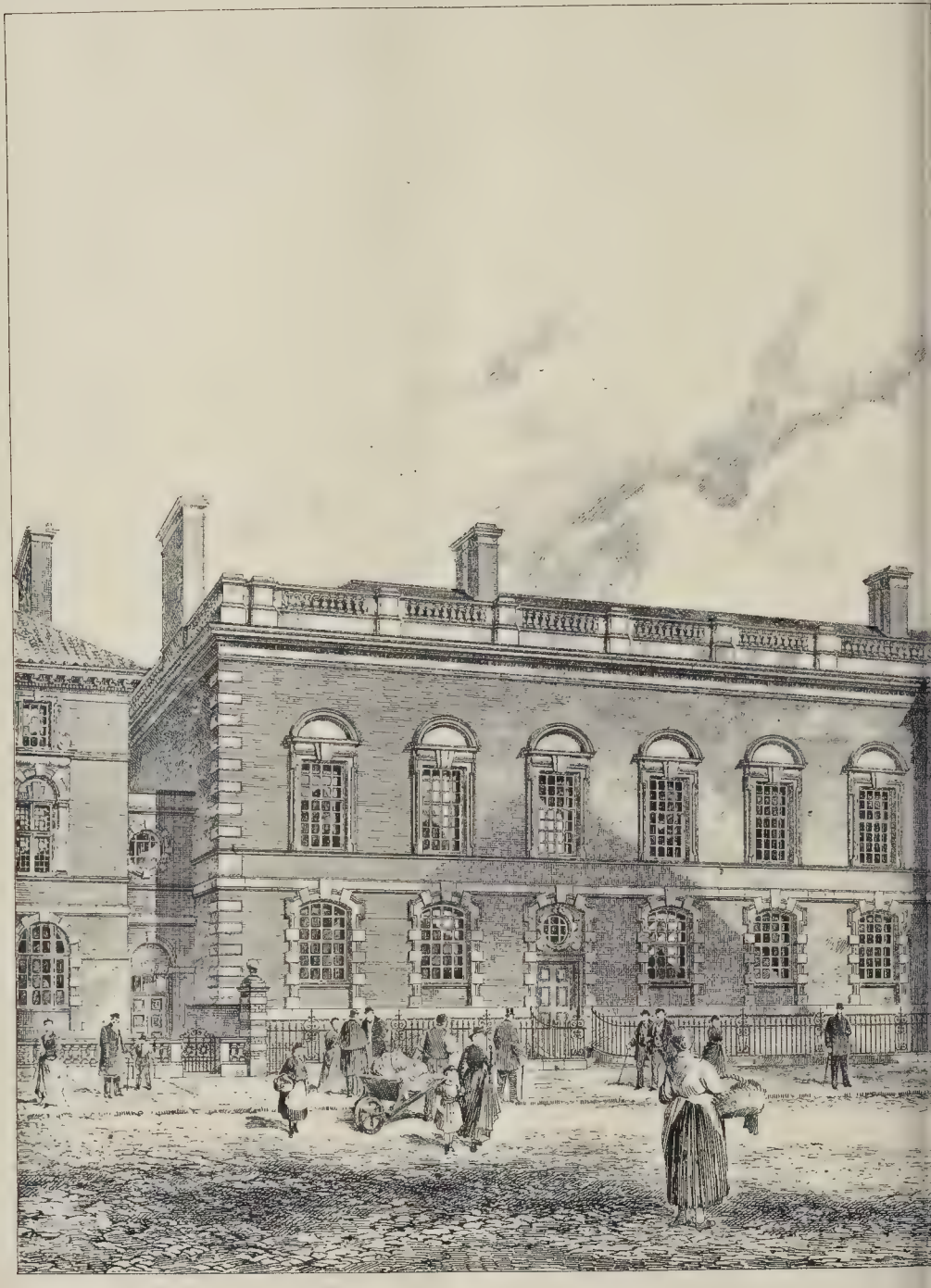
On the report of the Special Committee on Contracts being reached, the Council was counted out just before 8 o'clock.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—A lecture under the auspices of this Society was delivered at the Law Institute, Albion-place, on Tuesday evening last, by Mr. G. F. Charnock, Lecturer on Engineering at the Bradford Technical College, entitled, "Some Recent Practice in the Design of Ironwork for Buildings." There was a good attendance of members, and Mr. Charnock's clear and lucid manner of explaining his diagrams as they were thrown upon the sheet by the lantern enabled everyone to follow the lecturer with great interest. At the close of the lecture a vote of thanks was proposed by Mr. Buckley, and seconded by Mr. Hall and carried. The President of the Society, Mr. W. H. Thorp, F.R.I.B.A., at the commencement of the evening, spoke of the loss the Society had sustained by the death of one of their members, Major Moore, and proposed a vote of condolence with his widow. Mr. Balmer seconded the motion, which was carried.

MANCHESTER ARCHITECTURAL ASSOCIATION.—The last ordinary meeting of this Society was held at the Diocesan Buildings, Manchester, on Tuesday, Mr. T. Chadwick, President, in the chair. The following gentlemen were elected as officers for the coming session: President, Mr. T. Chadwick, A.R.I.B.A.; Vice-Presidents, Messrs. J. D. Mould, A.R.I.B.A., and P. Hesketh, A.R.I.B.A.; Treasurer, Mr. A. H. Davies-Colley, A.R.I.B.A.; Librarian, Mr. J. S. Hodgson; Registrar, Mr. J. H. Woodhouse; Secretary, Mr. J. D. Mould; Committee, Messrs. P. E. Barker, A.R.I.B.A., E. Hewitt, A.R.I.B.A., E. P. Hinde, A.R.I.B.A., F. W. Mee, W. E. Potts, A.R.I.B.A., F. B. Smith, H. E. Stelfox, A.R.I.B.A., and G. H. Willoughby. Mr. Edgar Wood read a paper on "An Architect's Study of Colour." A discussion followed, in which Messrs. Hill, Hesketh, Potts, and Mee took part.

EDINBURGH ARCHITECTURAL ASSOCIATION.—This association met on the 12th inst. under the presidency of Mr. W. W. Robertson. The Chairman referred to the death of Mr. Dick Peddie, and moved that the secretary be instructed to convey an expression of sympathy to the members of his family. Mr. G. S. Aitken seconded the motion, which was adopted. Mr. Archibald Macpherson, architect, read a paper on "Some elements of design," in continuation of a former paper dealing with supposed theories of proportioning buildings in Mediæval times, and bringing his enquiries down to the beginning of the seventeenth century. In the plaster



CHELSEA POLYTECHNIC INSTITUTE: S

PERSPECTIVE VI



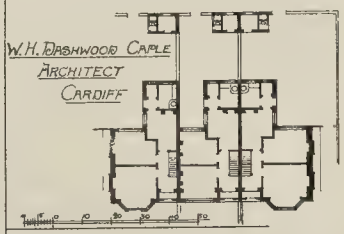
PHOTO-LITHO PINCHES & CO 32 MAIDENS LANE CLERKENWELL ST LONDON E.C

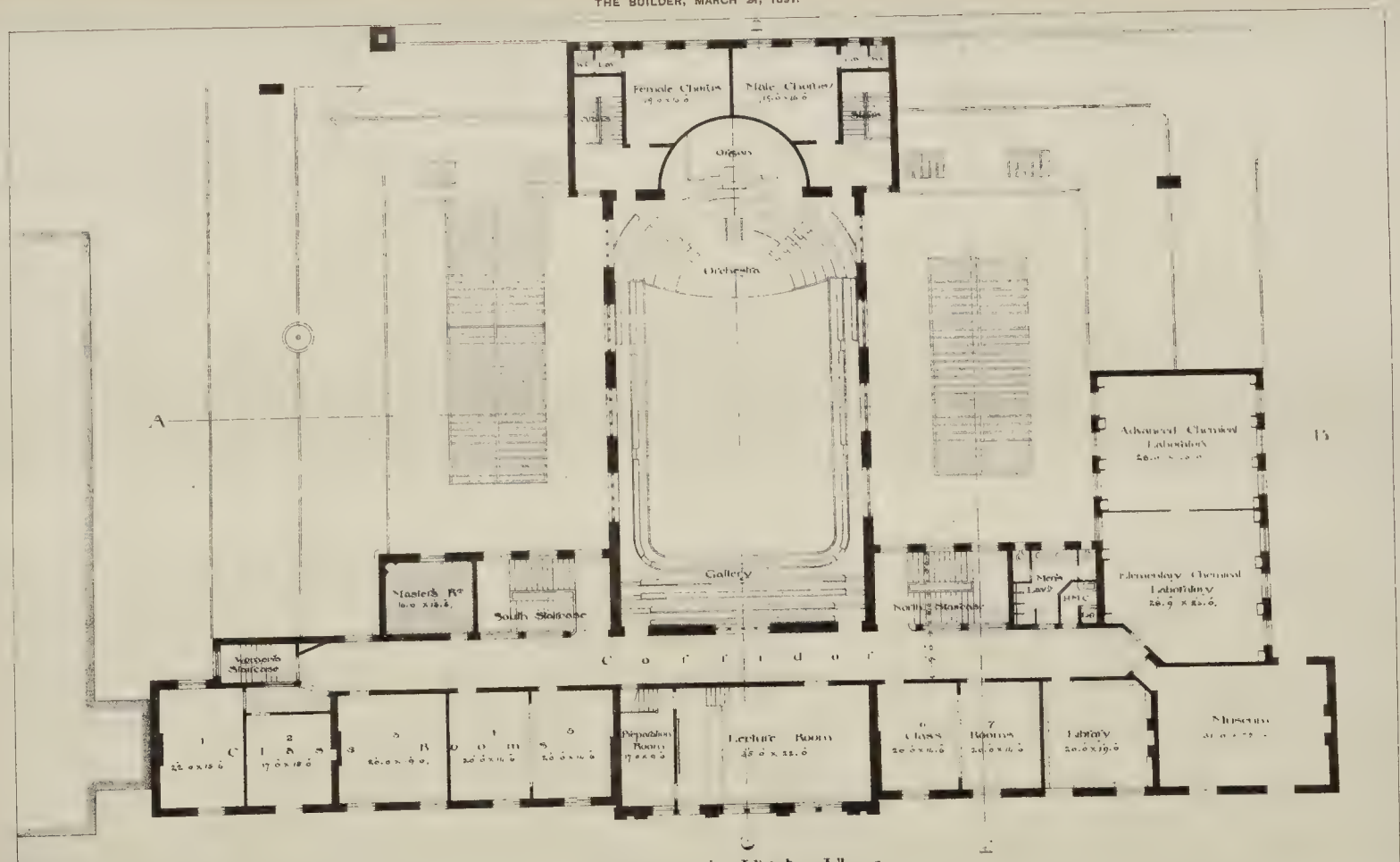
IGN.—Mr. J. M. Brydon, F.R.I.B.A., Architect.

10 MANRESA ROAD.

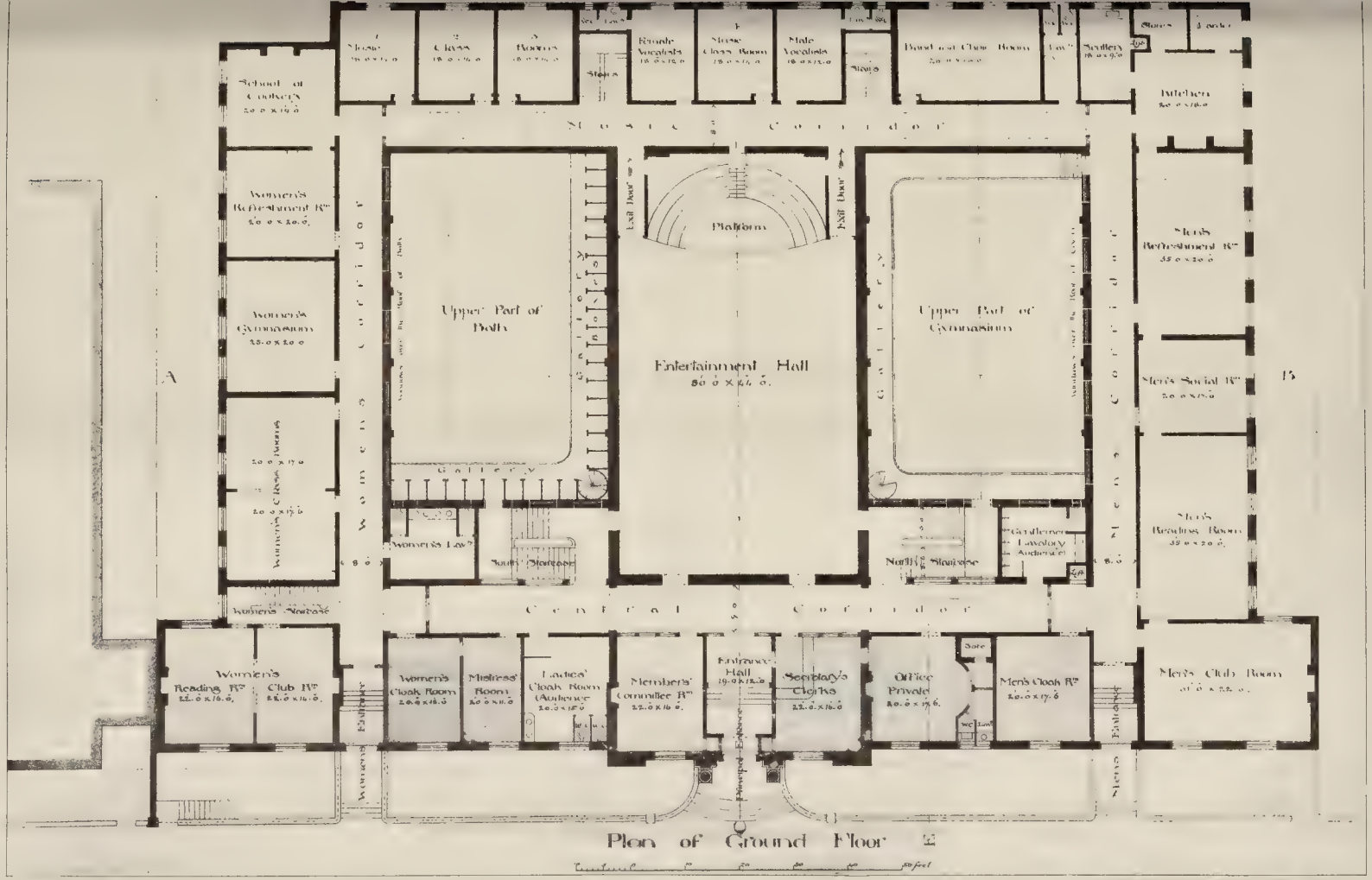
THREE VILLAS AT DYNAS POWIS NR CARDIFF.

W. H. DASHWOOD CAPLE
ARCHITECT
CARDIFF

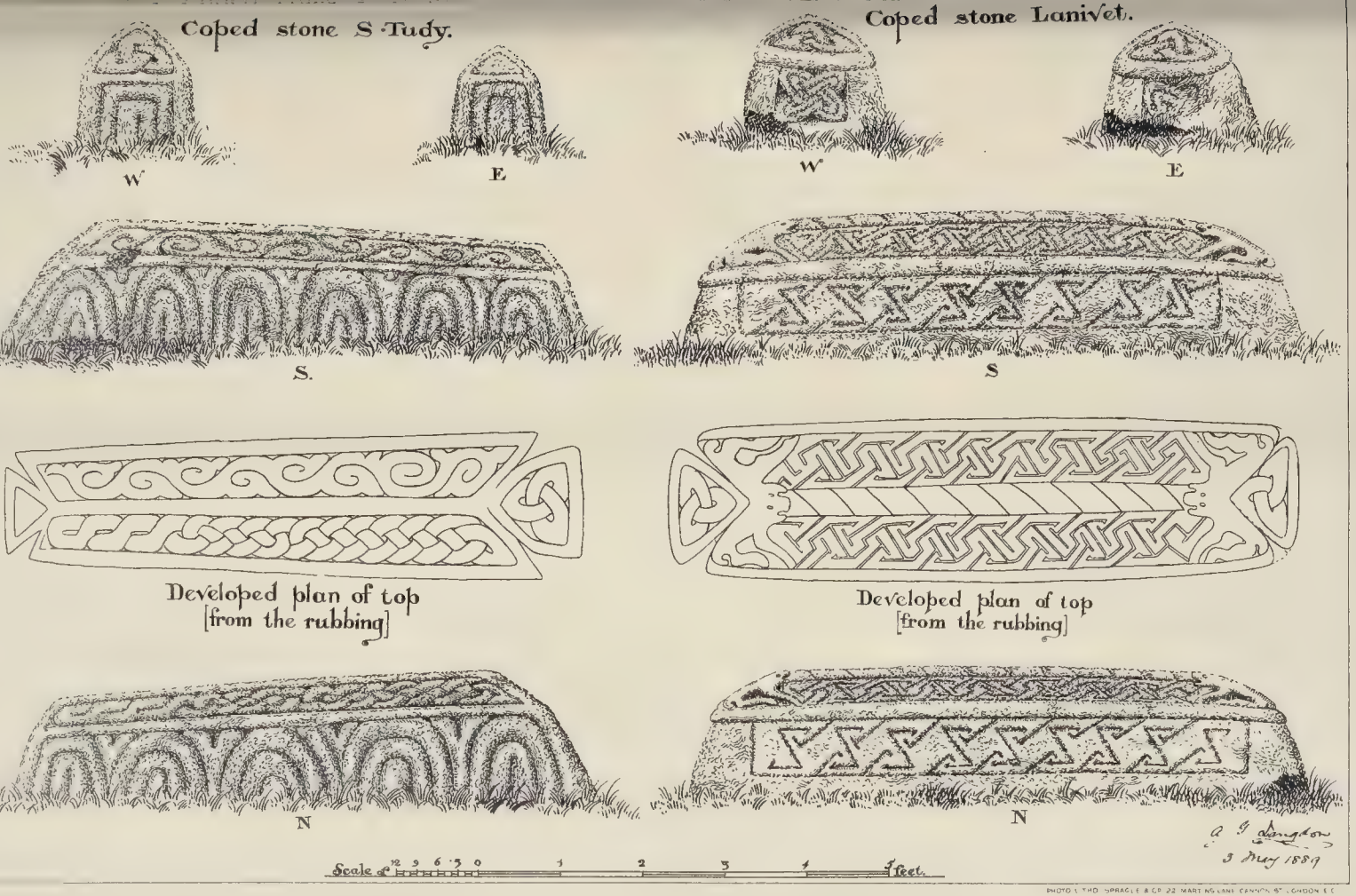




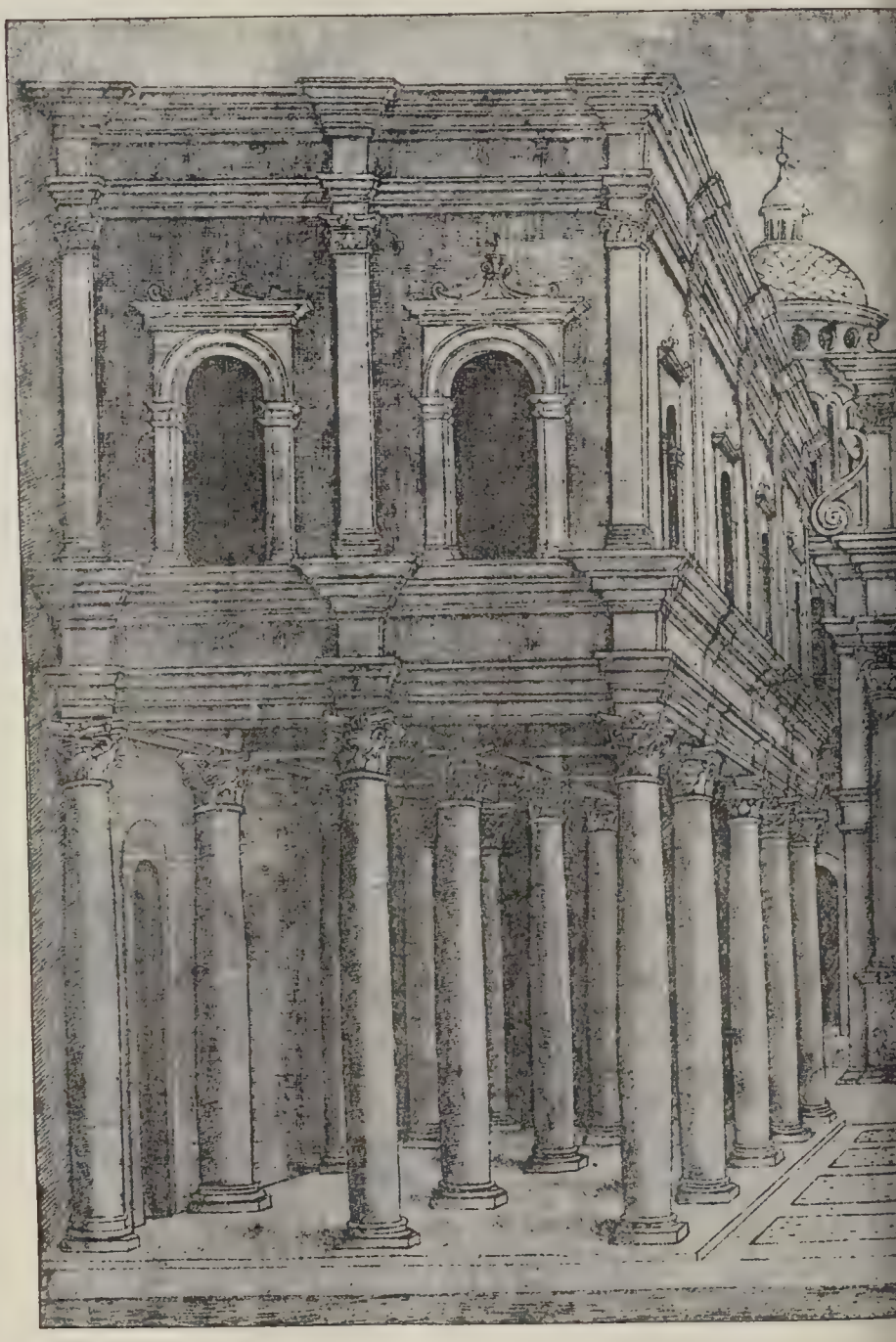
Plan of First Floor



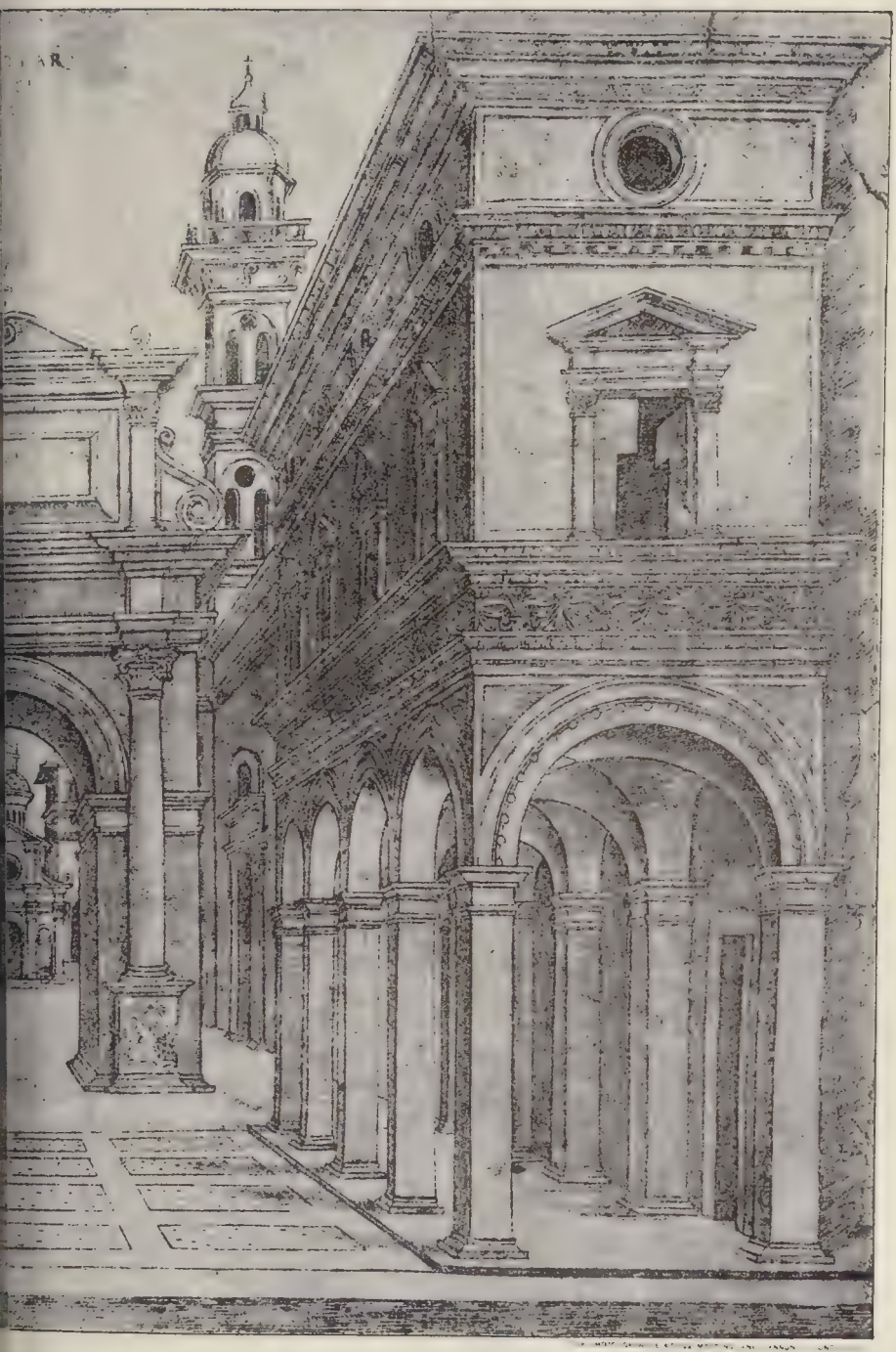
CHELSEA POLY-TECHNIC INSTITUTE SELECTED DESIGN.—Mr. J.-M. Brydon, F.R.I.B.A., Architect.



ANCIENT COPED STONES IN CORNWALL.—Drawn by Mr. Arthur G. Langdon.



ARCHITECTURAL COMPOSITION: ATTRIBU



TE.—From a Print in the British Museum.

ailings of these times there was some evidence design having been set out on a geometrical asis. He concluded by urging the study of he proportions of old buildings by some method uch as an application of geometric figures, hich would enable the character of the proortions to be easily distinguished.

Dundee Institute of Architecture.—he fourth ordinary meeting of the Dundee nstitute of Architecture, Science, and Art, was eld on the 12th inst., when a lecture on Modern Church Architecture," was delivered y Mr. John Kinross, President of the Edinburgh Architectural Association. Mr. Charles wer, A.M. Inst. C.E., the President of the nstitute, occupied the chair. Mr. Kinross, at he outset, compared modern with old church rchitecture. It would be absurd, he said, to ssert that old work, if not strong, was eautiful, because some was positively ugly; ut at the same time there was a large amount f their old ecclesiastical work which was rand and beautiful. It remained with them, they were to hold their own with it, to try nd excel in design, and to gather round them school of higher craftsmen, who would throw eir skill into intricate moulding work, eautiful carving, decorative colour, and all the ther work that goes to make a monumental uilding.

SURREY ARCHÆOLOGICAL SOCIETY.

The annual meeting of this Society was eld at 8, Danes Inn, Strand, on Wednesday fternoon, the President, Lord Midleton, in he hair. The Council submitted their thirty-sixth nnual report, together with the cash account nd statement of assets and liabilities to ecember 31, 1890. The report mentions that n afternoon meeting of the Society was held t Wimbledon, on Saturday, June 14, under the residency of Viscount Midleton. The Church, he Camp on the Common, and Eagle House, he residence of T. G. Jackson, Esq., F.S.A., ere visited, and papers read on the same. The nnual excursion took place on Wednesday, uly 23, under the presidency of Major Alfred eal-s, F.S A, when the Society visited Little ookham Church, Great Bookham Church, "Fair-eld," once the residence of Madame d'Arblay, also the village of Great Bookham; Slyfields Manor ouse, and Stoke d'Abernon Church and anor * Part I., vol. X., of the "Transacons" was issued to members in June last. he concluding part of the same volume is ow in the press, and will shortly be issued. he number of members is now, 314, viz.:— nnual, 215; life, 95; honorary, 4. During the ear 34 new members have been elected, viz.:— 8 annual and 6 life. By death, the Society as lost 8 members, viz.:—5 annual, 2 life, and honorary. By resignation, 14 members. Gain ver loss, 12. During the year a sum of 50*l.* as been added to the reserve fund, which now onsists of the sum of 389*l.* 16s. 3d. 2⅞ per ent. Consols. A sum of 82*l.* is still due to the eserve fund on account of life compositions eceived during the years 1889-90. The ouncil in their report express the great thanks hat the Society owes to its Honorary Secrearies for the general management of its affairs. everal valuable additions have been made to he Library during the past year. In the next art of the "Transactions" will appear the first nstalment of the Catalogue of the Church Plate f the County. The Society is much indebted o the Rev. T. S. Cooper, one of the Honorary ecretaries, for much patient labour and esearch in compiling the same. A circular elating to the Archæological Survey or Map f the County has been issued to all Members he Council desires to point out the great mportance of this work, and the necessity for he co-operation of all members in order to nsure accuracy. The Society was again represented at the Second Conference of Societies in nion with the Society of Antiquaries of London, held at Burlington House, on Tuesday, uly 15. A valuable report on Parish Registers, nd other details of the Conference, will be rinted in the next part of the "Transactions." The report was adopted, and some formal usiness transacted.

Photographic Society.—An exhibition of collotype printing is announced at the rooms of the Society 50 Great Russell-street Bloomsbury, to open on April 14.

* Reports of the proceedings on both occasion ppeared in the *Builder* at the time.

FREE LECTURES TO ARTISANS AT CARPENTERS' HALL:

PROF. MARSHALL WARD ON "TIMBER: ITS GROWTH AND DECAY.'

The third* of the present series of free lectures to artisans and others was delivered on the evening of Wednesday, the 25th ult., at Carpenters' Hall, London-wall, by Prof. Marshall Ward, M.A., F.R.S., his subject being "Timber: its Growth and Decay."

The chair was taken by Sir J. C. Lawrence, Bart., and there was a good attendance.

Professor Ward, who illustrated his lecture by means of the lantern, referred to the growth of timber, and to the point of view in which it was looked at by the timber-merchant, the carpenter, the chemist, and the botanist. He described in a clear and simple manner the annual growth of the wood, and showed illustrations of transverse sections of common deal grown under different circumstances, that grown in Northern Europe being close-grained, and contrasting with the same species of tree grown in a warmer climate, in which the concentric rings were much wider apart, and the wood soft and woolly. In dealing with the question of decay, he showed an oak with part of its trunk decayed, where a branch had been broken off. The decay in this instance was caused by exposure, whereas, if the fracture had been cut clean off and covered with some protective matter, the wound would often be healed over by the growth of the cambium. Moisture had a great deal to do with the decay of timber; the moisture, if dirty, bringing with it the spores of certain kinds of fungi. At the same time, the decay of trees was not always to be attributed to the action of fungi. Trees often died from the action of acid gases, which killed off the leaves year by year, the leaves being the means of feeding the cambium. In other cases the decay of timber was due to the attacks of fungi, and notably from those of the common toadstool. It had only been discovered of late years by a German botanist that a fungus could, while the tree was alive, destroy its wood by decay The fungus made its way into the roots of the standing timber, and slowly worked up the stem. Many other species of fungi which had hitherto been considered harmless were now known to attack timber, and to be the cause *ab initio* of its decay. The lecturer here exhibited on the screen an illustration of a piece of oak wood, which had been hollowed out as if by the agency of beetles, but which had really been attacked by fungi. Other illustrations of wood attacked by fungi showed that in each case the ravages were of a different character. The dry-rot fungus was in the habit of attacking deal and other woods, causing the surface to crack up, and eventually to crumble between the fingers like powder. At a certain stage of dry-rot, the fungus came to the surface of the wood, especially where there was a damp and warm atmosphere. The action of the dry-rot fungus gradually broke down the thickness of the woody tubes, besides which juices were secreted which had the power of dissolving the substances of which the wood was composed. By this action, the tubes were broken to pieces, and eventually their substance passed into a state of solution. Therefore, although the action varied somewhat in detail, the decay of the timber was caused by the breaking down of the tubular structure of the wood by means of these destructive fungi.

* For brief reports of the previous lectures see pp. 151, 174, *ante*.

PROF. J. M. THOMSON ON THE CHEMISTRY OF BUILDING MATERIALS.

The fourth lecture of the series was delivered on Wednesday, the 4th inst., by Professor J. M. Thomson, F.C.S., F.R.S.E., his subject being "Some Points in the Chemistry of Building Materials," with experiments. Mr. Alfred Preston presided, in the absence of Mr. Charles Barry, F.R.I.B.A., and there was again a large attendance.

Professor Thomson commenced his lecture by dividing the subject-matter under the following heads:—(*a*) Stones, (*b*) Bricks, (*c*) Mortars and Cements. He proceeded then to subdivide the group of materials, such as stones, into hard or silicious stones, as granites, basalt and porphyry; sandstones, where the grains of silicious material are bound together by some slightly cementing material; and soft stones, generally obtained from the limestones, and most commonly employed in the South of England. He pointed out the important part which was played by silica and the silicic acids in the harder varieties of stone, and illustrated by experiments the hard and insoluble nature of the former. He also showed experimentally how the soluble varieties of silicic acid might be obtained, and explained fully the separation of crystalline from colloidal or non-crystalline bodies by the process of dialysis. After showing the insolubility of silicious materials, Professor Thomson spoke of the action of various substances on such hard rocks, and illustrated his remarks by showing the volatility of a silicious compound, viz., silicon fluoride, and demonstrated the action of hydro-fluoric acid, and its use in the decomposition of silicates. To show the difference between the varieties of stone mentioned, Professor Thomson immersed blocks of granite, sandstone, Dolomitic limestone, and marble in baths of weak acid, when the action of the acid on the different varieties of the stone was very apparent, the limestone and marble yielding rapidly to the action. A brief description was then given of the use of the soluble silicates in the manufacture of artificial stone, by mixing fine sand with the silicate, stamping into moulds, and then, when partially dry, hardening the mass in a bath of calcium chloride, which coats, and to some extent penetrates, the stone with insoluble calcium silicate. Reference was next made to the binding effect produced by heating the silicates; and to the conversion of ferrous into ferric compounds in the weathering, and action of air upon the stone. These two points were illustrated by the burning of a white clay brick, which came from the kiln hardened, and at the same time reddened by the conversion of the ferrous carbonate into ferric oxide. Professor Thomson then spoke of the second class of stones or limestones, such as are found at Portland, Bath, Purbeck, Ancaster, and Caen, illustrating how easily they could be decomposed by heat and acids, a portion of limestone being heated and the carbonic acid gas collected. The action of atmospheric carbon dioxide, and its action when dissolved in water, was then shown upon limestone, the soluble bicarbonates formed being rapidly dissolved. Passing from the consideration of the limestones, Professor Thomson pointed out that they naturally led to the consideration of mortars and cements formed from substances provided by the burning of limestones. Under building cements could be considered three distinct divisions, namely, mortar, plaster of Paris, and hydraulic cements. After dealing with the question of lime-burning, and lime-slaking or hydration, he passed to the consideration of the nature of common mortars formed by moist lime and sand, and showed by tables the similarity in composition between ancient and modern mortars. Professor Thomson then spoke of the setting and hardening of mortars, indicating that they may be regarded as two distinct processes, the setting being merely the drying, but the hardening being evidently due to the absorption of carbon dioxide by the dried lime. In connexion with this, the lecturer pointed out the absence of absorption of CO_2 by moist lime, stating that wet mortar absorbed only about 1 per cent. of its weight in a week, still remaining soft; whilst mortar in a drying atmosphere absorbed about 14 per cent. in a day. He pointed out the inadvisability of rapid drying, which has a tendency to powder the material. Apparently the admixture of sand in the mortar is not necessary, but facilitates the conversion of the grains of calcium hydrate into carbonate by separating them from each other. The lecturer then dealt with the production and hardening of plaster of Paris, showing first the dehydration of that substance at moderate tempera ures, and then the absorption of water during the process of hardening. With regard to hydraulic limes or mortars, Professor Thomson showed that they must all be regarded as silicated mortars, and that their power of hardening related very distinctly to the amount of clay in the limestone, pointing out that the quantities ranged from 5·3 to 8·2 in a feebly hydraulic lime, rising through different stages to from 19·1 to 21·8 in a hydraulic lime, but that the limit was reached when the lime contained more than 26·7 per cent. of clay. In conclusion, he pointed out that good cements should contain no free lime, as they should not swell when set; that they probably contain calcium silicates and calcium aluminates; and that during the process of hardening the tri-calcium compounds undergo decomposition, forming hydrated calcic ortho-silicates and aluminates, these forming during the setting of the mortar a mass of crystals of the hydrated compounds binding the whole together.

The fifth lecture of the series was delivered on Wednesday, the 11th inst., by Mr. Thomas Blashill, F.R.I.B.A., who took as his subject "The Carpenter and the House." A report of this lecture is in type, but is unavoidably held over until next week.

The sixth and last lecture of the series was delivered by Professor Banister Fletcher, F.R.I.B.A., on Wednesday evening last, on "Architecture, its Civic and Commercial Value." Sir John Lubbock presided, and there was a good attendance. We hope to be able to give some notes of this lecture next week.

New Font, Carlisle Cathedral.—A new font has been erected in Carlisle Cathedral by Mr. F. W. Pomeroy, London, from the designs of Sir Arthur Blomfield. The font stands in what remains of the nave of the Cathedral, upon two hexagonal steps of coloured marble placed on a square coloured marble floor, with ornamental border. It is of Hopton Wood stone. The bowl is hexagonal in form. In each alternate side there is a groined niche containing a bronze statuette, and the other sides or panels are filled in with tracery. The font is surrounded by an iron canopy, designed by Sir Arthur Blomfield, and executed by Messrs. Starkie, Gardner, & Co., London.

Books.

The Gentleman's Magazine Library; being a classified collection of the chief contents of the *Gentleman's Magazine* from 1731 to 1868. Edited by G. LAWRENCE GOMME, F.S.A., Architectural Antiquities, Part II. London: Elliot Stock. 1891.

THIS is a second volume of the reprint of architectural articles from the *Gentleman's Magazine*, the first volume of which we noticed at the time of its appearance. This volume consists entirely of Carter's articles on the architecture of different periods of English history, with special and lengthy additional notes on some of the English Cathedrals. These are well worth republishing as a record of the view taken of English architecture by an architect and archæologist who in his appreciation of the monuments of the past was far in advance of his own day, and in fact was in a manner the herald and forerunner of that reverence for ancient work which has been in the present day carried to rather an illogical extreme, but which hardly existed in this country at the time when Carter with his protests appeared as a *vox clamantis in sicco*.

Carter's descriptions of Early Gothic buildings are brief and incomplete, and he classes as Saxon what is now known as Norman; the editor inserts a *caveat* as to this. It is not impossible, on the other hand, that some buildings, or portions of buildings, now called Norman may in reality be Saxon; *e.g.*, Waltham Abbey. The amount of insight into the true spirit and meaning of Gothic architecture, however, which Carter shows when he comes to speak of thirteenth-century Gothic, is truly remarkable for a man writing in the "dark ages" of 1810.

"The clusters of columns to all situations are masoned in one solid mass ["masoned" is good] in their several courses without bands, the shafts rising from base to capital in a clear and uninterrupted line. This circumstance of the disuse of bands is thus accounted for; the small surrounding columns project little more than half a diameter from the main central column. The grains present tracery, compartments, &c.; and it should appear that the great aim of the architects at this period was to embellish the faces and lines of their structures in the most brilliant and luxurious manner, as each particular in the interiors was gilded and painted in various colours; a kind of fascinating principle was everywhere afloat to rivet attention, and to claim unceasing admiration. Every decoration had its peculiar grace and peculiar use; accommodation and convenience were ever combined with some ornamental beauty, and some masonic security."

The nomenclature of modern Gothic criticism, it would be perceived, was not fixed yet, but the spirit of Carter's remarks is exceedingly discriminating, nor can we overlook the spirit of enthusiasm which pervades his remarks. When he turns to find all these qualities "nowhere more wonderfully brought upon our view" than in the case of York Minster, perhaps the modern critic will suggest a note of interrogation; but it was not to be expected that in those days the most loving writer on Gothic should have attained to a perception of the finer differences of style, proportion, and detail.

The Tudor-Gothic in its finest examples, King's College and Henry VII.'s Chapel, stirs Carter to still higher enthusiasm: "it is now that a plunge is made at once into a sea of new architectural splendour, and which may perhaps be thought to carry with it more of original or self-devised style than is manifested in any previous composure of the kind, where we always note a progressive line of creation, one rising, as it were, on the disuse of the other." There is much truth in this rather exuberantly expressed criticism, and no doubt Tudor-Gothic was wonderfully fortunate in being worked out in so complete a manner, so undisturbed by the intrusion of any other variety of style, as at King's College. From the Tudor style Carter proceeds to the description of Elizabethan and subsequent buildings; the Temple Hall, Burleigh House (which he finishes off rather briefly), Hatfield House, and so on through a long series of buildings, down to the opening of the Georgian era.

Carter's additional notes are on York and Durham, which he treats at great length, on "Construction in Norman Domestic Architecture," and on "Norman Domestic Architecture," with one or two other subsidiary subjects. In some remarks on the Norman north-west tower of Canterbury, "lately destroyed," he advances a theory about Norman construction which is rather the reverse of that entertained by those who have been concerned more recently in the necessary reconstruction of some Norman and Early Gothic monuments. We have lately been accustomed to speak with astonishment of the constructive carelessness of the Normans and Early Gothic architects in depending on a shell of masonry filled in with rubble. Carter takes the opposite view: He says "the strength of a Norman wall is in its core, when this crumbles and fades away, as in the present instance, the fate of the building is decided. But I question the modesty and justness of any reflection upon the failure, so to name it, of a fabric which has stood full six centuries and a half." Carter evidently regards the rubble and mortar as the real construction, the strong part of the wall, in fact as a kind of concrete (though he does not use that word), only of larger pieces than concrete proper is formed of; the external masonry being merely a decorative architectural facing. His respect for the building which had stood six centuries and a half is somewhat too indulgent, for after all we cannot doubt that if the Normans had built their great piers of solid bonded masonry, and been more particular about the foundations, they might have stood for many more centuries. But the suggestion that the interior portion of their piers was intended to stand as a conglomerate or concrete, depending on the cohesion of the mortar in which the rubble was embedded, and that this mortar has in process of time disintegrated and the centre portion of the pier consequently lost cohesion, is worth taking into account. It is not creditable to the manufacture of the mortar, certainly, but it may suggest the doubt whether after all the Normans were quite so reckless in their intentions and method of building as they have been supposed to have been.

The book generally is one of great interest both for the record contained in it of buildings that have disappeared, and also as a kind of literary monument to a man who was quite ahead of his contemporaries in the intelligent interest which he took in the architectural remains of his country. Of the manner in which his views were regarded at the time an amusing instance is given in the preface, from a letter which appeared in the *Gentleman's Magazine* for 1813, in which the writer says he had inquired at Westminster whether Mr. John Carter, "your occasional architectural correspondent," was among the candidates for the vacant office of architect. The person he addressed did not know, but observed that in any case Mr. Carter "could not be considered an eligible person, from his strong propensity to preserve the works of antiquity unaltered; and besides, he had been heard to declare publicly that if he had a casting vote on the question of rebuilding Henry VII.'s chapel, he would instantly give it for stopping all further proceedings, except repairing such parts as absolutely required it." It is curious to reflect that eighty years ago such sentiments should be quoted as a reproach against an architect.

A Book of Houses. By ERNEST NEWTON Architect. London: B. T. Batsford. 1891.

THE object of this book, which the author has "dedicated, by permission, to his master, R. Norman Shaw, R.A.," is to show what kind of houses of individual type and character people may build for themselves as their own homes, at a moderate outlay. Mr. Newton observes that it "has somehow become an accepted fact that people of moderate means may not even contemplate the possession of a house of their own"; and so they settle down into sets of houses all alike, presenting neither any architectural beauty nor any special character which may suit the special character of each inhabitant. To encourage an emancipation from this state of things, the author gives representations of houses which have been built in or near London at prices varying from 1,400*l.* to 2,200*l.* each. They are each illustrated by two photographs (reproduced by Messrs. Sprague & Co.) and two plans.

As may be expected, the houses belong entirely to one school, which may be characterised as the modern domestic picturesque, in which the use of bay-windows apparently supporting an overhanging soffit or projection is a favourite feature, though this is not indulged in too often in the present collection As may be expected from the prices named, th appearance of the small buildings is not ver solid; there is a little too much of the Bedfor Park type about them. The walls are mostl tile-hung on the upper portion, and how slende a construction may be veiled behind thes tiles we all know. The houses are, however nearly all picturesque and without an kind of pretention unless it be in the rathe emphatic declaration of unpretentiousnes which may itself become a kind of affectation they have, however, an interesting variety o treatment and character within the limit allowed by general similarity of manner. Thi three small windows near the entrance of No. 3 the simple pillared porch of No. 6; the larg segmental bay window of No. 7, appropriatel giving cheerfulness to the drawing and to th nursery over; all these are incidents whic give individual and home-like character and it is almost needless to say that there i nothing in bad taste. The plans have receive careful attention, and are very compact an convenient; in the upper plan of No. 4 it woul have been better to have taken the bath-roo door into the little lobby next the w.c., fo the purpose (which should be aimed at in sma houses even more than in large ones) of maskin the identity of the latter apartment; in on or two other plans this is rather overlooke The size of the rooms, when tested by scal becomes rather Liliputian; drawing-room 15 ft 6 in. by 12 ft. exclusive of small bay window dining-room 15 ft. by 11 ft. 6 in. with simila reservation; kitchen 12 ft. by 10 ft.; backsta 2 ft. 6 in. wide &c. (House No. 4). The eye i deceived at first as to scale by the fact that a external walls, or nearly all, are 9 in. on th upper story. That is of course one way in whic it has been possible to build these pretty an really inviting-looking little "homes" f the small sums named in the preface But we cannot say that in this climat we can regard outer walls 9 in. thick as ade quate for comfort; and then there is th question of durability. When people of littl wealth put their savings into a house of thei own, as Mr. Newton wishes to encourage them t do, they naturally wish to regard their house a a permanent possession to be inherited after wards by other generations. But we fear thes sort of houses with 9-in. outer walls, howeve pretty, are not likely to serve for many genera tions, and the idea that satisfactory residence can be built at so cheap a rate must be take *cum grano*.

We observe that none of the plans have th north and south point marked on them. Thi should never be omitted on a house plan, as th aspect of sitting-rooms forms (or ought to form an important element in the arrangement of plan

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Mixed Metals or Metallic Alloys. By ARTHU H. HIORNS, Principal, School of Metallurgy Birmingham and Midland Institute. London Macmillan.

THIS is a useful little work by a competen and practical writer. Alloys generally hav properties differing from their constituents —sometimes widely so. Some metals, whe mixed to form alloys, evolve heat: others when they unite absorb heat; thus mixture of lead, tin, and bismuth adde to mercury will act like a freezing mixture Professor Spring's experiments on the effect o pressure on different metallic powders are re ferred to; he showed that under a pressure o 2,000 atmospheres, or 13 tons to the squar inch, lead, in the form of filings, became com pressed to a solid block; and under a pressur of 5,000 atmospheres the metal flows throug all the cracks of the apparatus like a liquid Attempts were made to produce alloys by pres sure alone, and there seems to be some ev dence that true union of the metallic particle can be effected in the cold by pressure alone.

The numerous and extremely important series of alloys in which copper forms the leading metal have naturally a large place accorded to them. It is interesting to observe that while traces of foreign metals will often exert an injurious effect upon the copper, yet when these same metals are added in considerable quantities a useful alloy results. For example, 1 per cent of zinc in copper will make it hard and re short, but 20 per cent. of zinc alloyed with 80 pe cent. of copper will produce an exceedingly malleable alloy. The copper-zinc alloys, known as brasses, vary widely in their characters an adaptability to various purposes. Certain varieties of brass are exceedingly malleable and ductile and these properties, combined with the variety

nades of colour obtained by suitable mixing, the moderate cost, render them most valuable ornamental purposes. Brass possesses all necessary advantages as a constructive erial for works of art, and, with the aid of uers, resists the action of the atmosphere arkably well.

he valuable tables on the "Properties of per-zinc Alloys Collated for the Committee Alloys appointed by the United States Board port, Vol. II. 1881)," are a useful feature of work. The peculiar susceptibility of brass ndergo molecular change is illustrated in statement that: Wire-drawers assert that if s wire is annealed directly it has been en off the drum on which it has been wound ing the process of wire-drawing, it will fly ieces. This effect is prevented by subjecting coil of wire, after its removal from the m, to strong concussion, by seizing one part the coil with the hands, and striking it vily against a bench several times. Vibra-n, it is affirmed, is the cause at times of a ecular change in brass chandelier chains, sing them to snap without apparent cause. ta metal, which is a variety of brass con-ning a proportion of iron, receives a good l of attention. Its power of resisting corro-n, often makes it specially valuable, while it o possesses great strength, toughness, and ability.

Bronzes are compounds consisting chiefly of per and tin, but which like the brasses, are en modified by the addition of other metals. able which is given of the composition of ient bronzes will be found of great interest. ording to the amount of tin present in nze the colour varies between red and white, l with a large excess of tin it becomes steel-y. Generally speaking tin whitens copper re than zinc, seventy-three parts of copper d twenty-seven parts of tin forming a white y. The greatest strength is found in that iety of bronze known as gun-metal, which tains about ninety per cent. of copper and per cent. of tin. Elaborate tables of the per-tin alloys, by the United States Com-ttee already referred to, are included.

ilicon-bronze promises to become a very valu-e material, especially for telegraphic and phonic purposes. The alloy is nearly equal pure copper in its power of conducting tricity, and much superior to the previously d phosphor bronze. Mr. W. H. Preece states t phosphorus has a most injurious influence the electrical conductivity of bronze, l that silicon-bronze is far superior and entirely replaced phosphor-bronze for tele-phic purposes. It is also important to e that although wires made from this y are very much lighter than ordinary wires, y are of equal strength, and it is affirmed t, if broken, they will not fall to the ground he ordinary ones do; but by reason of their h elasticity, they spring back and coil up se to the standards. It will occur to most ders that, if this assertion is well based, no re ordinary overhead wires should be in re permitted,—at any rate, in towns,—en an elastic silicon-bronze wire is available ch will obviously, if it really possesses the perties claimed for it, prevent those shock-accidents which have given overhead wires bad a name.

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metrical Drawing for Art-Students. By . H. Morris. London: Longmans, Green, Co.

actical Plane and Solid Geometry. By J. H. Morris. London: Longmans, Green, & Co.

scriptive Geometry. By T. H. Eagles, M.A. London: Walter Scott.

L that it is necessary for an art-student to ow about geometry is contained in the little k by Mr. Morris on "Geometrical Draw-." Commencing with a short introductory pter on the instruments needed, and the y to use them, he proceeds to define the ious terms used in geometry, and to work all the ordinary problems, from bisecting a en straight line, to the construction of an pse or a spiral, and as a figure is in all cases ached, the student should find no difficulty naking himself acquainted with the methods ployed. To test the learner's progress, a ge number of exercises are given, taken from examination papers of the Science and Art partment and other sources. At the end of book, a chapter is devoted to Elementary id Geometry, and most of the ordinary problems in this part of the subject are dealt with in a very complete manner.

In "Practical Plane and Solid Geometry," Mr. Morris has furnished a text-book which contains sufficient not only for candidates for the elementary examination of the Science and Art Department, but also for the general student of geometry. The work forms one of Longmans' Elementary Science Manuals, but, except that it is somewhat larger and treats the subject in a more advanced manner, it does not differ materially from the book for art students by the same author.

The book on descriptive geometry by Mr. T. H. Eagles, has been written for those who wish to make themselves thoroughly conversant with the principles of geometrical drawing, and are not contented with a knowledge of the mere outlines of the subject. To work through a book such as this will, no doubt, be beneficial to students, if only for the exercise of the reasoning powers which it will necessitate, but at the present day those who are desirous of becoming successful architects or engineers have not sufficient time at their disposal to warrant them in trying to master any comprehensive treatise on geometrical drawing, and they will, in our opinion, be more profitably employed in acquiring knowledge which there is a probability they may require in after years in the actual practice of their profession. It is certainly of the greatest importance to thoroughly understand the fundamental principles of geometry and their practical application, but in order that the student can "show that the focal hyperbola of a given ellipsoid passes through the umbilics," as he is asked to do by the author on page 297, he must give an amount of time to the subject, which simply means he has neglected others, many of which we consider would be of far greater value to him in every-day life.

The Principles of Perspective as Applied to Model Drawing and Sketching from Nature. By G. Trobridge. Second Edition, revised and enlarged. London: Cassell & Co.

This is a small and compact little book on perspective, which aims at avoiding theory and a multiplicity of complicated diagrams, and practically teaching perspective, while in the act of making a drawing. It is always difficult to be sure whether definitions and directions which appear so simple to those who already understand perspective are as simple and obvious to a beginner. What we find in this little book, as in many others, is that there is hardly a clear enough statement of the reason why there is a horizontal line, a picture plane, and a vanishing-point; though the way it actually works, so to speak, is pretty clearly shown by examples (a brick wall with the joints in perspective, for instance). The student is told that when looking at a landscape from a low level, the horizontal line will be low, and that it will be high when looking from a higher level, and two small sketches are given which illustrate the fact. But there seems a want of an attempt to put in plain words what may be called the philosophy of the fact—the why and wherefore. It is no doubt a difficult thing to do, but it does not seem to be sufficiently attempted. The drawing on the window pane with transparent paper is after all the best practical example of what appears to all beginners the mystery of perspective.

Apart from this defect, which it has in common with nearly all books on perspective, this is a useful little book, and some practical hints thrown out by the way, such as the use of a pencil or rule to hold between the eye and the object in sketching landscape or buildings, by way of grasping the actual direction of a line on the picture plane, are very useful. In sketching buildings this kind of testing of the main lines at the outset often saves much trouble afterwards.

Memorials of Old Chelsea. By Alfred Beaver. Nos. 1 and 2. London: Elliot Stock.

These are the first two parts of a book which is appearing in a serial form. So far, it is a historical account of the neighbourhood, with illustrations of its former state, reproduced from old plates or copied from old drawings. The neighbourhood is one in which much interest has been aroused in recent years, and the book, when completed, will be an agreeable and useful memorial of its history.

Correspondence.

To the Editor of The Builder.

BYZANTINE ARCHITECTURE.

Sir,—I have been very much interested in the able lectures of Professor Aitchison, and agree with him in thinking that we are much indebted to M. Choisy for the aid he has given us towards the better knowledge of Roman and Byzantine construction.

To him and to Professor Middleton we owe a debt of gratitude for their researches into the practice of monolithic construction, and to MM. Perrot and Chipiez and to Professor Baldwin Brown for the light they have thrown on its origin,—a form of construction which is largely used in the present day, and is likely to to be still more largely adopted.

I venture, however, to think that Professor Aitchison, following the lead of M. Choisy, is mistaken in describing the core of Roman work as "rubble." Rubble walling is generally understood, and is practically defined by the various regulations for its use, to be a construction of stone of an inferior sort, and, as such, is required to be thicker than a wall of dressed stone or brick. Its strength depends on the careful interweaving of its parts, and on its being bonded with more or less frequency. It requires the work of a skilled man, and such skill is the stock-in-trade of a good waller. It need not necessarily be built with any mortar at all, for in this district dry rubble walls are of common occurrence. Roman work differs materially from this. The rubble is an accident, an accessory, which may be replaced by any other suitable aggregate; the essential is the mortar or cement, which unites the whole mass into a coherent conglomerate, and forms a monolith of equal strength throughout, without necessarily any tie or bond. A construction such as this is, I think, properly described as of concrete, for I hold that it matters little how the conglomerate is formed provided that the result attained is the formation of a monolith.

All the evidence we have goes to prove that the Romans, as is the practice now, varied their method of formation to meet different requirements; in the case of partition walls, referred to by Professor Middleton, the concrete would naturally be almost of the nature of a fine grout, with here and there a filling popped in, as is now the practice, to fill up a pocket. On the other hand, in walls of great thickness, such as those of the Pantheon, it seems probable that within the area of the encasements, all the processes necessary for the construction of the wall were carried on; not only so, but it seems reasonable to suppose that within that area workmen's stairs of access and convenience for the delivery of material were contrived, which, to some extent, may account for the arches and so forth found in the brick encasement of the Pantheon.

M. Choisy appears to think that the object of the brick or stone facing was to protect the core from rain; but hydraulic cement is bettered by wet.

Professor Middleton appears to think it was of no use at all, and that the Roman builders knew it to be so,—that, in fact, it was merely a survival of some forgotten mode of building, as are the buttons behind one's coat of a former style of dress. I am strongly of opinion that the facing of brick or stone formed the actual encasement within which the conglomerate was packed, and formed an essential part of the construction, and that, except under special circumstances, no other casing was required. Take, for instance, the construction we meet with in England. In "The Celt, the Roman, and the Saxon," the author, Mr. Thomas Wright, describes the construction thus—"The facing stones were first built up to a certain height, and set in mortar of a firmer and better description; then fresh liquid mortar was poured in in large quantities, and, in the space between, heaps of rubble or stones were cast in with it, and the whole soon hardened into a solid mass." Mr. Wright did not pretend to be a practical builder, and is, therefore, not quite accurate in his description; but, in my opinion, he laid hold of the essentials of their method. Dr. Bruce, in his "Roman Wall," says that he is enabled to state, on the authority of engineers well acquainted with the Roman wall, that the mortar of that structure is precisely similar to the grout and concrete of the present day. When used as concrete, the mass will set in three hours, and have solidity suffi-

cient to bear the weight of a man, and, in about three days it will have acquired a rock-like firmness. To let the wall speak for itself:—

From Bowness on the west to Wallsend on the east coast, it consists of two external facings of stone, without a tie or bond from end to end; the stones which form these two facings taper and have their smaller ends towards the core or inside of the wall, so that if the stones touched each other, or had merely a layer of mortar on their outer beds, there was a vacancy of some three or four inches between the faces of their inner beds, which thus formed a toothing for the reception of the concrete, and so enabled the whole to be formed into one coherent monolith.

In the same way, the triangular bricks we find in use in Rome were specially contrived to form on their inner face a series of similar toothings for the reception of the concrete or of the coarse mortar which formed its essential part.

M. Choisy appears to think that with such an encasement concrete could not be rammed, but in my opinion it is a mistake ever to think of concrete as a fluid mass, and in its application in the present day concrete has always to be spread over the surface or space it is intended to fill. It will stand where floors of 7in. or 8in. in thickness are being formed with an almost upright edge. It is a common occurrence to see concrete laid on one part of a bay of centreing and being rammed in the same bay with no encasement whatever. It appears to me, therefore, conclusive that the Roman method of building was of concrete, and that the object of the encasements or other additions to it was to enable the mass to carry itself as the work progressed; if it was not the case that work done yesterday was sufficiently stable to carry that of the following day, I fail to see what possible scaffolding or temporary encasement of wood could be contrived to carry walls of the height and weight of Roman walls built above the ground. I am unable to throw any more light on the interesting theory worked out by M. Choisy as to the ribs of tile work carried out in the vaulting. I have not recently been in Rome, and the traces of these ribs are difficult to discover; but it appears to me that if such vaults as we find in Rome were to be carried out now, some such system of dividing the work into sections as that illustrated by him would have to be adoped, if for no other reason than for the purpose of counteracting the expansion likely to occur in so large a mass, and that it would have the effect of making the vault self-supporting as the work was being proceeded with.

The writings of MM. Perrot and Chipiez, and the interesting paper by Professor Baldwin Brown on the origin of Imperial architecture, go to prove that the Romans did not invent concrete, but by their universal use of it they made it essentially their work; and it is interesting to note how, down to Norman times, the endeavour to build in the Roman manner is still to be traced, not only to some extent in their walling, but in such details as the formation of circular staircases on a core of concrete, and even in the arches of the arcades of such churches as St. Peter's, Northampton, and Melbourne, in Derbyshire, where the facing stones of the arches form an encasement only, the soffit of the arches being of concrete, and without a tie or bond to be seen.

CHARLES J. FERGUSON, F.S.A.

Carlisle.

INTERNATIONAL FINE ART EXHIBITION AT BERLIN.

SIR,—We are directed by the Council of the Royal Institute of British Architects to inform you that they have accepted an invitation, sent in the name of the Berlin Institute of Architects, to select a certain number of architectural drawings and photographs for the International Fine Art Exhibition to be opened at Berlin in May, under the patronage of the Empress Frederick, Princess Royal of Great Britain and Ireland.

The drawings or photographs to be selected must be of architectural works executed during recent years, and "representative of the methods at present most dominant in English architecture." The cost of packing, transporting, and insuring the same, to and from the Exhibition, will be defrayed by the authorities in Berlin. No works of art of any kind which were exhibited at the Great Exhibition held in Berlin in 1886 will be admitted.

We are also to ask you, Sir, to allow us to state in your columns that architects, whether members or not of the Royal Institute, who may be desirous of sending drawings or photographs of their executed works to the International Exhibition above-named, are requested to forward their names and addresses,—with the subjects and sizes of their proposed exhibits,—to "The Secretary, R.I.B.A., 9, Conduit-street, Hanover-square, London, W.," not later than noon on Monday, 23rd instant.—We are, sir, your obedient servants,

ASTON WEBB, Hon. Secretary.
WILLIAM H. WHITE, Secretary.

Royal Institute of British Architects, 9, Conduit-street, Hanover-square, London, W., March 17, 1891.

COMPTON WYNYATES.

SIR,—In connexion with the beautiful measured drawings of that most interesting house, Compton Winyates, may I remind your readers that a series of photographs taken by me when the house was visited by the Architectural Association in 1885, appeared in the *Builder* of March 20, 1886, as illustrations to a paper read before the Architectural Association by Mr. S. Flint Clarkson?

Dublin. JOHN L. ROBINSON.

The Student's Column.

VENTILATION AND WARMING.—XI.

LOSS OF POWER IN DUCTS AND FLUES.

OF very high importance, to the architect especially, is the loss of power that results in ducts and flues from contraction, change of direction, and friction. This loss of power is taken account of in our general formula by the factor ΣC, and to obtain the value of this, the experimental results obtained by Péclet are generally utilised.

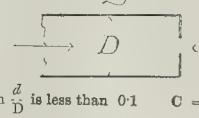
We will give a table of co-efficients deduced from Péclet's observations, and then show how these can be practically applied.

Loss of power results when the air is forced from a duct of greater section through an opening or duct of less section, and conversely a gain of power ensues when the change is from the lesser to the greater section.

If we take P for the power necessary in the first section to obtain any particular velocity, and p for the corresponding power in the second section, and C for the co-efficient of loss or gain, the loss or gain in either case is Cp—that is, $P - p = \pm Cp$, and $\frac{P}{1+c} = p$.

Case 1.—Outflow from duct through narrow opening into free space.

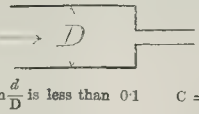
FIG. 12.



When $\frac{d}{D}$ is less than	0·1	C =	1·367
=	0·1	=	1·366
=	0·2	=	1·60
=	0·3	=	1·44
=	0·4	=	1·30
=	0·5	=	1·23
=	0·6	=	1·16
=	0·7	=	0·83
=	0·8	=	0·56
=	0·9	=	0·32
=	1·0	=	0·

Case 2.—Outflow from duct into one of lesser diameter.

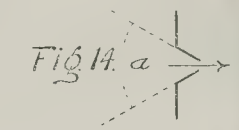
FIG. 13.



When $\frac{d}{D}$ is less than	0·1	C =	0·451
=	0·1	=	0·45
=	0·2	=	0·49
=	0·3	=	0·45
=	0·4	=	0·42
=	0·5	=	0·35
=	0·6	=	0·29
=	0·7	=	0·21
=	0·8	=	0·13
=	0·9	=	0·06
=	1·0	=	0·

Case 3.—Outflow from open space thro an angular diminishing opening where a is angle of opening and when $\frac{d}{D}$ is not less t 0·1:—

FIG 14.

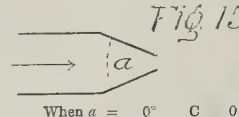


When a =	0°	C =	0·45
=	5°	=	0·11
=	10°	=	0·04
=	20°	=	0·02
=	30°	=	0·00
=	40°	=	0·11
=	50°	=	0·56
=	60°	=	0·73
=	80°	=	0·83
=	100°	=	0·93
=	120°	=	1·04
=	140°	=	1·16
=	160°	=	1·22
=	180°	=	1·366

N.B.—It will be seen that in this case the efficients range between those of Case 2, wh corresponds with an angular opening wh angle is 0° and Case 1, where the angu opening is 180°

Case 4.—Similar to last, but with the f from a duct to free space.

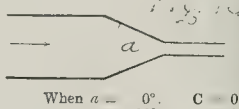
FIG 15.



When a =	0°	C	0·0
=	10°		0·06
=	20°		0·16
=	30°	=	0·26
=	40°	=	0·35
=	60°	=	0·45
=	80°	=	0·49
=	100°	=	0·56
=	120°	=	0·78
=	140°	=	0·88
=	150°	=	0·98
=	160°	=	1·10
=	170°	=	1·23
=	180°	=	1·366

Case 5.—Similar to last, but with the f from one duct to another of lesser diameter.

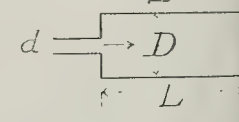
FIG 14.



When a =	0°.	C =	0
=	10°		0·13
=	20°	=	0·18
=	30°	=	0·23
=	40°	=	0·29
=	60°	=	0·32
=	80°	=	0·35
=	100°	=	0·38
=	140°	=	0·42
=	180°	=	0·45

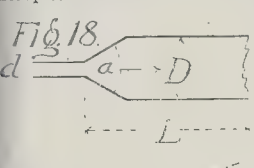
Case 6.—Converse of Case 2. Hence ther a gain of power. When the length of gres duct is equal to or more than $6\frac{1}{2}(D - d)$ co-efficient of increase is as follows:—

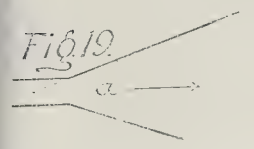
FIG 17.



When $\frac{d}{D}$ =	0·1	C =	0·02
=	0·2	=	0·08
=	0·3	=	0·17
=	0·4	=	0·27
=	0·5	=	0·38
=	0·6	=	0·47
=	0·7	=	0·43
=	0·8	=	0·22
=	0·9	=	0·17
=	1·0	=	0·

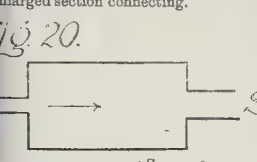
Case 7.—Converse of case 5. As in the last on length of larger duct, including the ular enlargement is equal to or more than (D−*d*), and when the enlargement opens free space





When *a* =	0°	C = 0
=	1°	= 0.35
=	2°	= 0.54
=	3°	= 0.66
=	4°	0.74
=	5°	0.80
=	6°	0.83
=	7°	= 0.83
=	8	= 0.81
=	9°	= 0.67
=	10°	= 0.56
=	12°	= 0.49
=	16°	= 0.45
=	20°	= 0.41
=	25°	= 0.37
=	30°	= 0.28
=	40°	= 0.14
=	50°	= 0.10

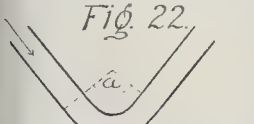
Case 8.—Outflow from smaller to larger duct, enlarged section connecting.



the co-efficient $C=\left(\frac{S}{s}-1\right)^2$ where S is ctional area of the second duct, and *s* of the first.

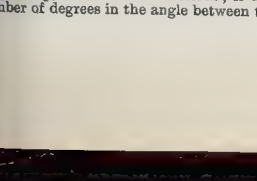
m these tables we see the very important which change of form or section plays in ing the pressure necessary to maintain a velocity. Some of the figures may appear r astonishing, but the high authority of t's investigations has led to their recogni-

s of power results also when the direction cts is changed. With a sharp angular e, as in fig. 21, the co-efficient of loss for



s from 20° to 90°, $C = \sin^2 a$, therefore a right-angled break $C = \sin^2 90° = 1$. eaning of this will be seen if we work e value of $\frac{P}{1+C} = p$, which we saw above the relation between P, the pressure the obstruction, and *p*, the pressure after. fore with a right-angled turn $\frac{P}{1+1} = p$, $= 2p$, that is, half the power is lost by bstruction caused in a duct thus con- ed.

he angle is rounded, as in fig. 22, instead



ng sharp, the evil is less serious; if *a* is mber of degrees in the angle between the ducts, we have for the co-efficient $C=\frac{a}{180}$; thus, for a right-angled turn with rounded angle, $C=\frac{90}{180}=\frac{1}{2}$. Similarly with a semicircular turn, as in fig. 23, $C=\frac{180}{180}=1$.



The loss of power through friction against the sides of channels or ducts has also to be considered. With this we shall continue in the next chapter.

SURVEYORSHIPS.

Llandudno.—The Llandudno Improvement Commissioners met on Saturday last to fill the appointment of Engineer and Surveyor, vacant by the resignation of Mr. Marks, C.E. Mr. L. Paley Stephenson, A.-M. Inst. C.E., of the City Engineer's department, Liverpool, was appointed to the office.

Grimsby.—Mr. M. Petree, assistant to Mr. T. de Courcy Meade, M.Inst.C.E., Engineer and Surveyor to the Hornsey Local Board, has been unanimously elected Assistant Borough Surveyor of Grimsby.

OBITUARY.

Mr. J. Dick Peddie, R.S.A. We regret to record that this well-known Scotch architect died on the 12th inst., in his 68th year. The *Scotsman* says that his father, the late James Peddie, W.S., of the firm of Messrs. J. & A. Peddie & Ivory, destined him at first for the legal profession; therefore, on completing his education at the Edinburgh University, he spent five years in the study of the law before his natural taste for art asserted itself. Devoting himself then to the study of architecture with all the energy and industry of which he was capable, he quickly raised himself to a foremost place in the profession, and before his term of pupilage had expired, he distinguished himself by defeating the best Scottish architects who sent in competitive designs for the building of Queen-street Hall. This was his first important work, and was soon followed by many others in different parts of Scotland. Cockburn-street, Edinburgh, the construction of which swept away a labyrinth of ugly buildings penetrated by foul and narrow closes, was built from his designs; and among his other notable works (designed by himself or in conjunction with his partner, Mr. C. G. H. Kinnear) were the University Club, Edinburgh; the telling room of the Royal Bank in Edinburgh; the Scottish Provident Institution's Office, Edinburgh; St. Cuthbert's Poorhouse; Chalmers Hospital; the Morgan Hospital, Dundee; the City of Glasgow Insurance Office, Glasgow; the public buildings at Aberdeen; the Sheriff Court-House, Greenock; and the Royal Bank, Glasgow. He entered Parliament as Member for the Kilmarnock Burghs in 1880. We may add that he was the one professional member on the Westminster Hall Commission, and strongly upheld our view with regard to the "restoration" of that building. The funeral took place on Monday last at the Dean Cemetery, Edinburgh.

Sir Joseph Bazalgette.—We regret to announce the death of Sir Joseph Bazalgette, which occurred on Sunday last at his residence, Wimbledon. According to "Men of the Time," he was born at Enfield, Middlesex, in 1819. At the age of eighteen he was articled as pupil to Sir John MacNeil, C.E. In 1845 he was practising on his own account as engineer in Great George-street. During the railway mania he was very busily engaged in laying out schemes for railways, &c. Retiring from practice in 1847 through ill-health he returned to London in 1848 to accept an appointment as assistant engineer under the then Metropolitan Commission of Sewers. On the death of the Chief Engineer of the Commissioners, in 1852, Mr. Bazalgette was selected from among thirty six candidates to fill the vacant position, being first appointed under the title of General Surveyor of Works, and afterwards as Chief Engineer. On the creation of the Metropolitan Board of Works in 1855-6 he was elected Chief Engineer to that body. His first important work was the carrying out of the Metropolitan Main Drainage system, the works of which were executed between the years 1858 and 1865. The Victoria, Albert, and Chelsea embankments were carried out by him between 1863 and 1874. One of his latest works is the new granite bridge over the Thames at Putney. He resigned his position when the London County Council succeeded the late Metropolitan Board of Works. He was knighted in 1874.

Herr Endell.—The head of the architectural department of the Prussian Ministry of Public Works, Herr Oberbaudirektor Endell, died on the 9th instant, after a short but severe illness, at the early age of forty-seven years. Herr Endell was well known in Germany on account of his being one of the very few Government officials who have enjoyed a rapidly successful career. Having but twenty years ago passed his government architect's (Baumeister) examination, he was made a "Bauinspector" in 1876, a "Baurath" in 1879, and a "Geheimer Baurath" and Privy Councillor in 1883; in 1889 he was elected to hold the important post of a "Geheimer Ober-Baurath" and Special Councillor to the Emperor, and in 1890 he held the highest position he could obtain in his department of the Ministry of Public Works, which, as was an open secret, was to be shortly followed by a place in the Cabinet. Outside Germany, Herr Endell was known as editor of the official journal of the Ministry of Public Works, the "Zeitschrift für Bauwesen," and also as editor of the official "Central Blatt der Bauverwaltung" at the time of its formation in 1881 (which latter paper he has always taken great interest in), and some of his work in the formation of building-laws, arrangement of Government building statistics, etc., will be found in technical libraries. His clear judgment and high character obtained for him his success, and these qualities were also the cause of his being one of the most esteemed jurymen at all the great architectural competitions of the last decade.

GENERAL BUILDING NEWS.

Re-opening of the South Transept, St. Bartholomew-the-Great, West Smithfield.—On the 14th inst. the restored south transept of this church was re-opened by the Bishop of London. The restoration, which has been carried out by Mr. Aston Webb, the architect, has brought to light the remains of much of the old work, which had been hitherto concealed by brick and plaster, and it has also included the addition of one bay, forming a baptistery, with increased seating accommodation.

New Baths, Southampton.—New swimming-baths are in course of erection on the Western Shore, Southampton. The buildings are being constructed of red brickwork, with terra-cotta dressings and enrichments, in the Italian style. The front elevation facing the Western Shore road is 224 ft. long, with two central towers, 50 ft. high. These towers will be used, one for a smoke-shaft, and the other for the reception of water-tanks, and also for upcast shafts for the purpose of ventilation. The end elevations will be similar, with a total depth of 72 ft. The main front entrances are between the towers, separate for men and women. Internally, the establishment will consist, first of a spacious vestibule, with pay-office in the centre, commanding the approaches to all departments, and also to the existing open swimming-bath at the back, which will be retained. The private baths are ten in number for each sex, placed in the front part of the building, in two saloons 52 ft. by 25 ft., and 16 ft. high, on either side of the vestibule, provided with waiting-rooms, and arranged in first and second classes. The ceilings will be curbed, and formed with zinc sheets, ornamentally perforated for the purpose of ventilation, the space above, between the ceiling and the roof, being directly connected to the upcast shafts in the towers before-mentioned. At the end of each of the saloons space is provided for the Turkish baths. The swimming-baths are two in number, and situated immediately in the rear of the private baths, one for men and one for women, entered from the vestibule by separate entrances. The basins are each 75 ft. long by 30 ft. wide, constructed of Portland cement concrete walls 2 ft. 3 in. thick, and faced with white glazed bricks with tiled platform all round, upon which will be placed dressing-boxes. The baths are to be 3 ft. 3 in. deep at one end, graduating to 6 ft. at the other, and a gallery will be provided at the end for spectators. The platform level of the baths is 7 ft. 3 in. below the level of the vestibule; admission to the baths will, therefore, be by the above galleries, which lead off the vestibules. The roofs are to be constructed of wrought iron, boarded internally, and surmounted by lantern lights, in which will be provided ventilators. The baths will also be lighted by windows at the sides. Under the vestibule a basement is provided, in which will be placed two boilers for raising the temperature of the water in the swimming-baths by the injection of steam, also for supplying hot water to the private baths. The swimming-baths will be filled with salt water by gravitation, the same pipes being used for filling and discharging, and the water will be filtered through a polarite filter, supplied by the International Water and Sewage Purification Company, before entering the baths; both salt and fresh water, hot and cold, will be provided in the slipper-baths. The site of the buildings is protected from the tide by a solid masonry retaining wall, built on a concrete foundation, 3 ft. thick, having an average thickness at the base of 6 ft., and is carried up to a level of

3 ft. above high-water mark spring tides, with a coping 2 ft. 6 in. wide for its entire length, which is over 1,000 ft. By the construction of this retaining wall a considerable area of land has been reclaimed. This land will enable the Corporation to enlarge the establishment when necessary by two additional swimming-baths, but for the present the land is to be laid out as a recreation-ground, with foot-walks and shrubberies. The works have been designed and are carried out under the superintendence of the Borough Surveyor, Mr. W. B. G. Bennett, Assoc. M. Inst. C.E. The cost will be close on 9,000*l.*, and the whole of the works are to be finished by August next. The contractors for the retaining wall and the supply of the iron roofs for the swimming-baths are Messrs. Roe & Co., of Southampton; for the erection of the whole of the buildings, Messrs. Morgan, Isted, & Morgan, of Southampton; and for the heating apparatus, Messrs. Bradford & Co., of Manchester and London, have been recommended by the committee.

ST. ALBANS.—On Thursday, March 12, the Bishop of St. Albans opened the St. Peter's Sunday-schools and Parish-room, the site being given by Earl Spencer. The building contains a large parish-room, 30 ft. by 48 ft., two class-rooms, blanket-room, scullery, &c. The work has been executed by Mr. F. Wise, builder, St. Albans, at a cost of 708*l.*, from the drawings and under the supervision of Mr. F. W. Kinneir Tarte, architect, 36, Furnival-street, Holborn, E.C., and St. Albans.

ST. PAUL'S CHURCH, EDINBURGH.—St. Paul's, York-place, Edinburgh, which was, before the erection of the cathedral, designed by Sir G. G. Scott, the largest church in that city, is to be enlarged by the addition of a chancel. The church stands, as designed by Elliot at the beginning of the century, in the form of a parallelogram with octagonal turrets at each angle. The style is perpendicular, and seems to have been suggested by St. Mary's at Beverley. The west end and aisles are encumbered with heavy galleries which run across the aisle windows, and the organ occupies a portion of the west gallery. It is proposed to remove the galleries and construct a chancel 47 ft. in length, and of the same breadth as the nave. To the south of the chancel will be placed vestries for the clergy and choir, and to the north an organ chamber opening to the chancel with an arch and piers of the same span as those of the nave. The present great east window will occupy a similar position in the chancel, but it will be shortened so as to admit of a reredos being superimposed upon the alter. The flanking turrets will be rebuilt on each side of the window. The alterations will be carried out under the supervision of Messrs. Kinnear & Peddie, architects. To make this church complete architecturally, a tower at the west end (for which there is ample space) is needed. The situation is one where such a feature would appear to great advantage.

NEW CHURCH FOR SWINFORD, CO. MAYO, IRELAND.—On the 15th inst., a new church, which has just been erected at Swinford, co. Mayo, Ireland, was formally dedicated. The building is of the Gothic style of architecture, comprising nave, aisles, side chapels, and sacristy. The total length of the nave is 120 ft. The breadth is 59 ft. The building is of rubble stone, faced with broken ashlar. The dressings are of limestone from the Westport quarries. The building has been erected from the designs and carried out under the superintendence of Mr. William H. Byrne, architect, Dublin, while the building was entrusted to Mr. John Mulligan, of Swinford.

RESTORATION OF YARCOMBE CHURCH.—The restoration of the ancient church at Yarcombe, Devonshire, has just been carried out from plans and specifications prepared by Mr. Charles H. Samson, architect, of Taunton, the general contractor being Mr. Berry, of Honiton. On plan the church consists of a (new) chancel and organ chamber on the north side, nave, north and south aisles, south transept, south-west porch, and embattled western tower. The roof of the chancel is covered in with slates; the old roofs are flat and of lead. All the new doors are of oak, and the windows, old and new, are glazed with plain cathedral glass. Some fragments of Mediæval glass have been preserved in two windows on the north side. During the progress of the restoration an old piscina and a niche, carved and coloured, have been opened out in the south transept. The church rises at both ends. Arcades of four bays each divide the nave from its aisles, and the chancel arch is now opened out. The walls are stuccoed. The roofs are of English oak. The intersections of the timbers are hidden by bosses, some fifteenth-century work, the rest from the chisel of Mr. Harry Hems, of Exeter, who has executed the carving on the new chancel roof, which is also in oak. The floors of the body of the church are laid with wood blocks. The church is seated with open benches, and in the chancel will be stalls of oak.

MINERS' HALL AT NEW BRANCEPETH, NEAR DURHAM.—A new miners' hall, which has been erected at New Brancepeth Colliery by the owners and presented to their workmen, was formally opened on the 14th inst. The sloping nature of the site enables a reading-room, billiard-room, smoke-room, and store-room to be provided on the basement, level with the road. Above is a hall, capable of seating 500 persons, including a gallery at the end. The entrance to the hall is at the upper part of the site, level with the pavement, and in connexion with it are cloak-rooms, ladies' and gentlemen's retiring-rooms, with the usual accessories. The heating is by means of Musgrave's hot-air stoves, supplied by Messrs. Emley & Sons. The buildings are erected with pressed bricks and stone dressings, in the Renaissance style, from designs prepared by Mr. J. W. Taylor, architect, of Newcastle. The cost of the premises will be about 1,400*l.*

NEW FEVER HOSPITAL AT CLECKHEATON.—The memorial-stone of a new Fever Hospital for the North Bierley district was laid on the 14th inst. The site of the new building is in Oakenshaw-road, Cleckheaton. The buildings comprise an administrative block, a ward pavilion of two wards and twelve beds, an isolation block with four wards and ten beds, and a wash-house, &c. The plans for the new hospital have been prepared by Mr. W. Langley and Mr. G. C. Ross.

NEW FREE CHURCH FOR EDINBURGH. — The plans of the proposed new church, hall, and offices to be erected by the congregation of Warrender Park Free Church, Edinburgh, have just been approved by the Dean of Guild Court. The site of the buildings is at the corner of Greenhill-gardens and Whitehouse-loan. The plans show a church measuring internally 80 ft. by 40 ft., and having galleries running round three sides, and giving in all an accommodation of over 800 sittings. The hall gives accommodation for 200 sittings. Grouped in plan with the hall is the committee-room and vestry. The church proper is entered from a hall, from which start two stone gallery staircases, while there is a retiring-room with lavatory accommodation attached. The main entrance door is shown in elevation towards Whitehouse-loan, while two exit doors are shown in elevation towards Greenhill-gardens. The style of architecture adopted in the treatment of the elevations is an adaptation of Italian Renaissance of the sixteenth century. The architect is Mr. R. A. Cameron, of Edinburgh, whose plans were accepted recently in competition. The cost of the whole work is estimated at 5,000*l.*

A PROPOSED NEW MUSIC-HALL FOR EDINBURGH. —A company has been formed, under the title of the Edinburgh Empire Palace Company, to establish a new variety music-hall in the south side of the city. The plans for the new structure, which have been prepared by Mr. Matcham, architect, London, show a building capable of accommodating 3,000 persons, and lighted by electricity. The outer walls of the present circus, which stands on the site of the proposed new theatre, will be retained, and it is anticipated that the building can be erected for about 12,000*l.*

NEW HALL, CRUMPSALL.—The Bishop of Manchester on the 11th inst. formally opened St. Mary's Hall, Crumpsall, a building which has been built near St. Mary's Church to serve a variety of parochial purposes. The building has been constructed from the plans of Mr. Thomas Muirhead, architect, of Manchester, at a cost of over 3,000*l.*

THE ALTAR SCREEN OF WINCHESTER CATHEDRAL. —The work of restoring the altar screen of Winchester Cathedral, begun six years ago by Dean Kitchin, has just been completed. This addition to the cathedral was erected in the last part of the fifteenth century by Bishop Fox, and its niches were filled with nineteen large and thirty-eight small statues, till they were demolished in the time of Queen Elizabeth. The sculptors for the new work were Mr. Nicholls, who designed eight figures (those immediately over the altar), Mr. Geflowski ten, Miss Grant two, Messrs. Farmer & Brindley one, and the remaining thirty-six have been executed by Mr. Boulton, of Cheltenham, under the supervision of Mr. C. E. Buckler. Fifty-six statues now enrich the screen, and the work of restoration has been completed at a total cost of 5,400*l.*

A NEW CONGREGATIONAL CHURCH AT BRADFORD.—A new Congregational Church in Aireville-road, Frizinghall, Bradford, was opened on the 10th inst. by the Rev. John Hunter, of Glasgow. The new structure, which has accommodation for about 450 persons, is in the Gothic style of architecture. The centre gable is flanked with the tower and spire, rising to a height of 100 ft., and on the other side by the staircase gable. Internally the church comprises nave, transept, and chancel, with gallery at the back, the floor of the chancel being paved with marble. The seating is in pitch pine, whilst the pulpit is of oak. The roof is open-timbered, and the windows are filled in with leaded lights. Mr. H. Isitt was the architect.

SANITARY AND ENGINEERING NEWS.

EDINBURGH AND THE HORNSEY "DESTRUCTOR." —On Saturday last the Lord Provost of Edinburgh, accompanied by some members of the Town Council, together with the Dean of Faculty, the Town Clerk, and other officials, paid a visit to the new sanitary depôt of the Hornsey Local Board, where they were received by the Chairman of the Board, Mr. H. R. Williams, and Mr. de Courcy Meade, M. Inst. C.E., the Board's Engineer, by whom they were conducted over the various buildings, the greatest attention being concentrated upon the works connected with the dust destructor, which underwent a very minute examination. In the course of the visit the Lord Provost stated that for years past the whole of the house-refuse of Edi burgh had been sent to the farmers, who till late had willingly received it, but they now declined take any more, and the Corporation were conse quently placed in great difficulty with a larg accumulation of dust with which they mu deal somehow. Mr. Meade explained the proce through which the dust passed from the time of i delivery till its withdrawal from the furnaces clinker. During the visit two or three of t furnaces were drawn; the visitors, therefore, ha not only the opportunity of seeing the furnace filled, but of witnessing the final transformatio into a hard substance as clinker, which appears be much in demand. After expressing their sati faction with the orderly and effective manner which the work was carried out, the Lord Provo tendered his thanks, as well as those of his co leagues, to the Chairman and Engineer of t Board, for the courtesy which had been extende to them, and assured them that their visit h given them great satisfaction. On the day previo a deputation from the Toxteth Park Local Boar near Liverpool, visited the destructor works.

FOREIGN AND COLONIAL.

FRANCE.—The Municipal Council of Paris has vote 2,000 francs towards the proposed monument Meissonier.——M. Alphand has been appointed succeed the late Baron Haussmann at the Académ des Beaux Arts.——The Société des Peintre Graveurs, of which M. Bracquemond is the presidem has been formally and officially constituted. —— Minister of Commerce will apply shortly for t necessary vote for the participation of Fran in the Chicago exhibition.——The Chamber Deputies has under consideration a co cession to the Orleans Railway Compa for various new lines of a total length 730 kilomètres.——In spite of many protes s fro artists and archæologists, the Government h authorised the destruction of the Port de France Belfort, dating from the time of Vauban, on t ground that it obstructs the traffic between t old town and the new suburbs.——The chur of Colombes is undergoing restoration. It belon to three distinct epochs, and presents a curio mixture of Romanesque, Gothic, and Renaissan work. The clock-tower, which dates from t eleventh century, is in a ruinous state.— The Mairo of Lille has come to Pa to consider the project for the monument General Faidherbe to be executed by Mercié. The design consists of an equestri statue on a high pedestal decorated wi figures symbolising France, Africa, and t principal towns of the north.——A subscri tion committee has been formed at Frontigu to erect a bust there to the memory the painter Sebastien Bourdon, born in 16 and who died in 1676.——The town of Ca Biron, where Bernard Palissy was born, asked the Paris Municipality for authority to e cute a reproduction of the bronze statue of t artist in the Square St. Germain, the work Barrias.——The French architects have been invit to take part in a competition for the erection Para, in Brazil, of a monument commemorating proclamation of the Brazilian Republic.——At Galérie Durand-Ruel in Paris an exhibition been opened of the works of the painter Eug Bondin.——A fine-art exhibition is to be opened Nantes on April 4, to close on May 4.—— exhibition of painting, sculpture, and ar tecture is to be opened at Nimes on May ——A fine-art exhibition is to be opened Avignon, at the Hôtel de Ville, on May ——A collection of tombs of the Merovingi epoch has been discovered at Bouillard. Skelet vases, medals, and silver ornaments have b found there.——A small farmer at Loiret has covered, in preparing the foundations for a buildi an antique fragment, the torso of a female stat somewhat resembling the similar fragment fo near Poitiers in 1876, and now in the Louvre.—— competition for the building of "Salles des Malad in the garden of the hospital at Compiè has just been decided. The first premium awarded to MM. Bourdilliat and Colombier, Paris, the second to M. Marcel, of Paris, and third to M. Stra, of Compiègne.——The commi for the decoration of the Hôtel de Ville, of P has proposed to the Municipal Council the nam M. Émile Barran, as successor to the late M. J Lewis Brown, who left uncompleted his panel tended for the decoration of the Salon des Sciet

BERLIN.—The annual "Schinkel Celebrati was held under the auspices of the Architek Verein zu Berlin on the 13th inst., when Profe Hauck, of the Royal Technical College, read a p on "the career and duties of a constructor which discourse many allusions were made Goethe's opinion on the subject. At the ban following this first part of the celebration, Profe Reuleaux, Geheimrath Tungnickel, and Bau Blankenstein headed the list of speakers. Acc ing to the annual report of the Architekten Ve this society has at present 594 town and l country members. Its library counts 18 volumes. The Emperor has bought a portra Dr. Schliemann, painted by Mr. Sydney Hodges

presented it to the "Museum für Voelkerde," in which the collections given by the ased to the German Government are being at present. At the Royal Technical College, the oration of unveiling two busts of the deceased essors Spielberg and Winkler, took place on the inst. Professor Wolf, of the architectural ion, made a memorial speech on the decorative t Spielberg, and Professor Goering, of the neering division, described the life and work of eceased colleague Winkler. Professor Reuleaux, Rector, before unveiling the busts (executed by iate Professor Luersen), gave an address to the ents.——According to official statistics, 5,362 ons have been enjoying the benefit of technical cation at the new technical colleges of the man Empire during the winter 1890–91; of e, 830 belonged to the architectural divisions. A monument to the deceased Empress Augusta be erected in Berlin, and Professor Herter has invited to execute the sculpture. The Pro-or's idea (which can be seen in form of a model) place the bust of the Empress on a high estal, at the base of which are placed, on the side, a woman nursing a child, and, on the r, a veteran pensioner pointing out the bust to standing at his side,—both these side groups rring to the deceased's benevolence, firstly, to iren's hospitals, and, secondly, to the Red Cross ety working under her patronage.

ENMARK. The fund for the building of a new ustrial Art Museum in Copenhagen is progressing sfactorily, a considerable sum having already ein, besides gifts of exhibits.——The great Blege- Hospital in Copenhagen has been considerably rged and improved during the last two years, at ost of 20,000*l.*, the architect being Professor ger.——The Copenhagen Municipality has ac-ed an excellent site for the new Central Electrical tion, at a cost of about 20,000*l.* The station is nded to supply 39,000 glow-lamps.——The great railway station at Elsinore, on the Sound, bugh which passes the entire traffic from and Sweden and Norway, has now been com-ed. The style is Gothic Renaissance, the ma-al used being red bricks, with a basement of shed granite, 10 ft. in height. The building nds on about 2,000 wooden piles. All orna-ntations, door and window frames, &c., are of istone from the island Oland. The roof and ers are covered alternately with slates, copper, lead. The front elevation has a length of ft., that of the two wings being 140 feet each. r the main entrance, borne by six columns of polished granite, rise two towers, having a ght of 110 ft. The platforms are 530 ft. in gth. A post and telegraph office is to be added he same style and of similar material. The cost the undertaking will be about 120,000*l.* The nitect is Herr Mynster, of Copenhagen.——The lding of the great so-called "Marble Cathedral" Copenhagen, upon which work has been going on many years, is progressing, although slowly n want of the necessary grants. The great ues of biblical personages which are to orna-nt the frontage have just been mounted. They 15 ft. in height, weigh 1,600 lbs., and are cast finc in Copenhagen.

TOKIO. — Last Saturday's *Deutsche Bauzeitung* olishes some interesting drawings of work per-ning to the erection of the new Houses of Parlia-nt at Tokio, the architects being Messrs. Ende & eckmann, of Berlin. According to this publica-n, in which we see, besides the design of the visional building which had but so short a life ive weeks (burnt down owing to accident to an ctric wire, January 19), the drawings of the liminary design for the proposed monumental ction, in Renaissance style and crowned by a ola of large dimensions, and also the elevation a second design, in which a combination of naissance masonry surmounted by wooden roofs old Japanese form has been adopted. The plan ps Upper House and Lower House, with their embly-rooms, lobbies, refreshment and reading-ms, separate from one another at the opposite remities of the building, the connecting link ween these two independent parts being in form of two fine "salles des pas perdues," a top-lighted central staircase with royal vestibule and waiting-rooms attached, ch are also connected to the two "Houses" by pecial corridor off which a set of small committee ms and private rooms open. The block, as a ole, shows a frontage of some 180 mètres to a th of some 70 mètres; the two assembly halls are out 22 to 28 mètres, and the total length of the "salles des pas perdues" is nearly 100 mètres, to cost nothing is said. The Japanese Govern-nt are now doing the work themselves after itical troubles had caused them to abandon the a of having the block erected entirely under the erintendence of Messrs. Ende and Boeckmann their foreign staff. Herr Boeckmann spent 6 in Japan; his partner also spent some time in country during 1887.

GRANOLITHIC PAVING COMPANY.—The directors Stuart's Granolithic Paving Company, Limited, a meeting held in their London office on the h inst., recommended a dividend of 10 per cent. the past year, exclusive of their French and stralian business.

MISCELLANEOUS.

SOUTH LONDON POLYTECHNIC INSTITUTES.—The Committee of the South London Polytechnics have appointed Professor Garnett, the well-known Principal of the Durham College of Science, Newcastle-upon-Tyne, as their consulting specialist to confer with their two architects, Mr. Rowland Plumbe, F.R.I.B.A., for the Borough-road Institute, and the gentleman whose design is selected for the building at Battersea, upon the internal arrangements and technical requirements of these two important buildings.

THE EDUCATION AND REGISTRATION OF PLUMBERS.—Mr. John Holden, F.R.I.B.A., presided at a public meeting held under the auspices of the Manchester District Council for the National Registration of Plumbers, in the Technical School, Manchester, on 11th inst., and delivered an address on "Plumbing, Past and Present." At the same meeting, Mr. Wm. Jaffray read a paper on "The General Practice of Plumbing," in which he strongly condemned the use of a two-gallon flush in any form of water-closet.——A largely-attended public meeting in furtherance of the movement for the national registration of plumbers was held in the Town-hall, Newport, on the 13th inst. In the unavoidable absence of the Mayor, the Ex-Mayor (Mr. Mordey) presided, and among the gentlemen on the platform were Mr. E. Seward, F.R.I.B.A., President of the District Council; Mr. Councillor H. L. Carr, Vice-president; Mr. L. B. Moore, Mr. Fawckner (architect), Mr. Swash (architect), Dr. Davies, and Dr. Thomas. A resolution in support of the movement was carried unanimously.——The Prince of Wales presided on Monday afternoon at a meeting of the Organising Committee of the International Congress of Hygiene and Demography to be held in London in August next. The Lord Provost of Edinburgh was among those present, and supported the adoption of the Committee's report, including an arrangement for a special meeting of the Congress to consider "The National Education and Registration of Plumbers in relation to the Public Health."

ELECTRIC LIGHTING AT THE NATIONAL SPORTING CLUB.—The electric light installation at the premises of the National Sporting Club has been carried out by Messrs. Henry F. Joel & Co., of London. There are at present about 160 lights, but provision is made for extension to 300 lights. The fittings have been specially designed and adapted to assimilate with the general design of the building. In the theatre they follow the curves of the arches, lighting up the arena and also the decorated ceiling. Switches are fitted to turn any of the groups of the lights "off" or "on," and all the lights are under control in the porter's box at the entrance. Special switches, with detachable handles, are fitted in the billiard-room. The electric current is supplied by the Metropolitan Electric Light Co., and when the circuits were recently tested they gave an insulation resistance of over 5,000,000 ohms (more than ten times the required test). All the work has been carried out in accordance with the Fire Insurance Co.'s rules. There are some miles of insulated wire laid down, and many thousand feet of casings all painted with asbestos paint.

THE ENGLISH IRON TRADE.—The English iron market is still exceedingly quiet for the time of year, and business is dragging, being almost entirely restricted to immediate requirements, which are met by second-hand holders, while prices are beaten down by buyers, so much so that makers declare they would be losing money if they acceded to rates offered by consumers. The question of a reduction of wages is consequently coming to the front, employers having given notices to that effect. In the pig-iron market the putting in blast of Scotch furnaces has had the effect of further depreciating values. Prices of warrants are tending lower, and makers' iron is following the same course. In finished iron not much is being done, but rates, owing to the inability of manufacturers to continue selling at a loss, are still fairly well maintained, though weaker. There is a slightly better tone in steel. Large rail orders are in the market, and shipbuilders are buying somewhat more freely. On the whole, the latter continue fairly well, and in some cases briskly engaged; but engineers are beginning to feel the effects of a slacker demand.—*Iron.*

NEW SOUTH WALES.—We have received from the Agent-General for New South Wales the year book of the colony for 1891, issued by the New South Wales Government,* which contains a great deal of information as to the country; historical, commercial, and geographical.

THE ZONE TARIFF FOR RAILWAYS.—The adoption of the zone tariff on the Uddevalla-Venersborg-Herrljunga Railway, in Sweden,—the first one to adopt the system in that country,—has been attended with great success. The former fares were 4 öre (⅓d.) third, and 7 öre (1d.) second-class per kilomètre,—there being no first-class,—as against 25 öre (3d.) and 50 öre (6d.), at present per zone of 12 kilomètres; and during the first five months of the working of the system 11,158 second, and 80,057 third-class travellers were carried, the receipts amounting to 3,260*l.* In the corresponding period of 1889 the travellers numbered respectively 8,311 and 56,665, whilst the earnings were 3,100*l.* Thus, the increase of travellers is 26,239, and of earnings 160*l.* The current expenditure has not increased. A motion is before Parliament for the adoption of the system on the State railways with certain modifications.

THE SWEDISH COAL, CLAY, AND MARBLE INDUSTRIES.—Coals are only found in Sweden in one province, viz., that of Scania, the southernmost end of the kind termed lignite. However, the beds are of great extent and value, although the coals cannot be used in the iron industry, partly on account of their nature and more particularly on account of the great distance between the coalfields and the ironworks, entailing a too costly transport. But the coals are largely used on the State and private railways in the South of Sweden, the engines having been fitted with grates adapted to their consumption. The price at the pit's mouth is generally for best quality 1s. 4d. per hectolitre. The largest coal company is the Kropp Company which boasts a village on its property,—a rare occurrence in Sweden,—inhabited by its employés, with excellent sanitary arrangements, a school, a church, &c.

THE SWEDISH IRON AND STEEL INDUSTRY.—From the report just issued of the Swedish iron and steel industry in 1889, we learn that 393 mines were worked, whence were raised 983,600 tons of iron ore, as against 485 mines and 937,000 tons in 1888. In blast were 150 furnaces, turning out 420,700 tons of pig-iron, as against 162 and 444,000 respectively in 1888. The largest output from one works was 26,700 tons, or an average of 23·8 tons a day. As regards the bar-iron industry we find 181 works with 473 hearths engaged in the same, turning out 274,400 tons, as against 186 works, 525 hearths, and 248,000 tons in 1888. Of the former quantity 40,200 tons of bars were manufactured by the Bessemer, and 33,600 tons by the Martin process. The manufacture of steel in Sweden shows enormous progress of late years, although the increase in 1887-88 was but slight, viz., about 3,500 tons. But in 1888-89 the output was no less than 27,000 tons more than in the preceding year.

THE "SHAW" REFLECTOR GAS LIGHT.—This is a patent by Mr. Joseph Shaw (of Lockwood, Huddersfield) for applying reflectors above pendant gas lights, in such a manner as to be applicable to existing gas lights in residences. The reflector forms a wide shallow hood of inverted saucer shape, over the lights. It may be made decorative in appearance (we cannot say that the published patterns are so), and seems calculated to give a pleasing diffused light reflected downwards on the room, and probably would admit of some saving of gas, as well as the sanitary advantage of burning less gas and heating the air less. It appears to us that it would be possible with this reflector to mask the direct light from the gas jet altogether, and thus do away with the unpleasant glare of gas. The patentee does not suggest this in his circular, however.

THE DUKE OF WELLINGTON'S RIDING SCHOOL AND STABLES AT KNIGHTSBRIDGE.—This important freehold property, which occupies an exceptionally fine position near Albert-gate, extending from Knightsbridge High-road to Hyde Park, was sold by auction at the Mart, on Tuesday last, under instructions from the Duke, by Messrs. Debenham, Tewson, Farmer, & Bridgewater, for 60,000*l.* after brisk competition. The property covers an area of 16,900 square ft., and has three frontages—viz., about 86 ft. to Hyde Park, 84 ft. to the Knightsbridge-road, and 126 ft. to Park-place.

A CHIMNEY STACK 460 FT. HIGH.—The *Zeitschrift* of the Society of German Engineers contains a description of a high chimney recently erected at the Halsbrückner Hütte, near Freiberg, Saxony. It serves at present for carrying off the obnoxious gases of the calcining furnaces and the blast furnaces, but a connexion is to be made also with the reverberatory furnaces of the works. As the Halsbrücken works are situate in the deep valley of the Mulde, the top of the old chimney stack does not reach to the summits of the surrounding heights. Consequently, at times the smoke from the furnaces lay like a blanket over the neighbouring fields. To remedy this state of things the present chimney stack was designed and erected, its top reaching 138 ft. above the highest summit near. At its base the chimney has a diameter of 33 ft., at its top 16 ft., its inner diameter being 8 ft. It is built throughout of massive claystone, with a facing of marlstone at its base. For ascending the stack during building and afterwards, climbing irons of rod iron 1 in. thick have been inserted outside and inside. They enter the masonry to a depth of 9¾ in., and are, besides, provided with grapple hooks. To carry the gases from the old chimney to the new it was necessary to construct a flue to the new one, partly of wood covered inside with lead, partly of brickwork. This proved rather expensive, and brought the total cost of the chimney up to 6,500*l.* The Freiberg chimney is the highest in the world, the next highest being that at Messrs. Townsend's works, Port Dundas, Glasgow, which is 454 ft. high.

* To be obtained through the New South Wales Agency, 9 Victoria-street.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Labourers' Dwellings	Manchester Corp.	Oldham-rd. Area, 100l. [illegible] Area, 50l.	June 1
*Alterations and Additions to Town Hall	Kendal Corporation	[illegible]	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Painting Works	Brighton Town Coun.	F. J. C. May	Mar. 23
*Making-up Roads and Paving Footways	Willesden Local Bd.	O. Claude Robson	Mar. 24
Main Drainage Works (three contracts)	Queensbury Loc. Bd.	John Drake	do.
Carn Steaming, Blackfolds, Wester Blacks, N.B.	[illegible]	[illegible]	do.
Waterworks, Natal	[illegible]	Gribben & Melvey	do.
Lead Pipes, &c.	Plymouth Corp.	G. D. Bellamy	do.
Gas Fittings Infirmary Buildings	Belfast Union	Young & Mackenzie	do.
Road Metal	Stirlingshire C. C.	W. Paul	do.
*Removal of House Refuse	St. Pancras Vestry	Official	do.
Dwelling-house, Market Raseu	Dr G H Bartrop	W. Watkins	Mar. 23
Manure-mixer, Ravensthorpe	Bywerth R S A.	Official	do.
Sinking an Artesian Well	Aston Manor Loc. Bd.	W. A. Davies	do.
Alterations to Methodist Manse, Donaghadee, Ireland	Rev. Irvine Johnson	J. J. Phillips	do.
Broken Granite and Paving Bricks	Foxt n Local Board	S. A. Goodall	do.
*Underground Convenience	St Martin-in-the-Fields Vestry	C. Mason	do.
*Barge away Dust, Ashes, Refuse, &c	Hand ucrth Vestry	H. Mair	do.
*Widening Road	Horbury Local Board	H. P. Hawcroft	Mar. 24
Shops and Outbuildings	Treharris Co-op Soc. Ltd.	[illegible]	do.
*Cleaning and Painting Lamps, Pillars, &c.	Brighton Town Coun.	F. J. C. May	Mar. 27
Sewer Ring Stone Pipes, &c.	Smetwick Local Bd.	T. C Stuart	do.
Five Cottages, Treorky, Treherbert	D. Williams	[illegible]	do.
Gasholder Tank and Boundary Wall	Bothwell & Uddingston Gas Co. Lim.	L. Rudolph	Mar. 28
Road Materials	Kingsclere High Bd.	Official	do.
Road Metal	Durham County Coun.	[illegible]	do.
Kenyon Stone, Paving, Kerbing, and Water Table	Yeovil Corporation	W. Armytage	Mar. 30
Flint Road Metal	do.	do.	do.
Waterworks	Kirkcaldy and Dysart Waterworks Com.	W. D. Sage	Mar. 31
Removal of Rock under Water	Wick and Pulteney Harbour Trustees	James Barron	do.
Sewerage Works, South Moor	Lanchester U.R.S.A.	J. E Parker	April 1
Alterations and Additions to Church	V. Rev. John Conney Hurworth Burial, &c. Committee	W. H. Byrne	do.
Consolidation of Mains	Pinchley Local Board	Official	do.
Concrete Retaining Walls	West Ham Union	do.	do.
		F. J. Sturge	do.
		Jas Barnard	do.
*Works and Materials	East Grinstead R.S.A.	Lyttal Smith	do.
*Fire Escape Staircases at Workhouse	Cheshire Bay & Great Wirley School Board	[illegible]	April 2
Barn, Steadings, Burnside, Turriff, N.B.			
Sewerage Works			
Additions to School			

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Supply of Timber	G. W. R. Co.	Official	Apl
*Works and Materials (Liverpool Rural District)	War Department	do.	Apl
Waterworks	Rothesay Town Coun.	Leslie & Reid	Apl
*Works and Materials	Southgate Local Bd.	C. G. Lawson	Apl
Main Sewerage Works	Houghton-le-Spring Local Board	D. Balfour	Apl
Thirty-six Houses, Tyr Arlwydd, Mountain Ash (Glam.)	Building Club	[illegible]	Apl
*Raising Building and Constructing Concrete Floor and Roof	Sheffield United Gas Light Co	F. W. Stevenson	Apl
Four Lancashire Steel Boilers, Cast-iron Columns, &c.	do.	do.	Apl
*Stone Kerbing	New Malden Loc. Bd.	T. V. H. Davison	Apl
Cast-iron Socket Pipes and Special	Sunbury Local Bd.	W. B Woodhead & Son	Apl
New Banking Premises, Pudsey and Morley	Yorkshire Banking Co.	F. W. Masters	Apl
Sheds and other Structures, Bolton	Assoc. of Ireland	Wm Hastings	Apl
Waterworks	Dungarvan Twn Com	Official	Apl
*Painting and Cleansing Works	Pen Rhiw Bd. of Guar	Official	Apl
*Cemetery, Chapel, Lodge, &c.	Melton Mowbray L. B.	do.	Apl
Water Supply Works	Swansea U.R.S.A.	John Thomas	Apl
Socket Pipes, Sluice Valves, and Hydrants	do.	do.	Apl
*Works and Materials	Strand Bd. of Works	Official	Apl
*Construction of Storage Reservoir, &c.	Bristol Water Co.	T. & C. Hawksley	Apl
*Road Works	Newtown (N. Wales) Local Board	Official	Apl
Villa, Roundhay-road, Leeds		Hutton & Sons	Apl
Boundary Walls, &c. (Lot 1, Cameron Workington		G Dale Oliver	Apl
Church, Newhall, Byers Green, Durham		J. W. Taylor	Apl
Additions to Schools, Eastham, Ssmall'h, Cheshire		Chapman & Snape	Apl
Number of Small Houses, Armley, Leeds	Ellison Bros.	[illegible]	Apl
Foundation Work, specification, Hebeck	C. & R. Roberts	[illegible]	Apl
Warehouse, Armley, Leeds	Lutas Lashley	[illegible]	Apl
Alterations to Premises, Armagh	[illegible]	Wm. Couser	Apl
Training College Nuneaton	Rev. T. Archbold	[illegible]	Apl
Chapel and School Beatley, nr. Doncaster	[illegible]	C. J. Innocent	Apl
Iron Retort Work	Pumpherston (Glas.) Oil Co. Lim.	[illegible]	Apl
Warehouse at Paul street, Leeds	[illegible]	Thos. Ambler	Apl
Five Houses, Wyke-road, Leeds	[illegible]	R. J. Smith	Apl
Additions and Alterations to Highfield, Horsforth	[illegible]	Fairbank & Wall	Apl

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be sent in
*Road Foreman	Birmingham Corporation	2[illegible]	Mar
*Inspectors of Sewerage Works	Commissioners of Sewers	300l. &c. each	Apl
*Clerk of Works	Islington Vestry	40 week	Apl
*Surveyor and Assistant Surveyor	Condover District Highway Board	150l. and 80l.	Apl

Those marked with an Asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv., vi., and viii. Public Appointments, p. xxi.

MEETINGS.

SATURDAY, MARCH 21.

St. Paul's Ecclesiological Society.—Visit to the Church of Holy Trinity, Chelsea.—Members meet at the Church at 3.30 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." VI.

Edinburgh Architectural Association. — Visit to Gosford House, and Red House.

Glasgow Architectural Association.—Visit to Paisley, Coats Church, &c.

MONDAY, MARCH 23.

Royal Institute of British Architects.—(1) Mr. George Simonds on "Some Aspects of Sculpture in Relation to Architecture." (2) Mr. Arthur T. Bolton on "Mosaics." 8 p.m.

Society of Arts (Cantor Lectures).—Professor R. Meldola, F.R.S., on "Photographic Chemistry." III. 8 p.m.

TUESDAY, MARCH 24.

Institution of Civil Engineers.—Mr. W. T. H. Carrington on "The Reception and Storage of Petroleum Oil in Bulk." 8 p.m.

Society of Arts (Applied Art Section).—Mr. Clement Heaton on "Uses of Cloisonné for Decoration in Ancient and Modern Times." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. A. Wynter Blyth on "Sanitary Laws and Regulations Governing the Metropolis." 8 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

2,223 and 2,224.—GLASS-ROOFING: *J. E. Rendle.*—According to this invention, no cement or putty is used; the glass is placed on purlins, about 2ft. 6in. to 3 ft. apart. The upper portion is placed into wood, grooved out so as to receive it, and the lower portion is secured by metal hooks or clips, fastened to the purlins. A strip of thin lead, of I section, is inserted between the vertical edges of the glass, these being placed in the spaces on each side of the cross-bar, the halves of the I strip being folded against each other, and the upper parts pressed down tightly on the glass. The pane below rests on the purlin, extending about 1½ in. underneath the clips, making a good lap. The ends of the roof are finished off by means of a channelled or grooved wooden bar, which receives the edges of the glass and is covered with flashing.

3,985.—BRICK AND TILE KILNS: *G. Möller.*—In the furnace or kiln to which this specification refers, horizontal channels extend from the bottom of each of the several chambers, to a vertical channel; a removable pipe connects this with the flue common to all the chambers, and leads to the chimney outside the kiln. Special facilities are devised for effectually closing the orifices by lids, luting, &c.

4,738.—SASH AND FRAME: *S. Haslam.*—This invention proposes to effect an improvement on the ordinary sash window by means of pivots fixed at the bottom of either sash. The sashes can be let down at right angles so that the outside of the window may be more easily cleaned.

4,504.—BRICK KILNS: *E. P. Lee.*—By this invention a culvert or flue, common to a series of two or more kilns, is provided, the communication between the kilns and flue being controlled at will. Special provision is also made for conveying off moisture from the goods, and it is claimed that the direction, distribution, and intensity of the heat in the kilns is under more complete control.

1,903.—CHIMNEY-POTS, VENTILATORS, &c.: *R. Roberts.*—The exterior of the pot, &c., which is the subject of his patent is provided with a collar, lip, or ledge, with a number of wing pieces or brackets upon which the wind impinges and causes an up-draught, and at the same time prevents down-draught.

11,377.—CLEANSING DRAINS, &c.: *J. C. Merrywcather.*—To remove the accumulation of solid matter which resists the action of ordinary flushing, it is proposed by this invention to employ a flexible India-rubber pipe with metallic nozzles placed radially at intervals. Any liquid or disinfectant is thus delivered with great force, and effects a thorough cleansing.

11,893.—WINDOWS: *A. & W. Fitton.*—According to the specification, four cog-wheels work in a rack in such a manner that the weight of one sash is the support of the other in any position; as one sash is drawn down the other goes up.

17,616.—RAISING AND LOWERING WEIGHTS: *P. Mitchell.*—It is proposed to use a lifting-chain, the links of which are constructed with peculiarly-shaped teeth, the chain being passed over a suitably-formed sheave or pulley, carried in a suitable block frame, or stirrup. In connexion with the frame is mounted a lever carrying a pawl or catch, adapted to engage with the teeth of the chain in such a manner that when the lever is depressed the weight will be raised. A catch is provided for holding the chain during the time that the lever is being moved back ready for the next lift.

NEW APPLICATIONS FOR PATENTS.

March 2.—3,693, T. Messenger, Lock-latch and Fittings for doors hung vertically.—3,724, R. Hermanns, Constructing Stairways.—3,734, P. Bright, Lavatory Basins, &c.—3,747, H. Snell, Water-closets, Baths, and Lavatories.

March 3.—3,763, C. Zander, Self-locking Apparatus for doors, windows, &c.—3,797, G. Skelsey, Portland Cement.—3,801, C. Jackson, Register Stove.—3,821, W. Thompson, Carving Machines.—3,832, J. Noad, White Lead.—3,833, H. Sturm, Hollow Tiles.

March 4.—3,877, C. Green, Window Ventilation.—3,834, W. Bendall, Bearing Bar attachments for Paint Pots, &c.—3,908, J. Lewis, Fire-places.

March 5.—3,964, T. Crapper, Automatically Flushing Water-closets.—3,966, A. Fulcher, and H. Loosemore, Ventilators and Ventilating Cowls.—3,971, J. Piccaver, Fastener for Doors, Windows, &c.—3,989, A. Boult, Open Fire-place Grates.—3,991, G. Taylor, Chimney Cowls.

March 6.—4,006, T. Hughes, Draught and Rain Excluder for Doors and Windows.—4,014, W. Devoll, Siphons for Flushing Cisterns.—4,016, R. Clayton, Nails.

March 7.—4,102, A. Morison, Locks, Latches for Water-closet Doors, &c.—4,106, W. Hartridge, Preventing the Escape of Smoke from Chimneys.—4,116, W. Cooper, Kilns or Sheds for Drying Bricks, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

82, G. Haskins, Spring for Raising Water-closet Se[illegible]
733, R. Wunsch, Bridges.—937, E. and E. Ath[illegible] Attaching Electrical Wires to Ceiling Roses.—1,471 Henderson, Window Frames and Sashes.—1,852, [illegible] Clark and others, Water-closets and Flushing sam[illegible] 1,955, H. Symons, Securing Slates to Roofs.—1,[illegible] R. Hield, Hinges.—2,013, E. Nobbs, Flushing W[illegible] closets, &c.—2,238, J. Bartlett, Ventilating Cow[illegible] 2,362, H. Wilcox, White Lead, &c.—2,534, W. Par[illegible] Scaffolding.—2,740, F. Prescetto, Flushing Apparatu[illegible] 2,760, J. Nall, Dovetailing Machines.—2,819, J. Nich[illegible] Window Sash-holder.—2,945, W. Withington, Disinfecting Water-closets.—3,031, C. Anderson, Dry Closets.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

3,798, J. Stidder. Fitting Windows, &c.—7,153, [illegible] Stock, Syphon Cisterns,—17,346, J. Haake, Colours [illegible] Distempering.—20,700, H. Lake, Flooring for Stab[illegible] &c.—21,210, A. Boult, Carving and Cutting Machines [illegible] 431, W. Perkins, Mitreing or Bevelling Machines [illegible] Woodworking.—1,666, B. Madler, Door Checks.—1,[illegible] J. Bowles, Saws.—2,071, G. Blanks and another, [illegible] Press for Brick-making Machine.

SOME RECENT SALES OF PROPERTY

ESTATE EXCHANGE REPORT.

MARCH 9.—By *E. E. Croucher & Co.*: 78, Lenth[illegible] rd., Dalston, u.t. 46 yrs., g.r. 4l. 4s., r. 42l., 380l.; [illegible] Charrington-st., Oakley-sq., u.t. 32 yrs., g.r. 5l. 5s., [illegible] By *P. Hodson*: 52, Eleanor-rd., Hackney, u.t. 66 [illegible] g.r. 5l., 260l.; 43, Marquis-rd., Stroud Green, u.t. [illegible] yrs., g.r. 8l., 375l. By *Fenton, Bull, & Coop*[illegible] 60 to 66 (even), Wellington-rd., Stoke Newington, [illegible] 19½ yrs., g.r. 12l., r. 117l., 450l.

MARCH 10.—By *Ramsey & Co.*: 16, Yalding-rd., [illegible] mondsey, u.t. 43 yrs., g.r. 4l., 290l.; 22, Beatrice-[illegible] Southwark-pk-rd., u.t. 47 yrs., g.r. 5l., 275l.—By *Rog*[illegible] *Chapman & Co.*: 133, Alderney-st., Pimlico, u.t. 41 [illegible] g.r. 500l.—By *F. Matthews*: No. 112, Stamford-[illegible] u.t. 74 yrs., g.r. 16l., 1,500l.; 9, Torront-rd., West-gre[illegible] u.t. 94 yrs., g.r. 6l. 10s., 290l.—By *E. Robins & Ha*[illegible] Hartland-rd., Kentish-town, l.g.r. of 37l. 5s., u.t. 48 [illegible] g.r. 4l. 10s., 610l.; l.g.r. of 16l., Hawley-st., u.t. 40 [illegible] g.r. 1l. 7s., 265l.; 73 and 75, Hartland-rd., u.t. 48 [illegible] g.r. 4l. 10s., r. 72l. 10s., 420l.; 9 and 13, Hawley-st., [illegible] 40 yrs., g.r. 1l. 7s., r. 74l., 590l.; 80, Gloucester-[illegible] Regent's-pk., u.t. 62 yrs., g.r. 7l., r. 42l., 355l.

MARCH 11.—By *A. Watson*: 44, Balham-grove, Balh[illegible] u.t. 80 yrs., g.r. 9l., r. 82l., 350l. By *A. A. Hollis*[illegible] *worth*: 94, Locksley-st., Mile End, u.t. 70 yrs., g.r. [illegible] r. 39l., 210l.—By *G. A. Kendall*: 17, 19 and 21, Ricat[illegible] st., Poplar, u.t. 38 yrs., g.r. 12l., r. 48l. 10s., 192[illegible] Sampson-st. and New-rd., Plaistow, l.g.r. of 5l. and [illegible] with reversion in 92 yrs., 215l.—By *Charles & Tub*[illegible] "Salterne," Venner-rd., Sydenham, f., r. 38l., 40[illegible] "Stonecycroft," f., 400l.; 1 to 4, Hope Villas, Gr[illegible] Lanes, f., 750l.; l.g.r. of 75l., Broad Arrow-ct., C[illegible] with reversion in 74 yrs., 1,875l.—By *Walton, War*[illegible] *& Co.*: 2 & 3, Drummond-crescent, Euston-sq., u.t. 9 [illegible] g.r. 21l., r. 121l., 210l.

MARCH 12. By *C. C. & T. Moore*: 23 and 27, G[illegible] venor-st., Stepney, c., r. 50l. 8s., 585l.; No. 292, Old Fo[illegible] rd., u.t. 62 yrs., g.r. 8l., 370l.; 81, Morvill-st., B

2 yrs., g.r. 4*l.* 4*s.*, r. 28*l.* 12*s.*, 175*l.*; 2, Ewing-st., md, u.t. 84 yrs., g.r. 5*l.* 5*s.*, r. 38*l.* 8*s.*, 236*l.*; 2 and -ter., u.t. 19 yrs., g.r. 2*l.* 4*s.*, r. 46*l.* 16*s.*, 216*l.*; 48, rd-st., Commercial-rd., E., u.t. 9 yrs., g.r. 3*l.* 7*s.* 6*d.*, By *Newbon & Co.*: 21, 23, and 25, Blomfield-st., on, f., 788*l.*; 25, Muriel-st., Barnsbury, u.t. 31 yrs., . 5*s.*, r. 30*l.*, 245*l.*; 105 and 107, Bentham-rd., ley, u.t. 56 yrs., g.r. 9*l.*, r. 56*l.*, 510*l.*—By *R. A. kt*: 23, Valentine-rd., Hackney, u.t. 59 yrs., g.r. 4*l.*, 410*l.*; 12 and 14, Brodia-rd., Stoke Newington, 4 yrs., g.r. 12*l.*, 530*l.*—By *R. Chadwick*: 64, nd-rd., Maida Vale, u.t. 72 yrs., g.r. 10*l.*, 440*l.*— *Stimson*: 61, Gurney-st., Walworth, u.t. 51 yrs., . 5*s.*, r. 49*l.* 8*s.*, 500*l.*; 5 and 6, Sutherland-st., u.t. s., g.r. 12*l.*; r. 72*l.*, 325*l.*; 1 and 4 Union-ter. ington, u.t. 52 yrs., g.r. 13*l.*, r. 70*l.* 4*s.*, and g.r. of u.t. 52 yrs., 380*l.*; 5, 67, and 69, Canonbury-rd., on, u.t. 27 yrs., g.r. 12*l.*, r. 130*l.*, 840*l.*; 16, Shaftes- d., Hammersmith, u.t. 62 yrs., g.r. 2*l.*, 700*l.*; sbury-rd., E., u.t. 62 yrs., g.r. 10*s.*, r. 32*l.*, 350*l.*; of 25*l.*, Glebe-st., Chiswick, u.t., 77 yrs., 410*l.*; 15, and 135, St. George's-rd., Southwark, u.t. 11 r. 20*l.* 7*s.* 3*d.*, r. 160*l.*, 460*l.*—By *F. Hazell*: 309, all Bridge-rd., Pimlico, u.t., 33 yrs., g.r. 10*l.*, ; 77, Croxted-rd., Dulwich, u.t. 53 yrs., g.r. 5*l.*, r. 70*l.*

OCH 13.—By *J. Hibbard*: "The Cottage," North- highgate, c. 200*l.*

ctions used in these lists.—F.g.r. for freehold ld-rent; l.g.r. for leasehold ground-rent; l.g.r. for red ground-rent; g.r. for ground-rent; r. for rent; freehold; c. for copyhold; l. for leasehold; e.r. timated rental; u.t. for unexpired term; p.a. for num; yrs. for years; st. for street; rd. for road; square; pl. for place; ter. for terrace; cres. for at; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
art, B.G.		
t n	6/10/0	7/15/0
L. load	3/10/0	4/0/0
C.S.ft. n	2/3	1/6
nada load	2/10/0	4/5/0
o.	0/5/0	0/6/0
	3/10/0	4/15/0
utsic, &c.	2/0/0	3/15/0
	2/10/0	4/10/0
	4/5/0	6/10/0
nada red	2/0/0	3/10/0
llow	2/0/0	5/10/0
ntsic, fath	5/0/0	6/0/0
etersburg	5/0/0	7/0/0
Finland,		
st std.100	7/0/0	10/0/0
h & 3rd..	7/0/0	8/0/0
iga	6/0/0	7/10/0
etersburg,		
ellow ..	9/0/0	14/0/0
d yellow	8/0/0	9/0/0
hite	6/10/0	10/0/0
sh	8/10/0	15/0/0
Sea	8/0/0	16/10/0
Pine 1st	11/0/0	24/0/0
2nd	9/0/0	15/10/0
3rd &c	6/10/0	10/0/0
erce 1st	8/10/0	10/10/0
3rd &		
	6/0/0	7/10/0
rnswick	5/0/0	7/0/0
alkinds	3/10/0	18/10/0
Boards,		
in. prep.		
	0/14/0	0/14/0
d.	0/9/0	0/10/6
qualities	0/3/0	0/7/6
ibia ft.	/4	/4½
ras, &c.	/4	/4½
y, Cuba	/4½	/5½
Domingo		
cargo av	/4½	/6½
an do. do	/4½	/5½
an do. do	/5½	/7
ras do.	/5½	/6½
key ton	4/0/0	13/0/0
	10/0/0	20/0/0
	0/0/0	18/0/0

TIMBER (*continued*).		
Satin, st. Do-		
mingo ft.	0/0/10	0/1/3
Pat. Rio	0/0/9	0/1/6
Walnut, Italian	0/0/4½	0/0/6
METALS.		
Iron Bar, Welsh,		
in L'pool, ton	6/5/0	6/15/0
Do. do. at works		
in Wales	5/15/0	6/5/0
Do. Staffordshire,		
in London	6/5/0	7/0/0
Copper—British,		
cake and ingot	58/0/0	57/0/0
Best selected	60/0/0	60/0/0
Sheets, strong	68/0/0	0/0/0
Chili, bars	52/10/0	0/0/0
Yellow Metal	0/0/6	0/0/6½
Lead—Pig,		
Spanish ton	12/6/9	0/0/0
English, com.		
brands	12/10/0	0/0/0
Sheet, English,		
3 lbs. per sq. ft.		
and upwards	14/5/0	0/0/0
Pipe	14/15/0	0/0/0
Zinc—English		
sheet ton	27/3/0	0/0/0
Vieille Mon-		
tagne	27/0/0	0/0/0
Tin—Straits	90/10/0	0/0/0
Australian	90/15/0	0/0/0
English Ingots	94/10/0	0/0/0
OILS.		
Linseed ton	22/10/0	22/15/0
Cocoanut, Cochin	35/10/0	36/0/0
Do. Ceylon	28/10/0	0/0/0
Palm, Lagos	26/0/0	25/10/0
Rapeseed, English		
pale	29/15/0	30/0/0
Do. brown	28/5/0	0/0/0
Cottonseed ref.	20/15/0	0/0/0
Olein	21/15/0	24/0/0
Lubricating, U.S.	6/0/0	7/0/0
Do. refined	7/10/0	8/10/0
Tar—Stockholm		
barrel	1/1/6	1/2/0
Archangel	0/14/6	0/0/0

TENDERS.

Next week communications for insertion under ading must reach us *not later than* 12 *noon on day*, as we go to press a day earlier than usual.

NGARW (Glamorganshire).—For additional accommodation hildren at Blaengarw Schools, for the Llangeinor School Mr. George F. Laubert, Architect, Town-hall, Bridgend. by the architect.

..... £2,700	Evans Matthews £2,183
..... 2,485	J. D. Williams..... 1,899
..... 2,420	D. C. Jones & Co., Gloucester(accepted) 1,794

[Architect's estimate, £2,380.]

BROOK (Northants).—For the repamtion of All Saints' Braybrook. Messrs. John Giles, Gough, & Trollope, Archi- Craven Street, W. C.

..... £1,085 15 0	E. Brown & Son..... £962 0 0
Dickree... 1,075 0 0	Claridge & Bloxham... 885 0 0
low..... 1,047 0 0	

FORD.—For erecting isolation hospital, administrative hortmary, boundary wall, &c., at Clayponds-lane, Brentford. entford Local Board. Mr. J. H. Strachan, Surveyor :—

..... £4,965 4 6	H. J. Heywood £4,570 0 0
..... 4,273 0 0	Thos. Turner, Ld.. 3,987 0 0
..... 3,977 0 0	Flint & Co. 3,954 0 0
..... 3,890 0 0	W. Nye 3,852 0 0
..... 3,875 0 0	Allen & Sons, Kilburn* 3,691 0 0
& Co. ... 3,857 0 0	R. G. Batley..... 3,574 0 0

* Accepted.

TON (South Wales).—For building a steam laundry at for the Barry Dock Sanitary Steam Laundry Company, Messrs. Bruton & Williams, architects, Cardiff :—

ries..... £1,695 0 0	Lawrence, Perry-
..... 1,490 0 0	man & Waller £1,389 10 0
& Pearce 1,434 12 0	E. J. Ines 1,253 0 0
	W. Crisp 1,195 0 0

HILLY.—For re-instating (after damage by fire) of villa known as "The Mount," Caerphilly. Messrs. Bruton & architects, Cardiff :—

..... £825 0 0	E. Hedges £695 0 0
Perryman,	Fraser & Kastell 605 10 0
..... 778 0 0	Frederick Darke 553 0 0
Thomas . 689 12 0	

ALTON.—For erecting house in Ringstead-road, Carshal- Wm. Smith. Mr. Geo. Jackson, architect and surveyor. cross :—

Son..... £2,450	Kelland (accepted)..... £2,150
Bros..... 2,300	Johnson 2,140
..... 2,238	

CHELMSFORD.—For erecting five small houses. Mr. Rd. Mawbard, architect, Chelmsford :—

T. Goldfinch, Whitstable (accepted)	£1,125 0 0

CLACTON-ON SEA.—For the erection of a villa residence in St. Paul's-road, Clacton-on-Sea, Essex (exclusive of stoves and chimney-pieces, bath, and fencing), for Mr. Horace R. Spence. Mr. G. Warren Cooper, architect, Bedford House, Bedford-row, W.C. No quantities supplied :—

Walker & Sergeant	£906 Henry Everett & Son, Col-
Stephen Goodall.....	742 chester (accepted) £715
	Norman De Maid..... 700

CLACTON-ON-SEA.—For the erection of a villa residence in St. Paul's-road, Clacton-on-Sea (exclusive of stoves and chimney-pieces, bath, and fencing), for Mr. James G. White. Mr. G. Warren Cooper, architect, Bedford-row House, Bedford-row, W.C. No quantities supplied :—

Wilmot Sergeant	£775 Norman De Maid £675
Stephen Goodall.....	690 Henry Everett & Son * 570

* Accepted

CLACTON-ON SEA.—For the erection of a villa residence in St. Paul's-road, Clacton-on-Sea (exclusive of stoves and chimney-pieces, bath, and fencing), for Mr. Walter Young. Mr. G. Warren Cooper, architect, Bedford-row House, Bedford-row, W.C. No quantities supplied :—

Wilmot Sergeant	£781 Norman De Maid £61
Stephen Goodall.....	724 Henry Everett & Son * 530

* Accepted

CROYDON.—For alterations to No. 11, Hill-street, Croydon, for Messrs. Grant Brothers. Mr. Alfred Bros., architect, 11, Hill-road, Croydon.—

Bass	£983 15	Leigh & Funnell	£794 0
Peel	980 0	Stancliffe	785 0
Parker	914		

* Accepted.

[All of Croydon.]

EDGWARE.—For the erection of a new Police-station at Edgware, for the Receiver for the Metropolitan Police District. Mr. John Loveless Roberts, New Scotland yard. Quantities by Mr. W. H. Thurtell.

	Cost.
Patman & Fotheringham	£2,462 .....
Scrivener & Co.	1,797 .....
Grover & Son	1,771 .....
C. Nash	1,727 ..... £50
Luther Brothers	1,721 10
Wilmott & Sons	1,688 10

GREAT STANMORE.—For the erection of a pair of cottages on the estate for Mr. Frederick Gordon. Messrs. Young & Hall, architects, 17, Coleman-street, E.C.—

Messrs. Kirby & Sons, Stanmore (accepted)	£414 0 0

HALIFAX.—Accepted for the erection of fourteen dwelling-houses at Highroyd Banks, Messrs. C. F. L. Horsfall & Son, architects, Lord-street-chambers, Halifax. Quantities by the architects :—

Masons Edward & Akroyd, Stainland	£1,260 14 0
Joiners J. Cockson, Stainland	530 0 0
Slaters J. Stafford, Sowerby Bridge	170 0 0
Plumbers and Glaziers T. Collins, Trooper, Hallerseild	230 0 0
Painters G. L. Lockwood & Son, Halifax	50 0 0
Plasterers G. Greenwood & Sons, Halifax	70 0 0

HARROW-ON-THE-HILL.—For stabling at Mountside, Harrow, for Mr. R. T. Hargreaves. Mr. F. N. Cowell, architect and surveyor, Harrow.

Arthur Dashwood & Sons	£210 0 0
Alfred Webb	200 0 0
W. B. Walker, Harrow (accepted)	179 0 0

HIGHGATE.—For erecting forecourt cottage at Highgate Depot, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor :—

E. Kemp & Son	£420 0 0
Chessum & Son	398 0 0
B. Cooke & Co	349 9 3
F. Yoder	333 19 0
Wilmot Sergeant	£305 0 0
Wallis & Sons	285 0 0
Hitchins*	274 0 0

* Accepted.

HORNSEY.—For erecting new ward block at the Infirmary, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor :—

E. Kemp & Son	£1,600 0 0
John Allen & Sons ..	1,491 0 0
William Wells.	1,465 0 0
F. Yoder	1,426 8 0
B. Cooke & Co	1,415 0 0
Chessum & Sons ..	£1,377 0 0
Wilmot Sergeant ..	1,365 0 0
Hitchins*	1,314 0 0
J. O. Richardson ..	1,273 0 0

* Accepted.

HORNSEY.—For new sewers, Muswell-hill-road to Archway-road, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor :—

Thomas Adams	£2,854 2 0
J. Bloomfield	2,824 0 0
T. H. Durtnell	2,816 0 0
George Bell	£2,630 0 0
B. Cooke & Co..	2,574 0 0
Patterson* ..	2,414 0 0

* Accepted.

HORNSEY.—Accepted for making-up of private roads, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor :—

Clifton-road.—Cooke & Co., Church-road, Battersea	£1,283 15 2
Avenue-road.—Jas. Blundell, Tottenham	644 0 0
Wightman-road Griffiths, Lewis, & Co., Millwall	1,343 13 0
Addington-road.—A. Walker, Holloway.....	765 0 0
Denmark-road.—A. Walker, Holloway.....	630 0 0
Umfreville-road.—A. Walker, Holloway	729 0 0

HORNSEY.—Accepted, on schedule of prices, for the supply of materials and labour as hereunder stated, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor :

Paving, Granite, and General Macadamising Materials.
W. Griffiths, Kingsland-road.

Broken Granite and other Road Materials.
W. Griffiths, Kingsland-road (for broken granite).
Wm. Walker, Holloway (for other road materials).

Sewer Jobbing Work.
T. G. Dunmore, Crouch End.

LEEDS.—Accepted for the erection of a mission room, class-room, caretaker's house, &c., Church-street, Hunslet. Mr. Geo. F. Danby, architect, 46, Great George-street, Leeds :—

Bricklayer—B. Hutchinson, Elland-road, Leeds.....	£640 0 0
Joiner—Joseph James, Hunslet, Leeds	376 0 0
Slater—J. W. Richmond, Hunslet, Leeds	63 0 0
Plumber—J. Cockerill, Hunslet, Leeds	114 0 0
Plasterer—W. Pennington, Woodhouse, Leeds....	44 0 0
Painter—M. Welham, Leeds.....	24 0 0
Total	£1,251 0 9

LEEK.—For sewering, levelling, forming, paving, &c., of Brunswick-street, for the Commissioners. Mr. J. Nyatt, Town surveyor :—

J. W. Critchlow, Leek	£405 7 11
T. Gratrix, Leek	375 0 0
F. Burke, Stoke on Trent* ..	326 7 5
Williamson & Son, Macclesfield	320 0 0

* Accepted.

LOCH AWE (Argyllshire).—Accepted for additions to the hotel at Loch Awe, Argyllshire, for Mr. Duncan Fraser. Mr. John Young, architect, Perth :—

Mason and Iron Works—Fraser & Morton, Perth	£2,140 19 11
Carpenter, Joiner, and Glazier Works—James Hay & Son, Perth	1,934 15 2
Plumber Work James McLeish, Perth.	716 13 0
Plaster Work Alexander McRitchie, Dundee ..	417 13 8
Slater Work—James Buchan, Perth	107 0 0
Bells and Lift—Westwood & Sons, Perth.	73 2 6

LONDON.—For the erection of a Free Public Library, Whitechapel. Messrs. Potts, Sulman, & Hennings, architects, 1, Furnival's Inn, E.C. Quantities by Mr. Geo. Fleetwood, 15, Furnival's Inn, E.C. :—

	Entire Fitting for Floor.
J. Catley	£7,451 .....
J. Morter	7,400 .....
W. Brass & Son.	7,393 ..... £27
W. Shurmur	7,366 .....
Willmott & Sons	7,355 302
A. Eaton & Co.	6,990 .....
Holloway Bros.	6,943 250
Ashby & Horner	6,875 280
Scrivener & Co.	6,825 280
T. Little	6,771 27
M. Gentry	6,767 27
J. R. Hunt	6,750 280
Perry & Co.	6,525 27
Coals & Brass	6,500 317
Richardson Bros.	6,364 255
F. & F. J. Wood	6,347 27
Harris & Wardrop	6,342 300
J. Allen & Sons	6,341 300
Chessum, & Sons	6,340 300
W. Gladding	6,317 250

LONDON.—For making up the carriage-way of Melgund-road and Witherington-road, Highbury, for the Vestry of Saint Mary, Islington. Mr. J. Patten Bazley, C.E., Engineer and Surveyor :—

	Melgund-road.	Witherington-road.
	Total.	Total.
Rutter & Son	£ s.	£ s.
George Bell	328	480
Wilkinson Bros.	303	450
James Pizzey	320	422
William Griffiths	303	401
Thomas Adams	298	395
Asphalt & Son	295	44
Walkers	283	37
Cleeve & Co.	282	37
F. & J. Godson	281	37
W. Walker, Upper Holloway	280	37

* Accepted.

LONDON.—For [illegible] at the premises, 121, Queen Victoria-street. Mr. T. L. Smith, architect :—

Ryder	£4,[illegible] Lathey ..... £3,[illegible]
Colls	4,[illegible] Lascelles ..... 3,[illegible]
Grover	4,[illegible] Smith ..... 3,[illegible]
Woodward	3,[illegible] B. L. Nicholay ..... 3,[illegible]
Shepherd	3,[illegible]

LONDON.—For the [illegible] of the premises, Nos. 54 and 55, Piccadilly, W., for Messrs. Hoare Bros. Messrs. Young & Hall, architects, 17, Coleman-street, E.C. Quantities by Messrs. Gribble, Son, & Tubbs, 110, Cannon-street, E.C. :—

Johnson Brothers	£4,[illegible] Holliday & Greenwood ..... £3,[illegible]
J. & W. Patman & Son	3,[illegible] J. Wall & Co. ..... 3,[illegible]

LONDON.—For [illegible] and rebuilding Nos. 54 and 55, Piccadilly, W., for Messrs. Hoare Bros. Messrs. Young & Hall, architects, 17, Coleman-street, E.C. Quantities by Messrs. Gribble, Son, & Tubbs, 110, Cannon-street, E.C. :—

Johnson Brothers	£4,[illegible] Holliday & Greenwood ..... £3,[illegible]
J. & W. Patman & Son	3,[illegible] J. Wall & Co. ..... 3,[illegible]

LONDON.—For [illegible] and [illegible] premises, Chiswell-place, Bishopsgate-street, for Messrs. Hoare Bros. Messrs. Young & Hall, architects, 17, Coleman-street, E.C. Quantities by Messrs. Gribble, Son, & Tubbs, 110, Cannon-street, E.C. :—

Clarke & Son	£4,[illegible] Lascelles & Co. ..... £3,[illegible]
Ashby & Horner	4,[illegible] Lathey ..... 3,[illegible]
Holl, Bovill, & Co.	4,[illegible] Lawrence & Sons ..... 3,[illegible]
Colls	4,[illegible] Shillitoe ..... 3,[illegible]
Ryder	4,[illegible] Ellerby & Sons ..... 3,[illegible]
Ashby Brothers	3,882 Holliday & Greenwood ..... 3,[illegible]

LONDON.—For alterations & [illegible] Gas & Water Fitting, &c., at No. 5, Clapham-road, for Mr. F. W. Lee. Messrs. Bunstone & Castell, Architects :—

H. Childs & Sons	£[illegible] Lathey Brothers ..... £[illegible]
Woodward & Co.	[illegible] Holliday & Greenwood ..... [illegible]
Greenwood & Son	[illegible]

LONDON.—For restoration after fire to premises, 47, Clapham-road, Park-road. Mr. Turk Lacey, architect :—

Hollingsworth	£[illegible] Higgs ..... £[illegible]
B. E. Nightingale	[illegible]

LONDON.—For alterations and repairs to the "Offord Arms," Caledonian-road, N. Messrs. Bunstone & Castell, Architects :—

B. E. Nightingale	£2,[illegible] Scrivener £2,550
Ryder	2,[illegible] Mowlem ..... 2,[illegible]
Toms	2,[illegible] Shillitoe & Co. ..... 2,[illegible]
G. Coles	2,[illegible] Nightingale ..... 2,[illegible]

LONDON.—For the erection and completion of superstructure of factories, Baldwin's-gardens, Gray's Inn-road. Mr. W. Graves, architect :—

Holl and & Hannen	£3,127 Wall & Co. £2,741
Brass & Son	2,988 Harris & Wardrop 2,742
Grover & Son	2,[illegible] Lawrence & Sons 2,719
B. E. Nightingale	2,781

LONDON.—For alterations to the "Prince's Head" public-house, York-road, Battersea, for Mr. J. J. Calder. Mr. W. Seckham Wither ington, architect, 75, Mark-lane, E.C. :—

Kirk & Gayford	£839 Drew & Cadman £704
Kearley	834 Little & Seneral (accepted).. 681

LONDON.—For dilapidations and decorating 30, Pembroke-gardens, Earl's Court, S.W., for Mr. T. Parker. Mr. H. J. Newton, architect, 49, Victoria-street, Westminster, S.W. :—

C. Kearley	£488 J. Barker & Co. £347
C. Bearman & Son	381 Leslie & Co., Kensington
P. Mark	354 square (accepted) 340

LONDON.—For pewterers' work at the "Daniel Lambert" Hotel, Ludgate-hill, E.C., for Mr. R. H. Barnes. Mr. H. J. Newton, architect, 49, Victoria-street, Westminster, S.W. :—

Watts & Co.	£207 10 Sanders & Sons, High
T. Heath	191 0 Holborn* £147 10
W. Helling..	177 0

* Accepted.

LONDON.—For alterations and additions to factory at rear of 55½ Old Kent-road, for Mr. G. W. Miller, 132, New Kent-road, S.E. :—

Larkin	£150 A. & W. Gatman, Peckham* .. £145

* Accepted.

LONDON.—For alterations, &c., to 11, Hill-street, Berkeley-square, for the Duke of Newcastle. Mr. Charles Bell, architect, 3, Sidney-street, Cannon-street :—

Kent	£230 Hatfield* £180
Cass. Wall	195

* Accepted.

LONGTOWN (Cumberland).—For building two bridges of 50 ft. span each, at Breakings, Stapleton, for the Highway Board. Mr. Richard Maxwell, surveyor, Longtown :—

Thos. Telford, Langholm, N.B. (accepted)	£1,245 0 0

MORLEY.—For laying cast-iron water-pipes, erection of bridges, &c., in connexion with the Morley Waterworks, for the Corporation. Mr. Charles Gott, Engineer, 8, Charles-street, Bradford :—

A. Brown & Son	£17,458	J. Schofield, Sons, &	
Parkinson & Bower	16,510	Co.	£8,976 16 10
Slinger & Naylor ..	16,726	Matthew Hall.....	8,970 19
E. Kellett	13,420	David Barry, Rod	
H. Vickers	11,843	cliffe-on-Trent,	
J. & T. Young	10,984	near Nottingham*	8,022 10
H. Fotherby & Son	9,237		

*Accepted.

[In our issue of the 7th inst. the list of tenders received for the *Supply* of the cast-iron pipes was headed by mistake for *Laying* the pipes.]

WITHINGTON (Lancs.).—For the severing, paving, flagging, &c., of York-street, Albany-road; No. 1 Passage, Hope-street; No. 2 Passage, Albany-road; and No. 2, 4, and 6 Passage, Keppel-road, Withington, for the Withington Local Board:—

	York-street.	Albany-road.	No. 1 Passage, Hope-street.	No. 3 Passage, Albany-road.	No. 2 Passage, Keppel-road	No. 4 Passage, Keppel-road	No. 6 Passage, Keppel-road
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Matthew Naylor, 54, Mytton-street, Hulme, Manchester	746 13 8*	1,074 2 3	14 8 8*	39 3 7*	17 8 8*	17 8 8*	33 9 8*
William Hammett, Ashton-on-Mersey, Cheshire	350 14 4	1,113 6 8	17 16 6	43 17 11	19 10 7	19 10 7	39 6 0
W. Snape & Sons, Eccles	396 11 4	1,152 11 5	18 15 6	40 1 2	17 16 4	17 16 4	35 18 0
George Clarke (Bridge) street, Hulme, Manchester	361 17 2	994 13 8*	17 10 0	41 4 4	18 5 8	18 5 8	35 18 0
Withington & Fallowfield, Rusholme road, Manchester	384 0 11	1,200 8 2	17 17 3	43 12 0	19 8 0	19 8 0	39 0 0
William Clarke, Dearden-street, Hulme, Manchester	388 10 7	1,105 10 8	18 9 9	43 8 5	19 2 10	19 2 10	38 18 9
W. H. Ibberson, Cheetham Hill, Manchester	410 0 0	1,125 0 0	16 12 0	43 10 0		56 0 0	—

* Accepted

NEWMARKET.—For the erection of house and offices, for Mr. J. Watts. Messrs. Roberts & Gordon, architects, Welford-place, Leicester

Enoch Hind, Nottingham (accepted) £4,968 0 0

NORTHAMPTON.—For the erection of a house and premises, at Cogenhoe, for Mr. W. A. Mason. Messrs. H. H. Dyer & Son, architects, Newland Chambers, Northampton:—

Adnitt & Durrad	£1,795	J. T. Wingrove	£1,672
G. Heyes	1,750	Woodland & Son	1,670
Green Bros.	1,740	J. C. Sharman	1,612
A. P. Haslen	1,730	Clayton Bros.	1,605
G. J. Fisher	1,725	G. White, Northampton*	1,602
E. Archer	1,687	* Accepted.	

PORTADOWN (Ireland).—For building a new chimney at the gas-works, for the Gas Light Company:—

R. M. Beattie	£90 0	Bright Bros., Portadown*	£62 10
Richard Sutton	£105 0	* Accepted.	

PORTISHEAD.—For the erection of house and shop at Portishead, near Bristol, for Mr. E. F. Frowde. Messrs. Hunt & Young, architects:—

Green	£880	Thomas, Portishead*	£663
Biss	681	* Accepted.	

RUNCORN.—For the erection of a new Institute, for the Mersey Mission to Seamen. Mr. John Wilson, architect, Greenway-road, Runcorn:—

W. Pace (& Son)	£1,050	Henry Coward, Runcorn*	£1,045
Wilson & Sefton	1,048	* Accepted.	

SHEFFIELD.—For the erection of new Municipal Buildings, for the Corporation. Mr. Edgar W. Mountford, architect, 17, Bucking-ham-street, Strand, W.C. Quantities by Mr. E. C. Pinkes, 43, Parliament-street:—

	Corbenick Stone for exterior.	Stake Hall Stone for exterior.	Huddersfield Stone for exterior.
Graham & Son	£92,822	£90,772	£85,172
Nicholson & Son	91,903	91,014	90,194
Rees, Blight & Co.	89,488	90,718	84,820
Lowe & Sons	89,730	91,000	94,850
Rudd & Son	88,500	84,740	92,150
Henry Lovatt	88,441	86,541	86,941
Armitage & Hodgson	84,600	87,048	87,048
John Jowett	82,367	85,497	87,547
Edmund Coblatt, Liverpool	81,945	85,340*	87,945
Shillito & Son	81,760	84,570	89,750

* Accepted.

STRATFORD.—For erecting new factory and warehouse at Sugar House-lane, Stratford, E., for Messrs. Usher & Co.:—

Gould & Brand	£785	H. M. Dove, Watford*	£675
W. H. Lascelles & Co.	686	* Accepted.	

TOTTENHAM.—For constructing a cellar under the "Black Boy" Hotel, for Mr. C. W. Tann. Messrs. Hudson & Whitehead, architects, 7, Finsbury-square, E.C.:—

M. A. Brown & Co., Belmont road, West Green (accepted) £223 0 0

WEST GREEN.—For the erection of seven houses on the Wood lands Park Estate, West Green, for Messrs. Hudson & Elphick:—

Chas. Dang	£3,150	E. Bowdler & Son	£2,648
Chessum	2,975	Payne & Son	2,595
Pierce & Co.	2,725	Percy Hart	2,280

WILLESDEN.—For the erection of a hall at Willesden, Mr. C. Bell, architect, 3, Salters'-hall-court, Cannon-street:—

Batchelor	£4,450	Dearing & Son	£3,997
Dove Bros.	4,325	Mills	3,940
Grover & Son	4,280	Allen	3,887
Scrivener	4,124	Bridson	3,927
Amey	4,120		

WRITTLE (Essex).—For erecting twelve cottages. Mr. Ed. Mawhood, architect, Chelmsford

W. Baker, Danbury (accepted) £1,329 0 0

Foreign Statistics at St. John's Hall, Lambeth.—Messrs. B. C. Badham & Co., of Featherstone Buildings, High Holborn, ask us to say that they tendered for these at £1,067, and that their name should be substituted for the name "Baker," which was a mistake. The mistake was not ours.

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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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The Builder.

Vol. LXI. No. 2512 — Saturday, March 28, 1891.

ILLUSTRATIONS.

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Tower of San Pedro, Seville.—From a Drawing by Mr. H. V. Lanchester ..... *Single-Page Ink-Photo.*
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Ground-Floor Plan of the Selected Design for the Battersea Polytechnic Institute ..... *Single-Page Ink-Photo.*
Bronze and Marble Well-heads, Venice: Renaissance.—Drawn by Mr. Richard Glazier ..... *Single-Page Photo-Litho.*
Swedish Houses of Parliament and Bank of Sweden: Side Elevation and Plan.—Herr Zettervall, Architect ..... *Double-Page Photo-Litho.*
Principal Elevation of the Swedish Houses of Parliament.—Herr Zettervall, Architect ..... *Single-Page Photo-Litho.*
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Architectural Studies in France.

IT is not often found that books upon architecture, written in an earlier period of the century, will bear republication thirty or forty years later. Travelling for the sake of architectural study has so much increased of late that what was new to the architectural student in the 'fifties is everybody's property now. The changes in architectural taste and predilection have been so rapid, moreover, that what seems specially worthy of study to one generation is liable to be passed over as of secondary importance by the next one; added to which, the manner of illustrating architecture, both in regard to the special points to be illustrated and the method of delineation, has been even more changeable, and the taste in this latter respect varies by decades rather than by generations. There are monumental illustrative works on architecture which will always retain a high value, but which are hardly susceptible of republication; works consisting mainly of large and elaborate drawings which are the personal productions of their authors.

Among the smaller works which are more in the nature of illustrated treatises there are some which have kept their place and interest remarkably well, though they are perhaps rather works for general readers interested in the subject than for architects, and in connexion with Gothic architecture some of these have been the work of amateurs. Parker's Glossary and Bloxam's Gothic architecture are still excellent introductions to the study of English Gothic; much has been learned since they were produced, but they are well written and correct as far as they go. The Rev. J. L. Petit's "Architectural Studies in France," which now reappears,* is a book of the same class, by a man who was at once an able literary writer, a careful observer, and a really artistic sketcher, and possessed moreover a sufficient theoretic knowledge of construction. Petit had the merit, too, of having broad views in regard to the relations of architectural style, and was one of the first to perceive that the study of French Gothic was essential to the subject, and that Gothic could not be taken up as if it were an English style merely. His book would hardly be considered an architect's study-book nowadays, but it is a very good introduction to the subject for students and for general readers; and even from the architect's point of view, except for the almost entire absence of plans, which is a serious defect, it does not compare badly, for the time it was written, with Street's "Gothic Architecture in Spain," published eleven years later; and, except for the deficiency just alluded to, may be said on the whole to be as well illustrated.

The original preface to the work is of considerable interest, and shows Petit's breadth of observation and of principle in regard to architecture, and the degree in which he was in advance of many of the teachers of his own day. Our object, he says, is not to produce a building which might be mistaken by the antiquary for a specimen of a particular period or country, but one fitted in every respect, in reality as well as in appearance, for its purpose. "If in our attempts to attain this we make use of ancient examples, we must discriminate carefully between features which are simply characteristic of date or country, and true architectural principles:" a doctrine which is certainly not superfluous now. We have for the most part left off treating Gothic in this way, but only to adopt the same imitation of accidental features in much of the "free Classic" of the day, where we see the accidental combinations of features belonging to different dates and styles, in old buildings which have been altered at various periods, deliberately reproduced in new buildings, for the sake of piquant effect. Petit saw clearly too, what some people in the present day are losing sight of, that a great building may be produced with no other decoration than that afforded by strictly architectural detail, by which he means mouldings, as distinct from carved work. In his time it was the custom for writers on Gothic to speak of "dogtooth moulding," "beakhead moulding," &c.; he admits this slip himself, as a concession to habit, but repents of it, and claims that "moulding" should be restricted to its true and distinctive meaning, and observes that "it is on this class of ornament that the style must depend principally for its character; because a building may be very perfect, rich and beautiful, that employs no other."

It is still more to the credit of the author's insight and advanced stage of criticism at that period, that he strongly condemns that imitation Mediæval sculpture, the futility of which some people have not even yet found out. His testimony on this point, made so many years ago, is worth quoting:—

"It may be said that some Mediæval statues have a grace and dignity that it would be difficult to find in later work. Most probably. Their sculptors worked in earnest, and undoubtedly attained a high degree of excellence. Still, I think I shall not be contradicted when I again assert, that no sculptor, anxious to advance his own reputation and his art, will ever set up a Mediæval statue as his model. He may acknowledge its merits, and learn much from a careful examination of it; but still he will not look up to its designer as his master and guide. When I say a Mediæval statue, I mean one fairly expressive of the character of modern Gothic statuary, such as would in the present day be considered suitable to a Gothic building. If this be so, I repeat that unless we can adapt our Gothic to the requirements of art, according to our highest acknowledged standard, in such manner that there shall appear to be no incongruity between the architecture and the sculpture, we ought to abandon it altogether, as a style calculated to repress rather than to encourage, advancement to perfection."

To come however to Petit's studies in France. These consist of remarks upon churches in France, taken during a tour the precise direction of which does not seem to have been guided by any previous plan, but in the course of which the writer described and in many cases illustrated by sketches, about three hundred churches. The notes are confined to churches; a fact significant of the period; in the present day châteaux would be regarded as at least of equal consequence. The first chapter contains some general critical remarks on French Gothic and its special characteristics. Some of the remarks in this chapter are worth a note. While ob-

* Architectural Studies in France, by the Rev. J. L. Petit, M.A., F.S.A. With illustrations from drawings by the author and P. Delamotte. New edition, revised by Edward Bell, M.A., F.S.A. London: G. Bell & Sons. 1890.

serving that in the earlier French work "the squareness of the general sections, and the monotony of the mouldings . . . . give an expression of severe dignity which cannot fail to produce its effect on the spectator,' the author remarks that the contrast between French and English work is even more marked in the small churches than in the cathedrals, and that a French architectural student would be as much struck, and would learn as much on visiting a group of English churches in Lincolnshire and Nothamptonshire, as an English one by a corresponding group of French churches. We fear French students of architecture seldom put this to the test. In pursuing the comparison, Petit observes very truly that "The former [the English parish churches] exhibit a depth, purity, and delicacy in mouldings, a studied elegance in the tracery of windows, a symmetry of outline and refinement in proportions, with a careful exclusion, from an early period, of every incongruous element, which are not so apparent in the French specimens." The author comments also on the poor appearance of the small and plain French churches of the flamboyant period, as compared with the very respectable architectural dignity of even the more unadorned English churches of the Perpendicular style.

As to the tour itself, it was apparently controlled not entirely by architectural considerations, though the author finds that had not his steps been drawn aside by other inducements he would have missed some of the monuments that interested him most. A remark in the general introductory chapter about the influence of rivers is worth note. The author records that he met with the best examples and in the greatest number on or near rivers, and when he traversed the dry tract of land to the north of the Loire, he found little to repay him; and in England he asks who has not in his rambles tracked the course of a stream from village to village, finding here a spire and there a manor house, &c. "Depend upon it, there is a great analogy between the pursuits of the fly-fisher, the artist, and the antiquary."

The greater portion of the sketches and notes have reference to the South of France, with a chapter added, later on, on "The Seine and Normandy." Loches and Beaulieu occupy the fourth chapter; Loches with its strange stone pyramids growing out of the back of the nave, like the humps of a camel, and its broad flat transverse arches strengthening the barrel vault internally. This chapter is extensively illustrated; it is rather strange to find the remarkable castle not even adverted to; but as before said, churches were the special object.

In a chapter on the geometry of vaulting the author takes rather a curious line of reasoning in regard to the formation of the diagonal ribs in Early Gothic vaulting. According to his view, the Early Gothic builders intended theoretically to use, and did in some cases (he does not give examples) actually use the mathematically correct elliptical curve for the diagonal rib, but soon discarded it for the use of adjusted curves which were more easy of execution, when once the idea of interpenetrating vaulting surfaces was abandoned for that of a structure of ribs with a filling between them. And he suggests that while the primary conception of the vault with an elliptical diagonal rib was theoretically correct, the departure from it involved no abandonment of a principle: "The false ellipse, made up of circles of different curvature, was soon substituted, and this substitution was actually an improvement." But this, he argues, does not alter his view of the case. "The imitation of the true curve proves that its propriety was recognised. Had the original designer of a cross vault with horizontal ridges made the diagonal rib a mere segment of a circle, he would have been guilty of a barbarism;" and he goes on to observe that one great excellence of exact design is that "it often provides for a wide licence as regards inexact workmanship." It appears to us that the contrary is the case, and that the maintenance of a mathematically true principle as regards the adjustment of parts of a design specially necessitates exactitude of workmanship. Certainly that is the way a Greek would have looked at it. As far as Gothic architecture is concerned, no sooner did the use of the pointed arch set the builders free from the necessity for endeavouring to accommodate circles of different radius to each other, than the idea of a scaffolding of vaulting ribs superseded the idea of interpenetrating surfaces, and then the design of the vault became a matter of convenience and effective appearance rather than of mathematical adjustment. The substitution of the stilted for the elliptic arch in the diagonal ribs, forming a kind of nook above the impost, gives, as Petit remarks, "amazing force and character to a Gothic vault." It does so, no doubt, at the cost of some confusion and difficulty in making a workmanlike junction of the ribs on or over the impost; but it is an entire throwing overboard of everything like theoretically correct design.

In the chapter on the domed churches of Perigueux the author observes that perhaps no building in existence shows the principle of composition and construction so undisguisedly as the cathedral of Perigueux, "a building which gives the idea of being thrown off as a rough and grand sketch, the filling of it up being left as a problem to future architects." He gives a view of the exterior of the domes as seen under the roof subsequently put over them. In regard to the broad arches supporting the base of the domes, he observes rightly that these are essentially portions of pointed barrel vaults, interrupted by the springing of the dome, and asks why they are at this early date pointed, when their exemplar, St. Mark's, carries out the problem with round arches. The Perigueux building is essentially Romanesque, not Gothic, yet the Gothic pointed form is adopted. Petit suggests that the intention of building the church with a genuine stone roof led to the adoption of the pointed vault for the interior, as working in better with the exterior form of the ridged roof, and this is probably the true explanation. He suggests also the idea that it was adopted in order to give greater strength for the support of the dome; but in such rude and naïve building as Perigueux cathedral really is, the simpler and more obvious motive seems the more probable one. Anything more ugly than the exterior domes of St. Front must have appeared in their original state has perhaps never been constructed in a building of this importance; they have the merit of constructive unity, but the builders had not mastered the problem of combining this with architectural beauty and fitness. In the interior it is otherwise, and it is interesting, as Petit says, to speculate what the interior design of St. Front might become if treated in a less rude and primitive manner. The piers, consisting on plan of four separate square masses, forming in elevation a group of four plain piers connected by semicircular arches near the top, leaving a high narrow open arch on each face, are rude enough in design; but, as the author observes, they are remarkably suggestive to the architect: "might they not, instead of being compressed into mere pilasters, be developed into grand masses, affording a marvellous breadth of effect, and capable of receiving the most varied enrichment?" Petit suggests that Wren actually did something like this in his famous model for St. Paul's, where we see "the arch compartment expanded into a wide cylindrical roof, and the pier compartment of sufficient width to exhibit a fine arched recess between columns crowned with a rich entablature." This, however, is hardly the way to bring out the inherent grandeur of the Perigueux design. It would not be a bad subject to set for a students' competition, to take the lines of the interior composition of St. Front and give them a decorative treatment in harmony with the spirit of the building. No doubt, as Petit says, "Perigueux could easily be put into revival Italian," but it is to be feared that its special impressiveness would be a good deal impaired under the process. On the other hand, asks the author, could St. Paul's [the design of the model] be put into Romanesque? "Can an interior similar in its composition, in its distribution of light and shade, and in the grandeur of its architectural masses, be produced in a pure, consistent, and refined round arched style? If so, it is surely worth while to try and solve the problem." It certainly would be, and Petit is to be thanked for having left this suggestion, which at all events shows that, if not an architect, he had an eye for architectural possibilities.

The next chapter takes us through Touraine with many illustrations either in the form of engravings or facsimile reproductions from the author's rapid sketches on the spot. These are very free and spirited in execution, the hasty sketches; they do not give an idea of Petit's powers as an artist, which were best exhibited in water-colour. The succeeding chapter deals with Poitiers, Vienne, Charente, Gironde and the Pyrenees. Charente has since then been magnificently illustrated in the beautiful volume got up by the Architectural Association as a memorial of their excursion into that district under the genial guidance of Edmund Sharpe. There is a chapter on "the barrel-roofed churches of central and Southern France," on "Romanesque work," on Normandy and the Seine, and on "Modern Style," not in regard to France especially, but in regard to the whole problem of the modern use of ancient styles. The architect of to-day will find that Petit's views on this subject were remarkably advanced for the date at which he wrote. He points out that the revivers of the Classical style in the Renaissance period never thought of confusing their work with that of the ancients, or of producing structures that might be mistaken for specimens of old Roman art. "They took what they wanted from the magazines of antiquity, moulded it into new combinations, and enriched it with new additions, as to make it a real living style, suited to the exigencies of the day." This is perhaps a little too much to say for Palladio, but does apply to a good many of the Italian architects of the Renaissance. He wishes to look upon an Angevine church in the same light also, namely "as being capable of an aspect now suggesting the imitation of another age or people; as admitting of great refinement of decoration, as combining dignity, solemnity, and convenience, and as manifesting sound construction and durability." This is a suggestion capable of almost unlimited application. The whole chapter is well worth reading as a criticism on the position and the opportunities of modern architecture.

As a whole, the book affords a most agreeable and readable summary of the subject not without interest to the architectural student of to-day, though written by an amateur of the last generation. Its chief value however is as a book for general readers who wish to have something more than a guide-book notion of the Early Mediæval architecture of France, by an observer who, without going into technicalities which would only be of interest to professional architects, and while writing from the point of view of an amateur, possessed sufficient special knowledge to be an intelligent and reliable guide. The book is one which should find a place in the libraries of all who are interested in architecture.

Royal Institution.—The lecture arrangements after Easter include the following:—Dr. E. E. Klein, three lectures on "Bacteria: their Nature and Functions" (the Tyndall Lectures); Professor Sylvanus P. Thompson, four lectures on "The Dynamo"; Mr. H. Graham Harris, three lectures on "The Artificial Production of Cold"; and Professor A. H. Church, three lectures on "The Scientific Study of Decorative Colour." The Friday evening meetings will be resumed on April 10, when a discourse will be given by Sir William Thomson, on "Electric and Magnetic Screening."

NOTES.

THE rumour as to the intention of some of the railway companies to emphasize their protests against the Board of Trade proposals by withdrawing some of their new Bills, was confirmed by the Chairman of the London and North Western at a special meeting of that Company on the 20th inst. Lord Stalbridge remarked that, looking at the effect of the Board of Trade schedules upon the revenue of the Company, the directors had considered it necessary to withdraw from their two principal Bills capital powers of £1,200,000*l.* and 600,000*l.* respectively, together with borrowing powers amounting to a further 600,000*l.*, and several minor Bills relating to widenings and extensions. We notice that the *Economist* considers this course ill-advised, but it has probably been taken with a view of influencing the decisions of the Joint Committee who are about to consider the Board of Trade proposals; and it remains to be seen whether the abandoned projects will not again make their appearance in another session. It is doubtless considered that a capital opportunity is afforded for a stronger and more practical protest than the mere prophecy of a diminution of income, and that the committee will be impressed with the idea that a great falling-off in profits is seriously anticipated. There is certainly a very wide difference between the proposals of the Board and those of the Companies; but, as there is an equally wide difference between the latter and their actual charges, there is not much fear that railway property is about to be depreciated, or that it is unsafe to embark any more capital in it.

IN the course of a recent answer in the House of Commons, with reference to the repairs of bridges by County Councils and the parochial authorities, Mr. Ritchie seemed to suggest that he had some legislation in regard to roads in view. We hope that such legislation is imminent. There should be one clear and complete Highway Act dealing with all matters connected with highways. Such an Act should also put the question of the widening of highways on a clearer footing. At present there is great disinclination by highway authorities to widen roads. This frequently prevents many places from progressing as they should do, and lowers the value of property. Wide roads are main elements in the comfort and convenience of localities, and in the long run cost less than narrow roads, which continually require to be repaired. What is needed is that a certain number of ratepayers should have the power to request the highway authority to widen a road, or part of a road, at the expense of the parish, and from the decision of the highway authority there should be an appeal to the County Council.

IN December last we gave a short sketch of the history of the so-called Berlin Cathedral question, and since then we have referred to the exhibition of models and drawings of the latest design for the cathedral worked out under the superintendence of Professor J. C. Raschdorff. That there is an increasing spirit of opposition to this design is obvious from the proceedings of the Parliamentary committee debating on the general Budget. In the financial year of 1889-1890 a vote of some 30,000*l.* had been granted for preparatory works for the proposed cathedral, and of this sum some 24,000*l.* still remain. It has now been proposed by the Government to extend this vote for the purpose of erecting a provisionary place of worship in place of the one to be pulled down (*i.e.*, the old "Dom") to make room for the proposed Cathedral; but this idea has been unanimously voted against, the committee not considering it advisable to vote money indirectly towards an object they are now opposed to, and do not believe can be carried out for the roughly-estimated sum of half-a-million sterling. The project now on exhibition (*i.e.*, the latest one) is estimated to cost about one and a half millions sterling, and even if the amount of sculpture shown in the design be reduced, or (as proposed) the whole cathedral, as is now proposed, be materially reduced in size, it is by no means certain that even then the sum of a half-a-million will be sufficient for the purpose. For the present, therefore, there seems to be a block in the cathedral question.

A RECENT number of the 'Εστία (22) announces that we are to have yet another School of Archæology founded at Athens. Spain is about to found an institute, which in general constitution will be after the model of the German one, hence we suppose it will be supported by Government. So far the Spaniards have done little for the promotion of the study of classical archæology,—no doubt owing to the lack of antiquities in the country. Madrid has long possessed a collection, including both marbles and vases of interest, but it is long since any substantial additions have been made. The Spanish school will make the sixth archæological institute founded at Athens, not counting the organisations of the Greeks themselves. It certainly seems a pity that some foreign nation should not select Asia Minor as its field, and Smyrna as its head-quarters. This was suggested at the time of the foundation of the British School. The members of a school settled at Smyrna would certainly have to forego many social delights, but they would be doing excellent missionary work in pushing out the outposts of archæology. Athens is really getting overcrowded with specialists, and already there is almost unseemly contention as to who should be first to pounce upon, elucidate, and still more publish each new discovery.

OATLANDS LODGE, Oatlands Park, is offered for sale by the late Sir William Drake's executors. In the finely-timbered grounds stands the famous grotto made at a cost of 40,000*l.* by Henry, ninth Earl of Lincoln, who by a special remainder in his favour, succeeded to the Dukedom of Newcastle-under-Lyme, at the death, in 1768, of his Countess's uncle, Thomas Holles. His son sold Oatlands to the Duke of York, who increased the estate by about 1,000 acres, including Brooklands and Byfleet. The house, —supposed to have been built by Henry, seventh Earl of Lincoln (died 1728),—was burnt in 1794, and rebuilt in an incongruous mixture of the Gothic and Castellated styles after designs attributed commonly to Holland. But in his "History of Surrey," Vol. II., 1841, E. W. Brayley says he owned several pencil sketches of it drawn by John Carter, whereon Carter describes the mansion as "erected under my own direction after the various styles of our ancient architecture." Lately converted and enlarged for purposes of an hotel, Oatlands is an historic property. By an indenture, dated Jan. 27, 1538, Henry VIII. takes it in exchange from the Rede family for the site and demesne lands of Tandridge Priory in the same county. As a royal palace it was visited by Queen Elizabeth, who used to shoot with a crossbow in the preserves, and was occupied by Anne of Denmark, for whom Inigo Jones built a park-gate, towards Walton-on-Thames, and, it is said, the "silk-worm" room. The estate was made over for her life to Queen Henrietta Maria, and there her son, Henry of Oatlands, the Duke of Gloucester, was born. In Brayley's book is a woodcut, reproduced from Manning and Bray's "Surrey," giving a bird's-eye view of the Palace, with its many courts, *temp.* Elizabeth. Much of this was destroyed, and the grounds were disparked, during the Commonwealth. On his mother's death, Charles II. gave a lease to Henry Jermyn, Earl of St. Albans, whom she is supposed to have married. A subsequent grant to Sir Edward Herbert, Lord Chief Justice of the King's Bench, was transferred to his elder brother, Arthur, who demised the property (1716) to Henry, seventh Earl of Lincoln, as some say, having been meanwhile elevated, in 1689, as Earl of Torrington. In St. Mary's Church, Walton, were set up monuments to Lilly, the astrologer, who died at Hersham, in 1681*; Richard, Viscount Shannon (1740), by Roubiliac; and to his early patron, Mrs. Sarah D'Oyly, by Chantrey.

AT Berlin the "Akademie für Bauwesen," *i.e.*, an Academy interested in building matters, both pertaining to architecture and civil engineering, assembled in full force on the 16th inst. to consider what steps should be taken by them in regard to the school-education reforms, planned by the Emperor, to insure that youths, aspiring to the practice of architecture and engineering, should enter the Technical Colleges better prepared for the work in store for them than they are at present. The meeting appears to have been the scene of decided differences of opinion in regard to the matter of preliminary education, and, after a warm discussion, the majority were in favour of the more general educational programme, including classics, and against the students of the Colleges being recruited from the "modern" schools. The results of the meeting are to be embodied in a report, and to be published in the official *Centralblatt der Bauverwaltung*.

IN reference to the subject of Bridge Chapels, of which some illustrations were given in the *Builder* of November 22 and 29, 1890, it may here be mentioned, as supplementary to the information then given, that at Salisbury there is a chapel, now incorporated as a dwelling-house and divided into three stories, on the central pier of Harnham Bridge on the south side of the city. The pier being built on an islet of the Nadder there is more room for the chapel than is commonly the case with bridge chapels. The bridge was built by Bishop Bingham in 1244, and the chapel, which is dedicated to St. John the Baptist, is of this date. The east end still shows a triplet of lancets, and there are four more or less perfect on the north and south walls. Modern ceilings and partitions have destroyed nearly all appearance of antiquity within; almost the only relic is an Early English piscina in a fair state of preservation. At Lincoln also there was a chapel dedicated to St. Thomas of Canterbury on the "High Bridge" across the Witham. The earliest mention of it is in the reign of John, by whom the patronage was given to a Lincoln merchant before 1272. Elias, "the Parson" gave land in the High-street, adjacent to the bridge, for its maintenance. In 1304 the mayor and corporation founded a chantry in it. But so little care was taken of it by them that in 1324 Bishop Burghersh found it necessary to issue an injunction to the municipality to repair it. This seems to have been satisfactorily done, for a chantry founded at the neighbouring church of St. Benedict's by Thomas of Wigford and Agnes his wife in 1330 was transferred to this chapel. The foundation of another chantry was contemplated by George Heneage, then Archdeacon, and subsequently Dean of Lincoln in 1543, he giving 100*l.* and furnishing it with plate. But the times changed. Chantries, instead of being founded, were everywhere dissolved, and Heneage was glad to get his plate and 40*l.* of his money back again. The chapel was speedily desecrated, and in 1549 the bell was taken down and sold, and the corporation ordered that the sacred building should be converted into a dwelling-house. Early in Elizabeth's reign the chapel was granted to the Company of Tanners and Butchers as their common hall. It lingered on in ever-increasing desecration and decay until it was finally taken down about 1762. From a drawing taken by Buck, now, we believe, in the Bodleian Library, showing its eastern end, it appears to have been a building of much dignity, with a lofty gable containing a wheel window of six divisions, and a row of lancet windows below. It was strengthened by tall graduated buttresses at the corners.

* "Hoc illi possuit Amoris Monumentum Elias Ashmole Armiger."

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE tenth ordinary general meeting of this Institute for the present session took place on Monday last, at 9, Conduit-street, Mr. Alfred Waterhouse, R.A. (President), in the chair.

Examinations.

Mr. W. H. White (Secretary) announced that a Preliminary Examination to qualify for Probationers was held on March 3 and 4. There were 60 candidates admitted; 13 were exempted; 37 were examined in London, of whom 23 passed; 13 were examined in Manchester, of whom 6 passed; and 18 were relegated. An Intermediate Examination was also held on the same dates, when there were 13 Probationers admitted. Of these 11 passed, and 2 were relegated to their studies for a period.

An Examination in Architecture was further held during the month, when 63 candidates appeared, of whom 60 were admitted. Of these, 24 passed, 30 had been relegated to their studies for a period, and 6 had not passed. The following are the names of the passed candidates in the last named Examination, which qualifies for candidature as Associate of the Institute:—

Begg, J., Edinburgh	Kitsell, T. R., Weston-super-Mare
Capper, S. H., Edinburgh	Knight, J. A. G., London
Clark, A. H., London	Little, J. W., Clare, Suffolk
Cressall, W. T., London	
Dods, R. S., Brisbane	Mallet, H. E., Exeter
Eves, W. L., Uxbridge	Mayston, A. R., Norwich
Fairhurst, H. S., Blackburn	Muscher, A. J., London
	Moore, A. H., Cricklewood
Fleming, O., London	
Fraser, W., London	Prentice, A. N., London
Griggs, H. J., London	Rawlinson, J., London
Hanson, E. C., London	Sim, E. H., London
Howgate, W. C., Ealing	Twist, J. W., South Shields
Hutchings, J., London	

The President added that they must be allowed to congratulate those who had the care of these examinations, and themselves, as Members of the Institute, on the satisfactory result of the examinations.

Some Aspects of Sculpture in Relation to Architecture.

Mr. George Simonds then read a paper on the above-named subject. The following is an abstract of the paper:—

The author considered that the subject demanded a general consideration of the arts as at present existing; of their past history and modern practice; and of the relation in which they stood to one another. A satisfactory definition of art was not easy, but it was not far wrong to say that art was embodied poetry and poetry disembodied art; their end was the same,—namely, the elevation of humanity and the idealisation of the present life and of every-day surroundings. Art under her present limited circumstances could do but little, and her influence for good was sadly restricted. Yet the time had been when art was loved and fostered for truer and better reasons than now,—not by the few alone, but by entire nations. While strongly maintaining the unity of art, its usual division into three branches had its advantages, although he greatly deprecated the tendency at the present time to ignore their close relationship. Painting was probably the oldest art, but that and sculpture had been merely pastimes for the gratification of a vague desire for beautiful form and colour, while architecture was the outcome of man's physical needs; and it must have been long before the last mentioned emerged from the purely utilitarian and took rank as a fine art. Without agriculture, architecture in its fullest sense could not have existed. In a primitive agricultural community architecture should flourish in an exact ratio to wealth, but in a trading community, choked [with the commercial atmosphere of modern times, he could hardly see how there could be room for better art than prevailed at present. It was only when architecture ceased to count the cost, and was enabled to expend more than mere construction required, that she could take her true position, and enlist colour and form into her service; and what then was the relation in which the arts stood when thus combined? Architecture was the employer, and must be mistress of the situation. She needed nothing that her own resources could not give her, save ornament,—applied ornament. Sculpture in relation to architecture was to be considered as applied ornament, as a general rule; in the case of monuments, sculpture was the dominant idea, and architecture had merely to provide a worthy setting. The laws of ornament were largely founded on principles of judicious self-restraint. The most important was that the ornament should not interfere with the true functions of the object ornamented, nor conceal its purpose; it should not be disproportionate in value to the object, and no part of a building should be left unadorned that fairly admitted of decoration. Every blank space should not be utilised, but no space should be left blank unless there were a gain in so leaving it,—which was often the case. It would be hard to lay down a rule as to which parts of a building should be ornamented and which left plain, yet it might be assumed that carving was usually admissible where there was ample light, and where the situation afforded some degree of protection from injury, as in pediments and spandrels; and these positions should be occupied by choice work, not by mere masons' carvings. In wide spaces of blank wall, where sunk panels were used, sculpture might be turned to excellent account. Shafts of columns were not usually a good field for sculptural decoration, and very elaborate bases and capitals were seldom quite satisfactory. Caryatides used as independent supports seemed even more objectionable, although used as applied ornament the effect might be extremely fine. The proper amount of relief to be given to work in any position, and the amount of realism admissible, were points of first importance and of great difficulty. The relief in the powerful group of "Hercules and the Horses" in the pediment of the Royal Mews, Buckingham Palace-road, was exactly suited to the position, which was not the case in the pediment of the public baths a few hundred yards away, in which the post of honour intended for St. George was usurped by the belly of his horse. Much had been written and said to prove that marble sculpture was out of place on a stone building, but the effect of time on stone and marble formed a harmonious whole out of what seemed at first mere incongruous patchwork; and the effect of time deserved consideration. Liverpool afforded examples of that in the marble statues on the Town Hall, and the bas-reliefs of the St. George's Hall. Mr. Simonds referred in considerable detail to various kinds of marble for sculptural purposes, and described their good qualities and defects, mentioning the quarries from which they were procured. Although common sense condemned the practice, sculptured floors were not unknown, notably the flooring of the Palace at Koyunjik, built by Sardanapalus III. about 700 B.C., and known to most from the Assyrian collection at the British Museum. It was a pity so lovely a design should ever have been trodden under foot: and he considered a floor to be one position where no sculpture should ever be. The ceiling, on the other hand, offered a clear field for sculpture. and he was glad to notice that within the last few years considerable attention had been given to it. The first object of a ceiling was to cover the room, secondly to diffuse and reflect the light, and it should be kept clearly defined and be light in colour. There could be no worse decoration for a ceiling than pictures. From what information the author had gathered of Indian sculptural decoration it seemed to be so far removed from that of the West that it could scarcely be hoped to deduce from it much that would be of service in England. From the representations of the ruins in Yucatan, sculptural decoration in Central America seemed to have been treated in a manner which could not but be appreciated and approved. The temples appeared to have been placed on the summits of vast pyramids; they were rectangular in plan; and the front wall was pierced with five doorways, having wide and massive piers between each. These piers were each adorned with a colossal figure in relief, the effect being almost Classic in its grandeur and simplicity, while the sculptural decoration had been applied with great skill and judgment. Having referred to the Egyptian and Assyrian sculptures, the author considered the only building in England which showed affinity to the Egyptian and Assyrian temples as a historical record was Westminster Abbey, and he strongly deprecated any removal of its sculptured monuments. Much of the sculpture in England in connexion with architecture was Gothic, and he could not understand why it was always so grotesque and unnatural. The old English sculptor carved his charmingly quaint kings and saints in simple faith, making them as good and natural as his art would permit; now they were carved as the sculptor knew they never were, and the result was a self-conscious caricature of the naïve, unconscious work of the older artist. The modern work gave the author no pleasure, although he greatly admired some of the genuine old statues, but though a series of figures all round an arch was out of place. In almost every school and age instances could be found of misapplied sculpture, excepting, perhaps, the Moorish. The bronze horses half way up the façade of St. Mark's, Venice, was an example, while one of the finest examples of how to treat sculpture in connexion with architecture at Venice was in the Campo SS. Giovanni e Paolo,—namely, the statue of Bartolomeo Coleone. The Florentine artists of the Renaissance were not often to be found in fault, unless it were that occasionally the leading part seemed to be assumed by sculpture when architecture might be expected to be predominant. Having described several examples of Florentine work, Mr. Simonds referred to the Romans, who had, he considered, used sculpture with more restraint and more consideration for architecture than either the Venetians or the Florentines; perhaps architecture and sculpture harmoniously working together was best exhibited in the Church of Sta. Maria del Popolo, in the Sforza and Basso Tombs, both by Sansovino. Although the finger of scorn had been pointed at the Albert Memorial, it was, in his opinion, a work of which the nation might fairly be proud. It was a first attempt, and a most creditable one to realise the proper relationship between the three branches of art. There were many maxims beginning with "don't" to be observed, such as "Don't turn a hero's monument into a temple of Cloacine"; "Don't leave your triumphal arches and gateways unadorned with sculpture"; and, if there happened to be an arch crowned with an indifferent statue, don't take it down unless to replace it by something better. Alluding to Hyde Park Corner, the author drew attention to the want of relationship between the architecture and the sculpture, and considered, referring to the copy of part of the Panathenaic frieze on the gateway to Hyde Park, there was no greater sign of poverty in a nation's art than to put up with copies from elsewhere. He could well imagine with what admirable effect sculptural decoration might be used in domestic architecture, but the cost of the first outlay, the restlessness of the age, and the system of building on lease-hold land, rendered it unlikely for sculpture to take a serious part in adorning domestic architecture. Four things were needed: a freehold for the site, a liberal employer—liberal of mind as well as of hand—a cultivated architect, and, last, a sympathetic sculptor. Whenever and wherever these came together, there could be no difficulty in solving the problem of the true relations of sculpture and architecture.

Mr. H. H. Statham, at the close of the paper, proposed a vote of thanks to Mr. Simonds, and offered a few remarks which the paper had suggested. In the first place, as to the general principle touched upon at the outset, that there was only one art, and that they were bound always to consider that, it was, of course, entirely true in one sense, viz., that the artistic spirit was equally to be displayed in painting, sculpture, or architecture. There was great gain in certain directions from their being used in association with each other. But there was another point, which was a little forgotten in the present day, viz., that painting and sculpture, when they were to be used in connexion with architecture, had both to give up something, and he had often been surprised that sculptors did not seem to see that. And he wished to urge also that architecture was not after all dependent, even for her higher effects, upon a combination of sculpture and painting. In the case of the Pantheon, that grand conception of the great dome with the large eye in the centre,—any one who went there did not think of the sculpture and painting, but of the architectural conception. Of course architecture was not merely the appearance of the building, but the conception based on the plan. He fully agreed with Mr. Simonds that another glory was added in the case of sculpture, but, at the same time, he wished to maintain that architecture could stand alone. Turning to the consideration of sculpture, in

nust be remembered that when it was desired o make sculpture part of the architectural whole, it was necessary to treat it with a ertain reserve. The sculpture, for instance, in he front of Wells Cathedral harmonised dmirably with the whole, but was more or less onventional, the only part where there was ny vitality being in the half-life-sized figures f the Resurrection series. If the whole f the sculpture on the front had been treated n the same way, the repose of the architecture ould have been destroyed. There was a sigificant anecdote told about Thorwaldsen, when e was asked to make a set of statues of the postles for niches. He said he would have no culpture in niches, but, being pressed to conent to it, he asked for the exact height of the iches, and then took care to make all the tatues just 2 in. too high to go in. That owed how strong his idea was that his culpture should stand alone. Of course, culpture was assisted very much by having n architectural background. At the same me, if a piece of sculpture was strong vitality and expression, it should and alone by itself, and not as a part of building. One question had not been uched upon, viz., that of the subjects of the ulpture which was to decorate modern buildgs. Were they to go in for Classical subjects, attempt what the Greeks did, and represent eir own life? That was a question which had ot yet been fairly answered, but if an attempt ere made to represent everyday life on the ildings of the present day, it would obably, in many cases, cause as much nusement as it did enjoyment. He beved that the French had solved the oblem of monumental sculpture well, and might instance the beautiful monument to egnault, where there was no attempt to go to the difficulties of portraying the man himlf, but to erect an architectural design, with bust portrait forming part of it, thus giving e intellectual presentation of the man, and aking it a part of the architectural design, here were one or two separate points he would ke to refer to. With regard to very richly namented capitals, he thought the objection as only when the ornament was in too high lief, and one felt that in a smoky town it uld not last, but he did not think that richss of ornament was any objection in itself, long as it was kept in low relief. There was great beauty about low relief work, and it was urious question why the Greeks put high relief topes on the upper portion of their buildings, d, at the same time, put a very low relief eze at nearly the same height in the me building. He should be inclined to think at the Parthenon frieze should have been wn below, and near the eye. With regard to George's Hall, and the combination of rble and stone there, he considered the roduction of the marble rather an unhappy ing, and quite contrary to the intention of e architect, who had left a set of projecting ne blocks which were eventually to be rved in sculpture. He believed the architural result would have been better if the ulpture had been carved in stone, instead of ting in marble, which took away the architural unity of the building. He was glad to ar what had been said about the decora-n of ceilings with pictures. It was the rst thing that could be done with a cture to put it on the ceiling. As to estminster Abbey, surely they were not to be ked to accept that as a parallel with Greek d Egyptian sculptures which were in the same yle as, and in harmony with, the buildings th which they were associated. He fully reed, at the same time, with Mr. Simonds in s opinion, that he would not allow the numents to be touched, but not for any tistic reason; in fact, if it were simply an tistic question, he would bundle most of em out of the building. He objected to their ing touched because when people put up the numents they had a right to expect that ey should not be tampered with. He would press his hearty sympathy with the remarks r. Simonds had made about the modern ock-Mediæval sculpture, which was only ne because it was a fashion of the day. ith regard to the Wellington Statue, Mr. monds apparently thought that the new atue should have gone on to the top of the gh. Now, there he most strongly dissented om the lecturer for this reason, that the architural design of the arch required a finial ing to the front of the arch, whereas the equestrian statue could only be placed sideways on it. The *quadriga* intended by Burton formed a sculptural group, fronting the same way as the arch. A *quadriga* had not very much meaning for us now, perhaps, but as a matter of composition it was much more suited to the position. He begged, again, to move a vote of thanks to Mr. Simonds for his paper.

Professor Kerr seconded the vote of thanks.

The President, in putting the vote of thanks, said that Mr. Statham had so thoroughly traversed the paper that there was very little more to say on the subject. He would only call attention to the fact that Mr. Simonds thought the architect was the employer and master of the situation, and that seemed to go into the whole question of the employment of sculpture on architecture. It was, perhaps, the reverse. Architects felt that sculptors had a reputation as artists, and that any attempt to dictate to them would be out of place. The consequence was that sculptors were left, when employed on architectural work, very much to their own devices. However excellent their works might be, there was, therefore, a want of sympathy between them and the architecture which surrounded them. The consequence was that the alliance was felt to have been more or less a failure. He believed that Mr. Simonds had struck the true chord. He had impressed upon them the importance of an absolute sympathy between the architect and sculptor. The architect must, of course, come first, and must design the building, before the sculptor entered on the field of his labours, and all that was required was a more thorough accord and sympathy between the two artists. With regard to Mr. Statham's remarks about the metopes of the Parthenon, it had always seemed to him that those metopes were made in high relief, because they were placed immediately under a projecting cornice, which threw a very strong shadow.

The vote of thanks was then put and carried by acclamation.

Mr. Simonds, in reply, said that the differences between himself and Mr. Statham were probably more apparent than real. With regard to his remarks about sculpture having to suffer when placed in immediate connexion with architecture, he could not see that there was an evidence of that in the sculpture of the friezes from the Mausoleum at Halicarnassus. He could not imagine anything freer or more truly sculpturesque than these with regard to the metopes; his objection was not to works in high relief, but to the employment of a high relief when the works were placed high and had to be seen from below. He agreed with what the President had said as to the effect of the projecting shadow being thrown over them. Much of the sculpture in Westminster Abbey was abnormal and hideous. At the same time, it was a grand historical record, and it was impossible to detach sentiment from Art.

Mosaics.

Mr. Arthur T. Bolton next read a paper on "Mosaics." Mr. Bolton said he had written his short notes to be read in connexion with some drawings exhibited on the screen. It appeared that writers divided mosaics into four classes, such as (1) *Opus Tesselatum*, in which the cubes were $\frac{3}{4}$ in. to $1\frac{1}{4}$ in. square, the designs being geometrical; (2) *Opus Sectile*, composed of cut portions of marble or glass enamels fitted closely in elaborate designs; (3) *Opus Fictile*, or mosaic in cubes of glass; and, lastly, *Opus Vermiculatum*, in which pictures or imitations of natural objects were copied by very small cubes, the joints forming no part of the design. This last class was also divided into two, *Opus major* and *minor*, the former being executed in a coarser style. It was to the class of *Opus Tesselatum* that the drawings mainly belonged. Such work was also termed "*Lithostratum*," the word "*musivum*," from which "mosaic" was derived, being originally reserved for the elaborate works classed above as *Opus Vermiculatum*, and also for works in enamel and glass mosaic. The origin of these pavements had been ascribed to stucco floors painted in patterns, but this did not appear to be a very scientific deduction. Perhaps they originated in simple *pisé* floors of brick or marble fragments, afterwards lined out by cubes of white marble into simple patterns, and some floors of this rudimentary kind might be seen at Pompeii. The rather tame effect of the white on the pink-red would be followed by the use of reds and yellows in coloured patterns, and the progress of the art would lead to the imitation of pictures, which was carried to so great an extent in later work; but this class was beyond the province of pavements. Mosaic was, of course, executed in any hard materials, durability and colour being the chief things attended to. The examples on the screen were nearly all in white and black marbles. Belgian for black, and Carrara for white, would be used for modern work, as in an example shown of a chancel pavement at Folkestone. As to the execution of the examples, the first thing that would be noticed was the variety in the sizes of the cubes used, and in their spacing. The examples of patterns for the Baths of Caracalla might be compared with that from the House of the Poet at Pompeii, which was the smallest style of work in the set. The Caracalla cubes were as much as an inch square. The centre ornament in the pattern for the House of the Poet was an extremely old form, and might be seen on an Assyrian bronze dish in the British Museum, it being formed by intersecting circles. The mosaic of the Wild Boar was, of course, well-known, and it was curious to compare it with a Romano-British example, where the white ribs were omitted as their importance and value were made evident. With regard to the Venetian examples, the scroll in a larger key than the Pompeian was interesting, especially for the characteristic use of some red to heighten the effect. Two classes of common errors to avoid in executing mosaic pavements might be mentioned. First, filling, or the use of smaller pieces than the cubes employed for the general design—in patches, say, to fill up a curve—was very bad. It was like the use of a half-tone, and tended to make the pattern unduly detach itself from the ground, which was a great defect. Secondly, fitting, or the cutting of cubes to circles—as for eyes—or to wedge shapes for curves, &c., was very injudicious; it tended to destroy the conventional and free character of the work. Modern mosaics were apt to fail by such points being overlooked, and he was glad when a publisher undertook to produce his drawings as a book, reducing them only one-half their size, and giving, in addition, three plates of selected pieces full size, showing, for the first time, in a handy form, the true methods of old mosaic pavements.

Professor Kerr proposed a vote of thanks to the lecturer, and in so doing, desired to make a few remarks on the general question, for to his mind the subjects of the two papers were practically one. If there was one thing more than another in which he thought English architects had, for many generations past, been deficient it was in the use of applied ornament. They had that evening had an explanation of the principles of almost all kinds of ornament which the architect had to use. There was the ornament in flat, such as was appropriate for the mosaics; the ornament which was termed ornament in mere relief; of which Mr. Simonds spoke; the ornament called carving, and which might be said to be different in some particulars from what was termed mere ornament in relief; while, lastly, there was the use of sculpture, which had been so singularly neglected in this country. The use of sculpture, as an ancillary art to architecture, was what Mr. Simonds, to a great extent, suggested with some enthusiasm. The President had made a very proper remark to the effect that an architect scarcely liked to dictate to a sculptor of equal or greater eminence than himself; and it seemed to him that was a point of very great importance. A little time ago, a discussion took place in the French Chamber of Deputies with regard to art questions in relation to a certain monument. The architect, so far as he understood, was considered to be master of the situation, and it was found that the sculptor and painter rebelled, and there was very great difficulty in the architect keeping them in harness. If, then, the French, with their peculiar qualifications, could not get a sculptor and painter to run in harness, how much more difficulty would the English architect, with his peculiarities, find in getting these men to act in a subsidiary capacity to himself? A good many years ago a discussion took place in that room on that particular question, when the late Mr. John Bell, a very distinguished sculptor, was present. He (the speaker) ventured then to mention that a sculptor of considerable eminence in Edinburgh had told him that a life-sized figure, of a similar character to those which adorned Sir James Pennethorne's build-

ing in Burlington-gardens, for the University of London, could be produced for 100*l.*, and he asked Mr. Bell if he would give a little information of a practical kind with reference to that statement. Mr. Bell's answer, however, was that when he was asked to produce such and such a statue for Westminster Hall, he got 1,000 guineas for it. But that information was of no use to architects, and that was all they could get. It seemed to him, therefore, that the English sculptor, if he was to get the advantage of working on buildings, must put himself on a level with the ordinary French and Scottish sculptor as represented by the one he had mentioned. The sculptor must consent to do his work—he would not say "on the cheap," and still less would he say in an inferior manner,—but in such a way as to come within the limits of the resources of Englishmen. Sculpture of a high order had been too expensive. They could get carving done at a moderate expense, but there was no reason in the world why they, like the French and Germans, should not be able to overlay their buildings with sculpture,—he did not say of the highest class, but of a style equal to that with which they were familiar in the French and German work,—at such an expense as Englishmen would consent to pay. In connexion with that, he would like to remark upon the doctrine which had been hinted at that evening of the unity of art,—a doctrine which was coming very much to the front, and which would serve, in the course of the next generation or two, not only to consolidate the arts at large in their influence on the English mind, but to encourage artists to regard all arts as of equal value, and having for their object the improvement of the public mind, not simply for the gratification of the *dilettanti*, but for the enjoyment of the world at large. That he considered to be the view which the public of this country were beginning to take of art at large, and that was what was meant by the unity of art. The old formula of the three arts—the sacred trio of Painting, Sculpture, and Architecture, had gone by. There were many other arts besides these three, and he ventured to claim an equal value for them because of their equal merit as agents for the enjoyment of the people at large. The Albert Memorial had been referred to as an illustration in point, and an excellent instance, no doubt, it was. The sculpture which was produced there was of a very high order, and of a much higher order than architects could expect to make use of in connexion with ordinary buildings. He was extremely sorry to hear the criticism of Mr. Simonds on the statuary produced in this country. The remarks made by Mr. Simonds on the point he considered quite undeserved. No doubt much of our sculpture was bad—there was a certain average, beneath which all was to be more or less animadverted upon, and above which all was to be commended; but it was a pity that a sculptor should join in the idle cry of newspaper penny-a-liners in condemning all sculpture indiscriminately. A great deal of modern sculpture was of exceedingly high merit, and much which had been produced in the present day in the form of public statues was well worthy of the highest aspirations of English sculptors.

Mr. J. M. Brydon seconded the vote of thanks to Mr. Bolton, and was sorry that his paper had been so short. The principal difficulty of architects in connexion with public buildings was that they did not get the opportunity of employing sculpture, because they had not the money. He hoped the day, however, was not far distant when a better state of things would prevail, and notably in the case of the proposed new building at South Kensington, which, he hoped, would be a representation of the union of the arts in painting, sculpture, and architecture.

The motion was then put, and very heartily received.

Mr. Simonds said he wished to remark that he must have very badly expressed himself if he was supposed to have fallen foul of the British sculptors. What he had fallen foul of was their employers. The fault did not lay with the architects and the sculptors: the fault lay with the employers. Although he said it himself he considered the sculptors of England were a wonderful body of men, and there was no other country so situated as this, where they had a school of sculpture such as we had in England. There were a number of men who practically kept British sculpture going at their own expense, while in all other countries the art was subsidised by the Governments. In England, on the contrary, it was kept alive solely by the self-denial of a small band of enthusiasts; and it was not from any lack of goodwill or talent that sculptors had not done better. With regard to the question that Professor Kerr had asked as to the price of a statue, it was like asking what would be the price of a life-sized portrait by an English portrait painter. The price would vary according to circumstances, and the cost of the statue would depend on whether it was done by a carver under the guidance of the sculptor, or whether he did it all himself. He had no doubt that many men in London would make a small-sized model, from which a full life-sized statue would be pointed, for 100*l.*, but such a man would not make a life-sized model and execute the statue himself for so small a sum. On the other hand, they would get a much better statue for 500*l.* or 600*l.*, although the public would not be able to tell the difference.

The President then announced that at the next meeting of the Institute, on April 6th, Mr. William Simpson would read a paper on the "Mutation in Indian and Eastern Architecture."

The proceedings then terminated.

SPANISH ARCHITECTURE.*

SPAIN is a country fascinating chiefly through its unlikeness to any of the other parts of Europe. It is with a sensation almost approaching awe that one passes through bleak treeless plains unbroken by any homesteads, except at long intervals the glint of a few white low walls amid the prevailing brown, and perhaps, rising above the horizon, the toothed and dinted edge of one of the Sierras, justly so named.

Though there are other scenes than these, the emerald vineyards, with gorgeous pomegranates between, the fertile fields of the Vega, and the wooded valleys in the north, the foreigner will, nevertheless, carry away as his impression of Spain that of a treeless, rocky expanse, not without a certain grandeur of its own, but in spite of the brilliant sunlight, presenting a somewhat cheerless front to the wayfarer. Not so the cities, for, as with other southern races, the vivacity and *bonhomie* of the people give their town life a cheerfulness and interest, the novelty of which is very grateful to the Englishman.

Consequently, though in France or Italy one may like to stray from the beaten track in search of the simpler but frequently more picturesque architecture to be found amid rural surroundings, you will find in Spain less inducement to do so,—the vast area of the country, and the distance apart of the principal towns, rendering the difficulties greater.

While far from suggesting that there are not many places in Spain that have not been adequately studied, I should say that the best course for the student would be to proceed from town to town,—except, perhaps, in Andalusia, where, time permitting, a ramble up one of the mountain valleys would prove an attractive excursion.

However, as far as work is concerned, almost entirely in the cities does one find that vigorous architectural effort which in France and England is also visible in country mansions and churches. The rural work is chiefly confined to defensive castles with but few pretensions beyond their utilitarian purpose. Architecture in Spain may be broadly divided into four groups, namely, the Roman, the Gothic, the Moorish, and the Renaissance. The remains of the first-named are both extensive and widely distributed, but as might be expected do not compete with those of Italy in variety and elegance of detail.

As regards the Gothic work, my studies were not of a sufficiently comprehensive character to enable me to add anything to Street's standard work on the subject. The Gothic work, with some notable exceptions, lies mostly towards the northern part of the peninsula, being contemporary with the Moorish work in the south.

Having thus briefly dismissed these two groups, I come to the third, comprising that work which is usually termed Moorish; it should, however, be subdivided under three heads. The first subdivision, which I should term Arabic, was, of course, greatly under the influence of the Byzantine style (the one prevailing in the civilised world when the Arabs first came in contact with it). This Arabic style lasted from the seventh till the eleventh century. The second subdivision is the true Moorish style, and its development dates from the ascendency of the Moors. The third is usually termed Mudejar, and comprises the performances of the Moorish workmen under the direction of the Spaniards after the Christian re-conquest. Though the terms are not full expressive, I shall refer to these three developments as Arab, Moorish, and Mudejar respectively. The principal monument of the first is the great mosque at Cordoba, from which though it has suffered considerably by subsequent alterations, a great deal of information may be gleaned. In the earliest portion the date of which is 786 to 796 will be found but little, if any, original ornament, the capitals of the columns being all Roman, taken, most probably, from the neighbouring Italica. The second portion (date 961-67) includes the magnificent Mirhab with its mosaic and carving evidently both in colour and form under the influence of the Byzantine style, and said to have been partly executed by workmen from the East (I might note that most of the mosaic work is an unworthy restoration). The third portion of the mosque was added by Al Manssour in 988-1001, and to it belongs the doorway shown in one of the sketches on the screen.

You will see that the work still retains some of its Oriental character, and differs entirely from the Moresque of the Alhambra and Alcazar. I may mention, in passing, that apart from the loss of its elaborate ceiling more recent restorations have inflicted the most serious injuries on the building from an artistic point of view. The much-abused choir of the sixteenth century is, to my mind, by no means an unmixed evil. The mosque, with its repetition of form, has a somewhat monotonous character and almost the only play of light and shade it possesses is due to this lofty lantern rudely thrust into the midst of its avenues.

The work of the Arab period will be found to be far from possessing the marvellous facility of *technique* which was afterwards attained, the fatal facility, in that it led to the repetition of form which renders the Moorish work somewhat unpleasing to the European mind.

Passing on to the next sub-division, best typified in buildings of the Alhambra and the Alcazar, one might note that in the former building but little remains of the original coloring of the plaster work; in the latter none at all. Considering the elaborate way in which this work has been described and illustrated, I will only venture the remark that in the various drawings and restorations I have seen the colours appear to me to have been kept too much too bright a key, the blue particularly being too light. I believe the general tone to have been much fuller and deeper, such as that of an Oriental carpet or a Byzantine mosaic,—the schemes in both of which I imagine to have been developed from some common origin in the early Aryan races of Western Asia.

As regards the Mudejar work, though not without interest, it will not by most of us be considered worthy of extended study. To this style may be said to belong the numerous artezonado ceilings, of which the one I have here is an example.

I should think that the work in Sicily, executed under like conditions, possesses many points in common with it.

This Mudejar style was practised in the southern part of Spain, down to the time of the final expulsion of the Moors in the sixteenth century, and though some work of a Gothic character was executed, it was too late in its transplantation to reach any thoroughly organic form. In many cases pointed design is incongruously combined with Moresque details from which it had not completely freed itself before being swept away by the Renaissance.

In Granada, of course, hardly any work that can strictly be called Gothic exists. The date of its capture, 1492, being but a few years prior to the general introduction of the Renaissance.

Nevertheless, you will, I think, come to the conclusion that the Spaniards, a Gothic race, were imbued with a true feeling for the style that by rights belonged to them. In witness of this, note their affectionate retention of the Gothic mode of architectural expression far on into the sixteenth century; in some cases, as at Segovia, almost completely Gothic; in others, as at Granada and Baeza, retaining

* From a paper by Mr. H. V. Lanchester, read before the Architectural Association on the 20th inst., as elsewhere mentioned.

ne plan and general proportion, while using lassic detail. Though this was not carried to ne extent general in France, the Spaniards eem to have been far from displaying the eadiness of the Italians to revert to the ncient forms.

We thus find that the Spanish Renaissance as developed under two strong influences, that f the Moresque, chiefly evident in Toledo and ne South, though with some admixture of the ational Gothic feeling; while in the north the tter influence (as might be imagined) pre-ominates.

The characteristics which the Spanish enaissance drew from the Moorish work are nose that give it its individuality; remove nem, and it could (I believe) hardly have laid aim to being considered as more than a anch of the French, at all events a style much llied to it.

The Moorish influence consequently remains ne most interesting study in tracing the de-elopment of the work of the Spaniard. To is it owes in great measure the minuteness nd delicacy of finish which has earned for it ne misnomer of "plateresque," to this again he richness and intricacy of detail full of play-l and exquisite fancy. And, again, that aluable effect obtained by the contrast f features of great and piquant interest, ith large, simple, sunlit wall surfaces ut not all was gain. The Moor, who never red of covering his erections with exquisite tterns, had quite different ideas on the nctions of ornament to the European, and as consequently but a poor guide as regards ructural expression or scale. One finds in large proportion of the sixteenth century ork a want of skill in dealing with ornament at, despite the, and sometimes indeed because f the minuteness of parts, leaves an impression of arseness in the whole, an impression one rarely ceives from Italian or French work of this date.

I feel confident that you would find the study this earlier Spanish Renaissance a most teresting one, as apart from its intrinsic value. think I shall be able to show you that it had small share in the formation of the English enaissance style of the sixteenth and seven-enth centuries. Curiously enough, while the rt that France and the Netherlands played forming this style of ours is admitted, the fluence coming through Spain seems to have en in great measure overlooked. Without sregarding the fact that much of this influence obably reached us by way of the Netherlands, ring the Spanish ascendancy there, I yet think at a large proportion of it was direct.

Turning to history, we find under the later udor sovereigns ample instance of intercom-unication between Spain and England; in ct, Spain took at that time by far the most ominent part in our external politics—some-mes in peace, as during the two royal arriages and contemplated third, at others war, but the whole time, in all probability, rrying on an active interchange of ideas, ther by means of commerce or political issions, or at times by the prisoners of war.

What, during this time, were the external ducements toward intercourse with Italy? hey were but slight. In individual cases, such, r instance, as Burleigh, direct influence from ne fountain head must be admitted; but I ould consider that, prior to Inigo Jones, few f the English builders derived their inspiration om Italy. France, from her proximity, must ave had a share in forming the English Re-aissance; but I believe that in the work, bviously suggested from abroad, the Spanish haracter will be the one most frequently pre-ominant.

Let us appeal to a few examples. Now, the arliest which I can call to mind is in the Per-endicular period, and is exactly where, if any-here, one would have expected to find it, amely, in the town that was formerly the reat port of the west—Bristol. You will know at I refer to the doorway in the north orch of St. Mary Redcliffe (there is a door-ay of similar outline to the Church of Iron cton, but it is probably a mere imitation of ne other). With this exception the doorway is nique, and quite unlike anything else in the ountry. Its curious reversed curves, which annot be called cusps, are anything but struc-ural forms in themselves, and could only have een derived from the interlaced tracery ommon in Spain and some parts of Germany. ts character and treatment speaks, if my emory serves me, distinctly in favour of the ormer source.

Passing on to the Renaissance, I will point out by the aid of these photos and sketches the points where there appears to be a parallelism in the arrangement of detail between the Spanish and English work. Take the general grouping. Both often favoured an elaborated and raised centre feature contrasted with simple, broadly-treated wings, as at Bramshill. At Kirby is a not very successful effort at a centre feature of the type I mean.

There you will find pierced parapets as at Layer Marney, and finials at intervals treated in a remarkably similar manner. Then, as to doorways: I have noted those of Wroxton Abbey, Oxford; Montacute; Waterstone, Dorset, which you would find it interesting to compare. The later one at St. Mary's, Oxford, is perhaps the most striking instance I have come across; one would hardly have been surprised had one found it in a Spanish town.

I would draw your attention to the ceiling of Boughton Malherbe, as illustrated in Nash. I might multiply instances of numerous other features, as staircases, &c., but there is little need to do so.

Mr. H. O. Cresswell said he had very much pleasure in proposing a vote of thanks to Mr. Lanchester for his interesting and suggestive paper. He (the speaker) regretted that he had not himself been in Spain, and, therefore, he should not like to pronounce upon the theory which Mr. Lanchester had broached, that the English Renaissance architecture was derived to some extent from Spanish architecture. Mr. Gotch's new work on the English Renaissance was very opportunely now in course of publication, and although the first part of it only dealt with the earlier phases of the Renaissance, he thought it would be suggestive to take some of the plates which had already appeared, and which would appear, and compare them with the illustrations which they had before them of Spanish architecture.

Mr. S. B. Beale said he had very great pleasure in seconding the motion. He, also, regretted that he had not been to Spain; but Mr. Lanchester's paper, with the many beautiful illustrations which accompanied it, almost made him feel as though he had been there. One peculiarity about Spain was, that in whatever direction their taste might lie in architecture, it contained a great deal which they could all admire. That was a *trait* which hardly belonged to other countries; and he therefore hoped that the Committee of the Association would endeavour to arrange for an excursion to Spain, which, it appeared to him, offered a very great field for sketching. Whatever their individual tastes might be, they would all be able to find something for their pencils. He should have liked to hear from Mr. Lanchester a little more about the decoration of interior wall surfaces. Was there much of that to be found? He thought that Mr. Lanchester had in a very interesting manner endeavoured to draw some parallels between English and Spanish architecture; but, nevertheless, he did not think he was right in his deductions.

Mr. Garbutt, in supporting the motion, said he thought Mr. Lanchester's paper was a very interesting one, and he thought that there was something in the suggestions that he had made as to the derivation of some features of English Renaissance architecture from a Spanish source. There was one peculiar feature about Elizabethan work, viz., the long pinnacles which were to be found stuck up in Elizabethan buildings. They did not seem to have been derived from the Gothic; but they were very similar indeed to features of the same kind which were shown in the drawings of Spanish detail exhibited by Mr. Lanchester.

The President, in putting the motion, said that there could not be two opinions as to the interesting paper which had been read to them by Mr. Lanchester. Mr. Lanchester was also additionally entitled to their thanks, inasmuch as he had at the last moment stepped into the breach caused by the inability of Mr. Prior to read the paper which was arranged for in the syllabus of meetings. As he (the President) had not been to Spain, and had not seen the detail which Mr. Lanchester conceived might have given the idea for some features in English Renaissance detail, he would not venture to pronounce upon the tenability of Mr. Lanchester's theory.

The motion was then carried.

Mr. Lanchester, in the course of his reply, said that with regard to internal decoration there was very little of it to be seen in most Spanish buildings, as it had been covered up by coats of glaring whitewash. In architectural sculpture, however, the Spaniards had done some very clever work. Much of it was still to be seen.

Mr. Horace Townsend then read a paper on "The House that Jonathan Builds," which we hope to give next week.

UNIVERSITY COLLEGE LECTURES.

On Thursday, the 5th inst., Mr. Cecil H. Smith (who, along with Mr. St. Chad Boscawen, takes part with Professor Poole in the present course on Archæology) gave the first of his four lectures on Greek Vases and Pottery in the first Greek room of the British Museum. He said that while the Greeks used pottery for ordinary purposes, they placed vases in their temples and tombs. The painters of pottery were never reckoned as great artists—only craftsmen. The Greeks separated art from handicraft, and raised it to the highest level. The earliest forms of vases are to be found in Hissarlik in the North and Cyprus in the South. These present few, if any, traces of metal; no bronze knives were used, only spikes of flint; no wheel was employed, and the clay was coarse and friable, while the shapes were crude, cylindrical, no foot or handle appearing on any of them, except where in a very few a pinch was made in the side, so that that piece being pierced and a string having been put through it, served as a handle. One of the latest of these early vases has three legs. The decoration was rude and scratchy. They were shaped like gourds, or shells, or basket-work. The next stage shows us finer clay, so that the polish is greater, while the last stage of the Hissarlik pottery has decorations of geometrical lines. In the island of Thera were found specimens of early decorated vases, forming the link between this early pottery and that of Mycenæ. Schliemann, of course, has made this site famous by his discoveries, and the classes are easily identified: (1) those vases which are very rough in shape and decoration; (2) those produced by the wheel, and with the peculiarity of Greek pottery, a glazing paint employed. The vases found at Ialysos (mentioned by Homer), and Rhodes may have been produced at one centre; but one main influence was the sea, leading us to believe that there was a great naval power existing then—the octopus, sea-weed, sea-birds, and fishes being represented; (3) those showing a great advance, the glaze of the painting being of a high order. One question naturally arises (Mr. Smith said), which is, how far were these people of the Grecian Islands original in their work; or are the traces found by Mr. Flinders Petrie at Fyûm indicative of an Egyptian source? At first the vases in Mycenæ were of angular form, and gradually they were decorated with horses and birds. One of the latest geometrically-ornamented vases comes from Athens, and is the earliest one *inscribed*, dating from the beginning of the seventh century B.C. In Cyprus the geometric style never died out, Cyprus never having been completely Greek, and it has continued to our own time. At a further stage of the development of pottery the effect of Oriental cylinders and tapestry is seen. The cylinder was rolled over the wet clay all round the vase, giving the Greek artist the idea of the frieze system. There were two main directions from which this importation came, from Egypt by sea, and Asia Minor direct. The Ionian pottery presents a fresh style, although here we have the cylinder and the tapestry effects. If we look at the figures in the Assyrian galleries (said the lecturer) we shall see exactly the same ornaments on the robes as here—friezes of animals. The ground-work is filled in as much as possible with geometric designs, as we see in Turkish carpets. In some vases we see the elongated forms of goats and other animals, and the introduction of new Eastern ideas, the sphynx and the griffin, as well as a tendency to select the top frieze for the introduction of special animals. Mr. Smith also pointed out the introduction of the "rosette" and incised lines for details in the face, &c. He lastly drew attention to a very fine specimen of a plate from Camirus in Rhodes, in which we have the earliest example of a combat scene, the fight between Hector and Menelaus over the body of Euphorbus; and this shows a variation from the Homeric story, as if indicating a still earlier stage of the legend. Here we have incised lines, suggesting metal-work.

Mr. Smith gave the second of his lectures on Thursday, the 12th inst., in the British Museum. He said that as the sites of the Ionian colonies were excavated we should find more of the same kind of fragments of sarcophagi, &c., decorated with friezes of animals, and with a background of rosettes and tapestry figures. At Daphnæ in Egypt we find a strong Asiatic element (from 595-560) forming a transition from the Ionian style to the immediate precursor of the black figured system. Here we have such representations as that on one vase, the winged god Boreas, exactly corresponding to a description given by Pausanias. There was a great deal of influence from Corinth in the earlier work. Next to the pottery at Daphnæ was that of Chalcis. The principal seaport of Corinth was in the western bay, and from thence it pushed its trade; and very much during that age is due to Corinthian influence. Mr. Smith then spoke of the Italian local school, and said we could see there the Greek style of combat-scene, and an Oriental or un-Greek characteristic of making the decoration out of proportion to the vase. It is chiefly *hydriæ* which are found here. On one of these there is represented a Græco-Egyptian myth—Heracles and Busiris, an Egyptian king, in conflict. On another vase we have more combat-scenes, corresponding exactly with such as we find on early tombs in Etruria; and while in some pottery we have dancing figures exhibiting Greek art, several of the dresses suggest local Italian influence. An interesting vase, here pointed out, is one with a frieze of birds and a combat between Heracles and some foe, while a goddess stands near him clothed in a goat-skin, and with the *horns over her head*. The ægis was originally a goat's skin, and this would indicate Athene herself; the nearest parallel type is the Latian Juno Sospiter. Mr. Smith then referred to what is known as the "Archiselaos cup," and spoke of its gorgeous colouring, presenting a somewhat bizarre effect on the light ground. King Archiselaos is represented as watching the weighing of the silphion before it is stored away. Much of this style was borrowed from Egypt, as may be seen from the papyrus Books of the Dead; but Corinthian ideas are quite visible. The best instance of Cyrenian vases is one in which the central female figure is that of the nymph Cyrene herself holding the apple-bough, while there is a scene showing winged figures (the sons of Boreas) approaching to attack the harpies. Mr. Smith said that some tall, slender amphoræ he pointed out, show what Athenian pottery was at this period (the early part of the sixth century), the shoulders being reserved for human mythical figures. The fabric from Chalcis is only identifiable by inscriptions (marked by an alphabet peculiar to Chalcis), and is strongly under the influence of metallic forms. The hunt of the Calydonian boar in some of these vases occupies the whole field. About 560 B.C. we have a definite Athenian style, and from this point Athens was almost the sole producer of these vases. One representation is the birth of Athene from the brain of Jupiter fully armed—Vulcan springing away amazed. Another is that of Perseus fleeing after cutting off the head of the Gorgon—a favourite topic of Athenian vase painters. A third shows a procession of the gods to the marriage of Peleus. Mr. Smith then spoke of Panathenaic pottery, made only at Athens, and prepared solely as prizes for the Panathenaic games. On one side of a vase there is—sometimes Athene herself, on the other a chariot race. The history of the black painting on a red ground is the struggle between the black varnish and the red clay. The black clay was used for handles and feet and a small portion of the body. In the next stage the black glaze comes down and meets the black glaze below. Before the panel system was introduced, the artist had a difficulty in filling up the whole field, and, in order to give him a square place, he placed a column on each side. Another plan borrowed from Egypt was to use the sacred eye of Osiris to fill up the blank spaces. This style lasted for about a century after this. Some artists placed boughs of trees in the background. Dionysos is often seen on this pottery, with vine branches in his hand and spread all over the vase.

On Thursday, the 19th instant, Mr. Smith delivered the third lecture of the course. He said that all through the sixth century and the greater part of the fifth, the great object was to decorate the vase as fully as possible with whatever kind of painting would suit its form. This was the beginning of the decline—the mere striving after pictorial effect. A large number of figures were introduced, as we have a wedding procession on the François vase. The vases used thus are generally amphoræ, as the handle coming down on each side naturally forms a panel on the reverse and obverse. The hydriæ suggest a similar treatment, and the black-figured style lasts longest in these shapes. The kylixes, being peculiar in form, suggest an exterior and interior decoration. They were hung on the wall, and the frieze went round the lip. But when the vases were standing on their feet, the great difficulty was to deal with the inside. One, therefore, presents two figures of Silenus placed head to feet. In cups many artists have declined to attempt more than to decorate with the old band or frieze of animals. In some we have combat scenes, and also spectators. The "eye" spoken of in last lecture was also used to fill up the space. Several have only a band and a sentence addressed to the owner, such as "treat me well." The difficulties referred to led the artists to use another device, and thus in the kylixes we meet the new style of red figures. Mr. Smith then pointed out several specimens of the *alabastron*, evidently copied from certain vases of alabaster containing unguents imported from the East. These were decorated with Libyan subjects, and generally bore the signature of the artist,—not his name, but his birthplace; one, for example, calls himself Nicosthenes (two vases signed by him are in the Louvre). These are all distinctly under Egyptian influence. We find quite a peculiar treatment of a circular space. Outside there is, *e.g.*, a hunt, and inside a frieze of animals, a system inspired by Phœnician bowls. One vase bears a representation of a central figure—Hermes—looking on at two combatants; he has scales in his hands, and little objects are to be seen in the scales, evidently meant for the souls of the combatants,—manifestly an idea of Egyptian origin. Mr. Smith then referred to one vase with brilliant blue-black glaze, where the figures are not left in the natural colour of the clay, but painted. One vase has the interior white, painted on red. The commencement of the red-figured style, once thought to be about 480 B.C., is now known to have been 520 B.C. at least; the evidence is from the excavations at the Acropolis, and from the style of their decoration. Some vases are in the red-figured style on one side, and the red and black on the other. The artist took the vase as it came from the pottery, and first used an ivory tool on the moist clay; we can see the sketch marks still, and alterations made on them. One peculiarity is that whatever he draws, he draws throughout, for we can trace the form of the arm anatomically correct underneath a shield figured over it. He then took a fine brush with a little colour, and went over his corrected outline, while an inferior workman filled in the black ground. The vase was next partly baked, and the details worked in with black paint. Another peculiarity of the red-figured style was the treatment of the eye. In the other style it was marked only, engraved, and was like a bird's eye, while here it was painted in, so that, however the looker-on moved, he got the same effect. Pliny says that Cimon of Cleone "invented" this treatment. The kylixes were probably the first of the red-figured style. The hair, of course, in this work must be black, and the old device of graving lines was resorted to; but some artists left the head in outline, and gave a realistic idea of the hair by painting it a fine brown. Immediately after Sophocles Theseus constantly appears, having become the favourite hero of the Athenians. Mr. Smith then spoke of the influence of the great painters (such as Polygnotus) on pottery decoration, painting being at this time under the influence of sculpture, and pointed to several vases with rich colouring on a white ground, as well as gilding. This period is marked by the introduction of fresh colouring.

The next lecture will have reference to the polychrome effect, showing the later art of vase-painting to be but a weak imitation of the higher art.

UNIVERSITY EXTENSION SOCIETY, EPSOM BRANCH.—A meeting of the members of this Society took place on the 20th inst., when Mr. Hatchard Smith, A.R.I.B.A., read a paper on "Domestic Architecture," describing the best specimens of existing buildings from the thirteenth century. The subject was illustrated by a large number of drawings.

THE ARCHITECTURAL ASSOCIATION.

A SPECIAL general meeting of this Associa-tion was held on Friday, the 20th inst., at 9 Conduit-street, for the purpose of approving o the new Constitution and By-laws as amended b counsel.* Mr. Leonard Stokes, President, wa in the chair.

Mr. E. S. Gale (Hon. Secretary) read th minutes of the three special meetings held t consider the subject. These minutes were con firmed.

The Chairman said that in *A.A. Notes* fo March would be found printed the Constitutio and By-laws as verbally amended by counse Since, however, they had been in print, counsel had again seen them, and had suggested a fe further amendments. These were as follow:-

At the end of Article I. of the Constitution, the words were to be added: "or any statutory modifica tion thereof at the time being in force."

At the end of Article VII. of the Constitution, erase the words "to By-law XIII.," and insert the wo "thereto."

At the end of Article XIV. of the Constitution, add the words "or any statutory modification there for the time being in force."

In By-law XVIII. for "roll of members" rea "register of members."

In By-law XXVII. delete the word "And" at th beginning of the last sentence, and then let th sentence read "All cheques on the account of th Association shall be signed," &c.

At the end of By-law XXIX, for "ensuing session read "current session."

In By-law XXXV, transpose the word "so" at th end of the last sentence but two, and let it read thu "each member so nominated being nominated by," &

In the first line of By-law XXXVI, delete the wo "sole."

In By-law XLVI, for "affiliated society" read "allie society."

At the end of By-law XLIX, add the words "or a statutory modification thereof for the time being i force."

The Chairman said it was therefore now h duty to propose that the new Constitution an By-laws as amended by counsel should be fo mally adopted by the Association.

This was agreed to unanimously, and th special general meeting terminated.

The ordinary fortnightly general meeting wa then held.

Mr. E. S. Gale (Hon. Secretary) read th minutes of the previous meeting, which wer confirmed.

The Chairman announced that Mr. Gotch ha kindly presented to the Association the firs part of his valuable work on "The Renaissanc in England." A vote of thanks was accorde to the donor by acclamation.

Mr. E. S. Gale said he wished to propose a cordial vote of thanks to Mr. Wolfe Barry, th engineer of the Tower Bridge, for permittin the members of the Association to visit th works of that structure on the 14th inst., an to Mr. Crutwell, the resident engineer, f having so kindly conducted them over th works. This was agreed to by acclamation.

Mr. Gale next announced that the visits fo April would be as follows:—On Saturday, th 11th, to Mr. Brooks's church, in Holland-roa Kensington, and on April 25, to the new Weig House Chapel, Duke-street, Grosvenor-squar when Mr. Waterhouse, the architect, ha kindly promised to meet them and take then over the building.†

The Chairman next announced that, in con sequence of certain difficulties which ha arisen, it had been found necessary to post pone the members' *soirée* from April 10 t May 8.

Mr. H. V. Lanchester then read a paper o "Spanish Architecture," the substance of which with some notes of the discussion which fol lowed, we give on another page.

Mr. Horace Townsend next read a pape entitled "The House that Jonathan Builds." This paper, together with some notes of th discussion, we hope to give next week.

The meeting then terminated.

The second "Students' dinner" was held a the Piccadilly Restaurant on the 14th inst when fifty-two guests assembled. The President of the Association, Mr. Leonard Stokes, who occupied the chair, invited the co-operation o all members in the work of the reorganisation of the Association, and stated that the Com mittee were most anxious to hear both individua

* The text of the new Constitution and By-laws before being submitted to the revision of counsel, will be found in our reports of the various meetings held to consider the subject. (See the *Builder* for December 20 and 27 1890, pp. 481 and 496, and January 24, 1891, p. 67.)

† We may mention that we gave a double-page view of this building in the *Builder* for January 18, 1890.



Gifford's Hall, Suffolk: A "Restoration" Sketch.

and collective expressions of opinion in this matter. Three toasts only were proposed, the last being "The Students' Committee and their Chairman, Mr. Earle," proposed by Mr. S. B. Beale, and supported by Mr. C. H. Brodie. In replying, Mr. Earle explained that the hope of the Students' Committee was "to introduce some social element into the life of Architectural Association students, and to discover, organise, and utilise the talent and enthusiasm of juniors, for the benefit of the Association and all its members."

GIFFORD'S HALL.

Gifford's Hall, near Stoke-by-Nayland, on the borders of Suffolk, was a residence of the Manack family from the days of King Stephen. On the family leaving the residence about 1826, and letting the place to a tenant, they built a new chapel (the old one having been destroyed by the Puritans) on the border of the park, and endowed it with a part of the park land as a glebe. The hall was besieged, and the roofs and most of the chimney-stacks damaged or destroyed, and rebuilt in the most economic form; the original gable pulled down, and the roofs reconstructed from the wreckage, supplemented by unwrought timber cut on the estate. This property came to the hammer in November of last year, and was purchased by the present owner.

The Hall surrounds a quadrangle, on plan an irregular-sided oblong, the north and much of the east side being timbered construction, probably no later than Edward III. About the middle of the east wing is the great banqueting-hall. Brick walls and mullioned windows of the Perpendicular period, and a large round-headed sash-window of the Georgian era. The roof is oak, open-timbered, massive, and rich in carving of bold treatment; and there is a wide arched fireplace and fine external chimney-stack, carrying two fine moulded brick shafts high above the roof. This has suffered little from accidental injury. This chimney has a square-headed Perpendicular window of two lights, inserted high over the fireplace, and deeply-recessed without, splayed deeply down on the inside; a minstrels' gallery runs across the south end of this hall, where also at the south-west corner is the main entrance, with a fine exterior porch in brick, much disfigured by plaster and colour-wash. A carved beam at level of the floor, of contiguous portions of this wing, indicates it may have been half-timbered work above. It is finished with an Elizabethan gable, a casement window of uncertain date, with a Renaissance carved sill, gives light along the minstrels' gallery, which has doors communicating with landing of the grand staircase, and other apartments, whilst a door on the floor of the hall opposite the main entrance gives access to the grand staircase, which is of three broad flights of stairs. The original Perpendicular woodwork has been altered, or otherwise replaced by clumsy, late Jacobin or Georgian balusters and handrails, &c. The timbers of the ceiling have the moulded lofts cut off flat, and the spaces between are plastered to give a greased classic appearance. The large kitchen and offices are in a wing at the back of this, with bed-rooms above walls of brick, and many sash-windows added. Similarly with the south wing, forming the chief residential part of the premises, modernised to the end of the Georgian era, only a good plaster ceiling of the last century's date claiming notice. On the west side is the entrance gateway, with semi-octagonal flanking towers in red brick of the Perpendicular period, it may be early Tudor, it is in two stories, only the towers forming window-bays to the rooms within. The ornamental patterns in brick resemble that at Falkturn Hall, and the residential parts of S. Osyth's priory in Essex.

The timbered portions of the house are of especial architectural interest, the wood being much of chestnut of extra large scantlings, and in place of brick nogging much of the filling-in between timbers, particularly in the inside partitions, is, and was, done in clay mixed with straw and fine twigs, and seasoned as hard as terra-cotta. All doorways had four-centred arch heads in timber, cut from the solid, likewise boldly-projecting corbelled exterior sills to windows; all main beams showing inside are boldly moulded and richly carved, with an artistic freedom more resembling transition decorated work than usual Perpendicular; the north side is apparently the exterior work The contiguous part at the north-east angle has fine carving externally, on horizontal timbers. The building is now stripped of the lath and plaster sham front, done during the "classic craze" in architecture; when the fine corbelled sills were chopped off and all projecting carved woodwork, and nondescript windows inserted in some parts. Fortunately sufficient traces were left to see what the details formerly were, as shown on the drawing accompanying these notes.

In this connexion it may be useful to note observations of the writer in examining full fifty separate cases of repairs to old-timbered houses in this neighbourhood during the past few years. In every instance "dry rot" had taken the timber work after having been covered up by plaster, whilst the exposed parts often are quite sound, or little decayed, although weatherworn, as were the other timbers at time of being plastered over, all weather marks defining grain of the wood and cracks, &c., appeared intact; but the wood crumbled to the touch,—in some parts it had become almost shapeless masses of dust. Unfortunately, such is the condition of much of the timber-work at Gifford's Hall, the inside partitions, which have been plastered over, suffering as much or more than the timbers of outside walls from dry-rot, whereas the beams and moulded ceiling joists in rooms that have not been covered up from the air are well-preserved, even the chips and splintering from the "Vandal's axe" show as fresh as if recently done.

A pen-and-ink drawing of the north-eas

angle of the court-yard is given, showing what the buildings probably were like up to time of the siege by the Parliamentary forces. Every evidence exists for the reconstruction of gables and minor parts, and, judging from the ornamentation to existing exterior timbers, verge boards, &c., were enriched in design originally; but nothing is anticipated in the sketch which is carried out in generalities, only as regards obliterated details. The rational reason for gables with gutters between roofs, transversely to the faces of the building, is to carry rain water outside, whereas roofs longitudinally carried half to the "water shed," to be deposited in the quadrangle, which, in this case, had to be drained out under the buildings, next the roof spaces may afford room for attics; extra height and apparent dignity, with a pleasing sky line of building. The timber construction throughout is admirable carpentry, put together by wood trenails and pins, not a spike bolt or strap, mortices and tenons in every required degree or variety, such as "Thomas Tredgold" delighted to describe, much of these details have come to light through "recasting" of interior of the building, the wood sound, and joints as true as when first done. The plain or straight parts could be used in rebuilding, and if only the joinings cut off as waste could be preserved to technical schools as examples to carpenters and joiners, it would be a valuable means to meet a pressing need of this time, especially as the Government has voted a munificent sum towards improving technical education in this country. B.

THE LONDON WATER QUESTION.

IN accordance with the resolution of the London County Council, printed in our last issue (see p. 230, *ante*), Sir John Lubbock, the Chairman of the Council, gave notice in the House of Commons on Friday, the 20th inst., of his intention to bring in a Bill to confer powers upon the Council with respect to the supply of water, the intention being that, when brought in, the Bill shall be referred, together with the five or six other Bills on the question which are now before the House of Commons, to the Select Committee to whom the London Water Commission Bill was to be referred.

As to the constitution of this Committee, we may here mention that in the House of Commons on the 18th inst, it was resolved, on the motion of Mr. Ritchie, the President of the Local Government Board, that Mr. T. H. Bolton, Sir Algernon Borthwick, Mr. Bristowe, Mr. Lawson, and Mr. Murdoch be members of the Committee, four more members to be added by the Committee of Selection. On the following evening Mr. Ritchie moved

"That it be an instruction to the Committee on the London Water Commission Bill that they have power to inquire into all matters connected with the nature, price, management, sources, and sufficiency of the water supply of London and its suburbs, and to insert in the Bills such provisions in connexion therewith as in their judgment are expedient."

In the discussion which followed, Mr. Causton suggested that it should be a further instruction to the Committee that they should inquire first into the subject of the Metropolis Water Charges Bill, which had already been referred to it. There was a likelihood, he pointed out, of an increase in the charges in respect of water in consequence of the quinquennial revaluation coming into operation on April 6. If the revaluation should be permitted to come into operation there would be a fresh charge of 40,000*l.* annually on the ratepayers of London. The matter was therefore very urgent.

Mr. Ritchie, in reply to this, said that it was perfectly true that the House had read the Bill to which the hon. gentleman had referred a second time, but it was well understood that it did so not to commit itself to the measure, but in order that the Bill might be sent to the Committee. The hon. gentleman said that unless what he proposed was done, the revaluation would come into operation on April 6. In that case, no action which the Committee could take would prevent the revaluation from coming into operation, because the Committee could not possibly report in time to prevent it. The Bills were of enormous importance, and must be left to the Committee to decide upon. Therefore he could not assent to the suggestion.

Sir John Lubbock asked whether, under the instruction as framed, the Committee would be able to inquire into the efficiency, condition, and value of the works, and, if not, whether he would introduce words to that effect? As regarded the suggestion of the hon. member for Southwark (Mr. Causton), he hoped the Committee would see their way to consider the point at an early stage of their proceedings.

After Mr. Ritchie had replied, to the effect that he thought that the terms of the "instruction" comprehended everything necessary to be inquired into, the motion was agreed to.

This is the position in which the question, regarded as a whole, now stands before Parliament. We are obliged to hold over our promised *résumé* of the Special Report of the Parliamentary Committee of the London County Council on the subject until next week.

THE FRANKFORT ELECTRICAL EXHIBITION.

As stated in a recent issue, a great electrical exhibition is to be held at Frankfort-on-the-Main, between May 15 and September 15 next.

Germany holds at present, in the field of applied electricity, such a prominent position that an attempt will be made to make this exhibition demonstrative of that position, to which must be added a desire for triumph over the Paris Electrical Exhibition of 1881, which was attended with such success.

The site for the exhibition will be close to the new central railway station. There are at present in course of erection a number of buildings of which the principal will be the great machinery hall, in which will be mounted every kind of dynamo, which will also furnish the motive force for sundry purposes in the exhibition. In another part of the grounds a long thoroughfare of workshops will be constructed, in which will be shown the numerous manufacturing and industrial purposes to which electricity is now applied. The necessary motive power for this will be furnished partly by the dynamos referred to and partly by waterfalls in the Taunus mountains, in order to demonstrate the manner in which electricity may be generated by the same, and the current carried to distant parts for utilisation. From this part of the exhibition an electric railway runs down to the River Main to the exhibits in the latter, viz., a lighthouse lighted by electricity and craft propelled by the same force.

A building is to be specially set apart for the illustration of the purposes to which electricity may be applied in every-day life. Here will be found telegraph and telephone apparatus and electric lighting apparatus, &c., of every kind, and the installation of the latter will show their most favourable application for the lighting of shops, large public rooms, theatres, &c.

Moreover, in a separate section, will be shown the enlistment of the light in the services of art and science.

COMPETITIONS.

THE BATTERSEA POLYTECHNIC.—The Committee of the South London Polytechnic Institutes, have, after a most carefully conducted competition, by an almost unanimous vote selected Mr. Edward W. Mountford as the architect for the Polytechnic Institute, which it is intended to erect at Battersea on a site of 2½ acres facing the Battersea Park-road. We illustrate this design in our present issue. It is stated that the six sets of plans submitted were all of very high merit, and the Goldsmiths' Company have very kindly promised to lend their hall at an early date in April for their exhibition. The 13th of April, we believe, is the date fixed.

PROJECTED NEW CHURCH, HAM HILL, BIRLING.—We learn from a Kentish paper that the Ham Hill Church Building Committee has selected the designs of Mr. H. Percy Monckton, of London, and nominated him as their architect for the erection of Christ Church, Ham Hill, Birling, near Snodland.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION: ELECTION OF AN ORPHAN.—A special general meeting of the donors and subscribers of this Institution was held on Tuesday last at the office of the Institution, 21, New Bridge-street, E.C., for the election of a child for presentation to the Orphan Working School, Haverstock-hill. The President, Mr. Benjamin Hannen, junr., who occupied the chair, stated that Cyril Ludford, being the only candidate, would be proposed for election by show of hands. Some particulars of the case having been given, Mr. E. C. Roe proposed, and Mr. C. K. Turpin seconded, that the child be elected, which was put and carried unanimously. Mr. A. A. Stanger returned thanks on behalf of the little one, who was present with his mother. There will shortly be another vacancy for a builders' clerk's orphan. The meeting closed with a vote of thanks to Mr. Hannen for presiding on the occasion.

Illustrations.

FOUNTAIN OF CHARLES V., AND TOWER OF SAN PEDRO, SEVILLE.

THESE two illustrations are reproduced from two of the drawings made by Mr. H. V. Lanchester during his tour as Owen Jones Student of the Institute of Architects. They are printed in a light warm tint in order to preserve, as far as may be in monochrome, something of the warm and sunny effect conveyed by the colouring of the original drawings.

The fountain is one of the Classic additions made in the neighbourhood of the Alhambra in the time of Charles V., probably at the same time when the large ugly palace was built which cuts diagonally across the outskirts of the Alhambra courts, opposite to and practically stopping up the original Moorish entrance to the court of the Alberca. The fountain is just outside the enclosure of the Alhambra grounds, the roadway up to the "Gate of Justice," seen in the background, being on the other side of the wall which forms the continuation of the Fountain erection.

The Tower of San Pedro at Seville is very much on the model of a common form of Italian campanile, with an enriched story above a plain stalk, and an octagonal lantern above that. The proportions of the tower, however, differ from the usual Italian type in the fact that the stalk is not so lofty in proportion to the superstructure as is usual in Italy; and its effect is further somewhat weakened by the introduction of the window openings and balconies, which rather detract from that stern solidity of expression which is characteristic of the Italian campanile of this type.

SOUTH LONDON POLYTECHNICS:

THE BATTERSEA INSTITUTE.

THIS design (selected after a double competition) has been prepared in accordance with instructions framed by the Committee, who had the advice and assistance of Mr. Rowland Plumbe, F.R.I.B.A.

The building is to be erected upon a site of over two acres, fronting the Battersea Park-road, and having other roads upon the remaining three sides. The cost is estimated at 40,000*l.*, exclusive of fittings.

In preparing the plans, it has been endeavoured to obtain perfect straightness and simplicity of the corridors, together with such arrangement of the various departments that though all are kept perfectly distinct and separate, they are brought into direct communication with the principal entrance and each other. The lighting of the various rooms and corridors has also been very carefully considered.

The concentration of each department was another point to be arranged. The Technical Class-rooms all adjoin each other on the first floor, as do the Art Class-rooms on the floor above, all the latter having large north lights. The Music-rooms occupy the whole of a floor of one projecting wing, the Laboratories doing the same in another. The various rooms of each social department (for men and women respectively) adjoin each other, the refreshment rooms for each being in direct communication with the kitchen.

The great hall is arranged so that it may be let for any purpose without in any way interfering with the use of the Institute, and numerous exits are provided on all sides.

The following accommodation is provided:—

Administrative department	4,180	sq. ft. in area
Technical education (including art rooms)	24,600	,, ,,
Physical	7,500	,, ,,
Social recreation	5,300	,, ,,

In addition, the great hall provides accommodation for 1,200 persons and a large organ, with every convenience for a chorus and orchestra.

It is proposed to use red bricks for the wall-facings, with terra-cotta dressings, and brown Broseley tiles for roofs. The floors of corridors and all staircases are to be fireproof. The building will be heated on the low-pressure steam principle, and lighted by electricity.

WELL-HEADS, ITALIAN RENAISSANCE.

BRONZE cisterns or well heads are not common in Venice, marble being the usual material. The two finest in bronze, one erected in 1556 by



FOUNTAIN OF CHARLES V., ALHAMBRA, GRANADA.—From a drawing by Mr. H. V. Lanchester, A.R.I.B.A.



SELECTED DESIGN FOR BATTERSEA POLYT

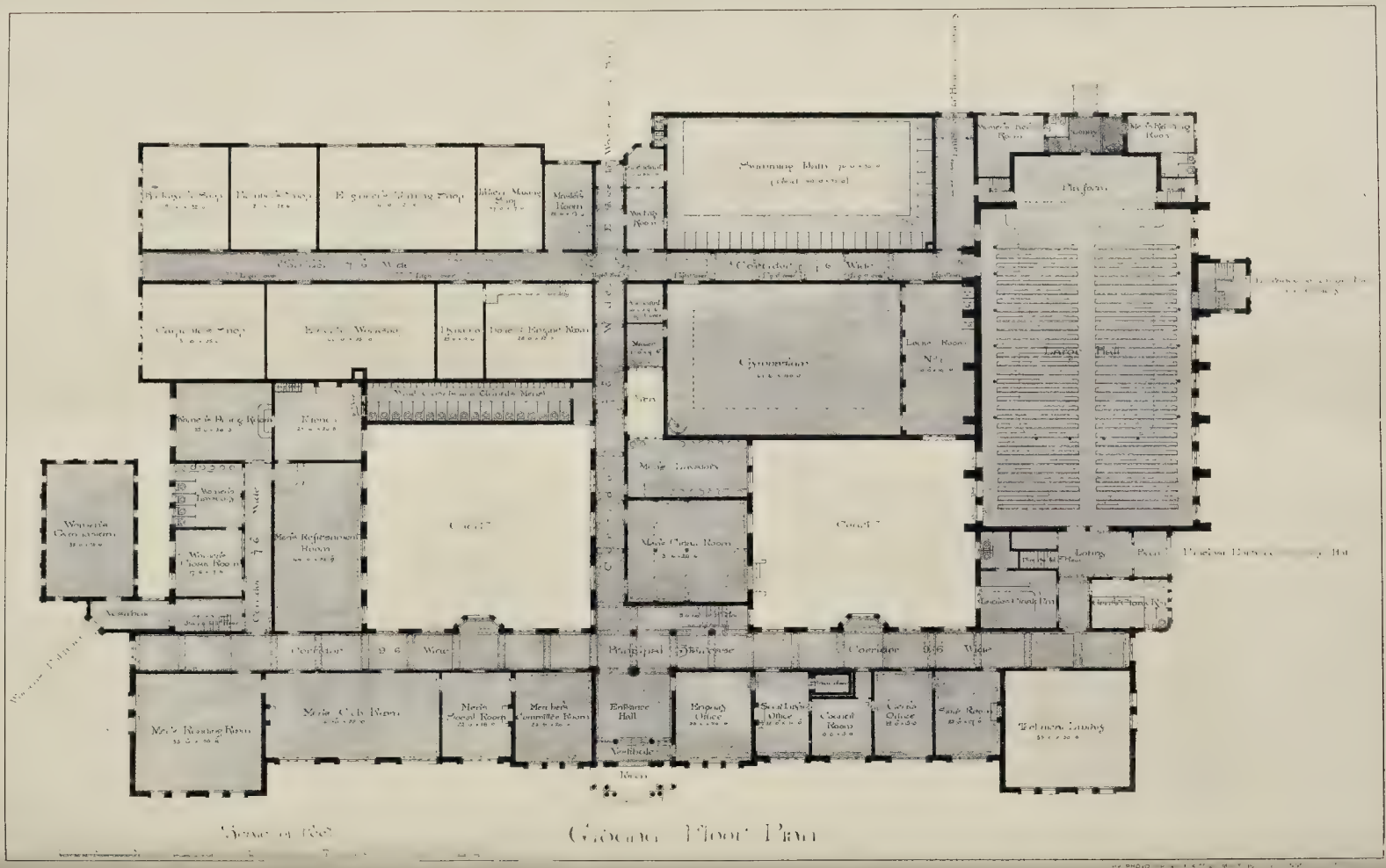
P



ITUTE.—Mr. E. W. Mountford, F.R.I.B.A., Architect

.W.


10 5 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 Feet



Ground Floor Plan



BRONZE CISTERN OR WELL HEAD BY ALFONSO ALBORGHETTI. 1559.

IN THE COURTYARD OF THE DOGES PALACE. VENICE.



Marble Well-Head from S.S. Giovanni Paolo. Now in the Museum. Venice.

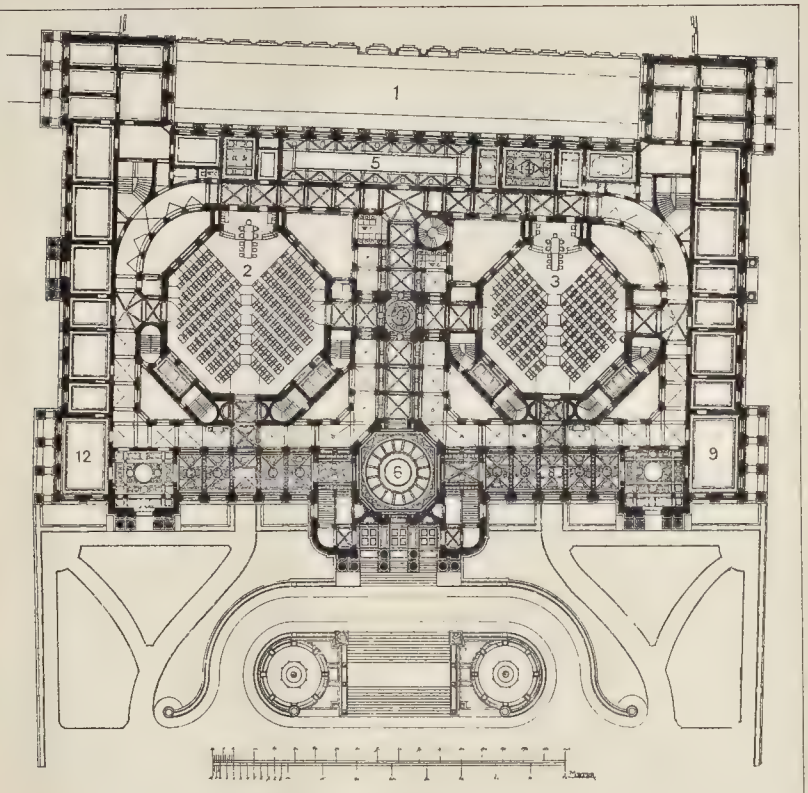
PHOTO LITHO. BRAHAM & C° 22 MARTIN'S LE CANNON ST LONDON

ITALIAN WELL-HEADS. RENAISSANCE.


Ground Plan.
Carpenter's Shop
Smiths Shop
Class Room.
Class Room
Class Room
Corridor
Hall.
Head Masters Rm
Lavatory
Under Masters Rm
Music Room
Book Store
Scale of Feet
Welsh Intermediate Education Act.
Design for a School for One Hundred Boys.
T.E. Pryce Archt. 35 Bedford Row. W.C.



SWEDISH HOUSES OF PARLIAMENT AND



PLAN OF PARLIAMENT HOUSES

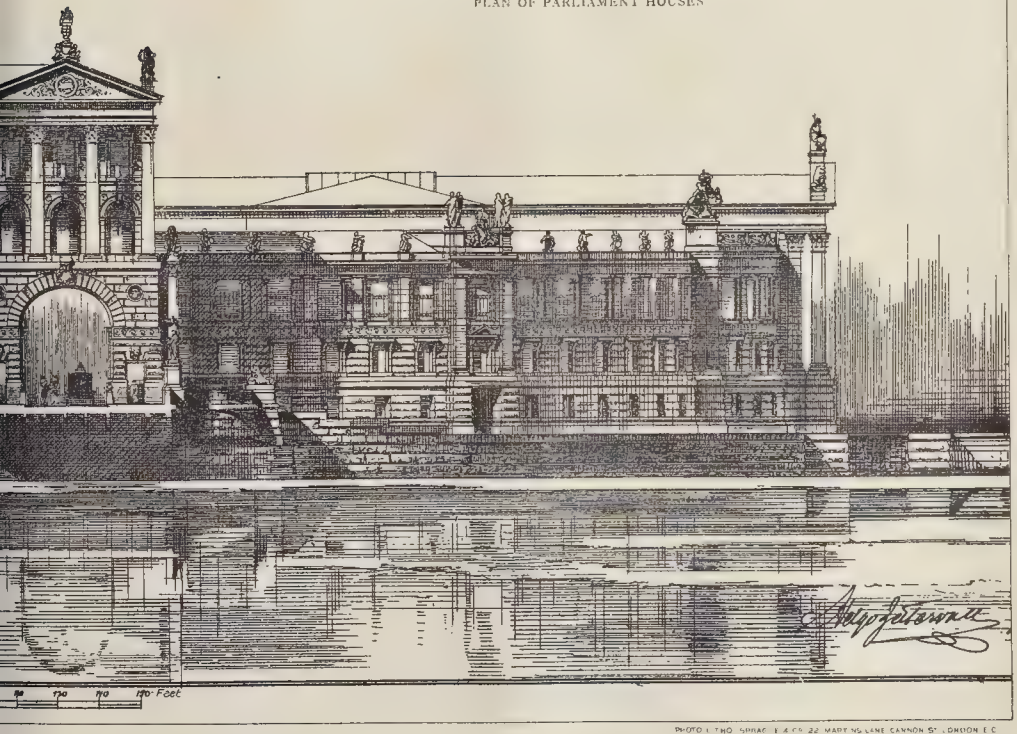


PHOTO L. THO. SPRAGUE & CO. 22 MARYNS LANE CANNON ST. LONDON E.C.

WEDEN.—Herr Helgo Zettervall, Architect.



SAN PEDRO, SEVILLE.—From a Drawing by Mr. H. V. Lanchester, A.R.I.B.A.

Nicolo de Conti, the other by Alfonso Alborghetti in 1559, are both in the courtyard of the Doge's Palace. They received but little injury during the fires in 1574 and 1577 which destroyed the courtyard of the palace.

The one given on our plate shows the characteristic features of the later Cinque Cento ornamentation in the terminal figures holding wreaths, which was largely introduced into French Renaissance ornament.

The marble example is from a series now in the museum at Venice, and it shows a peculiar treatment of the figure introduced with the acanthus foliage together with heads of lions and a female head at the angles. The carving of the whole is vigorous and skilful. This cistern was erected in the courtyard of the Church of SS. Giovanni e Paolo, Venice.

RICHARD GLAZIER.

THE NEW SWEDISH HOUSES OF PARLIAMENT AND BANK OF SWEDEN.

A COMMITTEE having been charged by the Swedish Parliament of 1888 with inviting designs for the new Houses of Parliament and Bank of Sweden, to be built on the so-called Helgeandsholm, situated in the stream that flows through Stockholm, and in the immediate vicinity of the Royal Palace, the Princes' Palace, and other monumental buildings, that body framed a programme, and invited Swedish architects to compete; but, as previously stated in our columns, no design tendered met with the full approval of the jury. In consequence, the Committee was empowered to commission one of its members, Herr Helgo Zettervall, an eminent architect, and chief of the Crown Building Office, to prepare designs and plans for the new buildings. The front and side elevation of the main design, and the plan for the Houses of Parliament, are illustrated in this number; in the succeeding number we will give the back elevation, showing the Bank building, with the plans of the two principal floors.

The Houses of Parliament are entered through the open portico forming the central section of the main façade, the portico leading into a vestibule, which is a lofty hall running through two stories and lighted from above. From the sides of the hall stairs lead to the upper and lower stories, whilst on a level with the vestibule are the *foyers* of the Houses and the refreshment bars. Just opposite the great entrance archway to the vestibule, a vaulted gallery opens leading to the common hall, the rooms of the Presidents, Cabinet Ministers, &c. Adjoining the gallery referred to are the cloak-rooms, dressing-rooms, &c., which are partly lighted from the courtyards and partly from the vestibule and the *foyers*—whence these rooms are also freely accessible. The main entrances of the two Houses are from the *foyers* and the side entrances, partly from the gallery referred to, whereby both Houses are conveniently connected, partly from the end corridors, while the club-rooms are closely connected with the Houses to which they belong. The club-rooms are in turn connected with the *foyers*, partly through the corridors referred to, and partly through the refreshment-roooms. Separate entrances are provided for the Presidents, Ministers, &c., at the back of the tribunes. In each House there are two large boxes below the public galleries, for the use of distinguished visitors. The legislative chambers are lighted partly from above, and partly through four great windows at the sides, looking upon the courtyards. The offices of Parliament are confined to the wing abutting on the Drattninggata Passage. Separate staircases lead to the same from the vestibule on the ground-floor, as well as to the stories above, and they are lighted from above. These offices are also conveniently connected with the rooms of the Presidents, and, through the library, with the club-rooms. A fifth staircase, common to all stories, is found in close proximity to the common hall, as well as lifts in convenient places. The staircases for the press, the general public, and distinguished visitors are not accessible from this part of the building. Five staircases lead to the top story, no main staircase being required for the offices and committee-rooms situated here. On this floor are situated, but distinctly apart, the public galleries for both Houses, the diplomatic gallery, and the press gallery. The latter communicate with each other, and to each are attached two writing-rooms, telephone, and cloak-rooms. From this floor there will be several reserve exits for use in case of fire or panic. On the upper floor are also found the library and the offices attached thereto. A lift runs from the top to the bottom of the building here. To the bottom floor of the building there are several entrances, and here are located the principal restaurant, certain offices connected with the treasury, telegraph, and telephone offices, besides others.

The Bank of Sweden will form part of the Parliamentary building, and be built in a semi-circle on the opposite side towards the Vasa Bridge.

As regards the construction and execution of the buildings, the material used will be granite, sandstone, and limestone for the exterior, iron for the roof—which is to be sheeted with copper, and cement and iron for floors and walls. Naturally, all the rooms in the bank building will be fireproof. The entire building will be lighted by electricity and heated with steam.

This building enterprise is the greatest which has taken place in Sweden since the building of the Royal Palace. The cost of the structures is estimated at about 380,000*l.*, but this does not include the cost of the site—a very valuable one, as being situated in the most central and fashionable part of the Swedish capital. This site belonged to King Oscar, who, taking a lively interest in the undertaking, has generously presented it to the nation. The value may be estimated at some 50,000*l.* at least.

The new buildings will form an angle with the Royal Palace, facing the Grand-square of Gustavus Adolphus.

References to Plan of Parliament Houses.

1. Drattninggata Passage (principal street in Stockholm).
2. First Chamber (seating 186 members).
3. Second Chamber (seating 212 members).
4. Cabinet Ministers.
5. Common Assembly Room.
6. Vestibule.
7, 8. Foyers.
9. Reporters' Room.
10, 11. Restaurants.
12. Newspaper Room.

DESIGN FOR SCHOOL.

IN furtherance of the policy inaugurated by the Welsh Education Act of 1889, Mr. Henry Tate placed at the disposal of the Committee for North Wales a considerable sum of money, part of which was to be expended in procuring typical designs for schools. As the system of instruction under which knowledge is to be imparted to the pupil was,—and still is,—undecided, the particulars issued to architects were necessarily of a somewhat shadowy nature. No site, real or imaginary, was given, and, except that a building providing for the intermediate and technical education of 100 scholars from twelve to sixteen years old at a cost of 2,000*l.* was to be planned, the designer was left free to evolve for an ideal system an ideal plan, upon an ideal site. Four equal premiums of 20*l.* each were offered, one of which was awarded to the design illustrated. The plan consists of a large hall, on the eastern side of which are placed three class-rooms, fitted with single desks and giving a floor space of 15 ft. per scholar; rooms and lavatory for head- and under-masters, and a book store are at the southern end, with the school entrance adjoining on the west; while at the northern end of the hall are placed a music-room, carpenters' and smiths' workshops, and on the upper story chemical and physical laboratories and an art school. Lavatories, &c., and a large dressing-room are placed in a block separate from the main building; cloak cupboards only being provided round the hall.

THOS. EDWARD PRYCE.

THE MANCHESTER SHIP CANAL.—It is stated in the *Times* that the Manchester Ship Canal Company have decided to present a petition to Parliament as soon as possible after Easter for leave to introduce a Bill authorising them to raise a further sum of three millions for the purposes of their undertaking, the interest on the proposed loan to be guaranteed by the Corporation of Manchester on the credit of the rates. Copies of the draft Bill have been sent to Manchester, and in due course notices of the intention of the Company will be advertised in the London and Manchester Press and in the *London Gazette*. The statutory time for the introduction of private Bills having elapsed, it will be necessary for the Standing Orders Committee to consider the petition in order to decide whether the case is one for dispensing with the standing orders.

THE LONDON COUNTY COUNCIL.

THE last weekly meeting of the London County Council prior to the Easter recess was held on Tuesday afternoon in the County Hall, Spring-gardens, the Chairman, Sir John Lubbock, presiding.

The Housing of the Working Classes.—The Housing of the Working Classes Committee brought up an important report as to the method of dealing with unsanitary areas and for facilitating the erection of sanitary dwellings upon all such areas dealt with by the Council. The recommendations of the Committee were as follow:—

"1. That the Council, in all cases when satisfied upon report made by the Housing of the Working Classes Committee that a scheme proposed by resolution of a Vestry or District Board is one which it is proper should be dealt with under Part 2 of the Housing of the Working Classes Act, 1890, and be contributed to by the Council, and subject to the necessary estimates to be submitted to the Finance Committee, do contribute from one-fourth to one-half, according to the circumstances of each case, of the net cost of carrying into effect such schemes.

2. That the total expenditure sanctioned on the part of the Council by way of contribution for the year ending December 31 next be limited to the sum of 50,000*l.*

3. That the Finance Committee be instructed to consider all applications made to the Council by district authorities for loans to meet expenses incurred in carrying out schemes under Part 2 of the Act of 1890, with a view to loans being made for this purpose as authorised by section 46."

Mr. Beachcroft proposed the following amendment to the first recommendation:—

"That it is highly desirable that the provisions of part 3 of the Housing Act, 1890, under which the Council is empowered to acquire land for the purpose of erecting houses or cottages for the working classes, should be extended so as to allow of land when so acquired being leased to companies or persons willing to erect dwellings under and subject to conditions imposed by the Council; that a petition be presented to Parliament accordingly, with a view to such alteration of the law as is required, and that it be referred to the Parliamentary Committee to carry out this resolution."

After some discussion,

Mr. Harrison stated that Mr. Beachcroft was willing to withdraw his proposal in favour of the following:—

"That the resolution, as framed by the Committee, is not satisfactory, and that the following be substituted—'That the Council do contribute to schemes under Part 2 of the Housing of the Working Classes Act, 1890, when such schemes deal satisfactorily with unsanitary areas, and when need of such contribution is shown to the satisfaction of the Council.'"

Mr. Harrison's proposal was carried, as against the first recommendation of the Committee. The second recommendation was withdrawn, and the third agreed to.

The Site of Millbank Prison.—The adjourned report of the Housing of the Working Classes Committee, in reference to the Millbank Prison site, stated that on November 19 the Council resolved that a letter be addressed to the Secretary of State inquiring whether the Government would be willing to dispose of eight acres of the site for the erection of artisans' dwellings at the price of 2,000*l.* per acre. The answer received was to the effect that the Secretary of State was advised that there was no plot of land on the site for which 2,000*l.* an acre would even approach the fair market price, which the statute bound him to ask. In order to decide the value a valuer appointed by the Government met the Council's Valuer, and whereas the first placed the value at 5,500*l.* the other put it at 5,000*l.* The Committee had now received an offer of the eight acres for 40,000*l.* The Committee had, however, to take the following facts into consideration:—1. It was agreed by both valuers that the value of the whole site was 5,000*l.* an acre. It seemed reasonable to conclude that the part at the back must be worth considerably less. 2. The cost of purchasing the approaches might add to the price. 3. The Valuer considered that, if the Council were to purchase the land for 4,000*l.* an acre, and offer it to artisans' dwellings companies, subject to the building conditions of the Council, there would be a loss of about 11,000*l.* (without special permission by Parliament the Council would be obliged to build and hold under Part III. of the Housing Act, 1890). 4. The uncertainty of the cost of the foundations. 5. The uncertainty as to whether the Home Secretary would consider the site as providing accommodation for persons displaced by schemes perhaps at some long distance away. 6. The giving up of an acre to roads and an open space. For the first four reasons the Committee had come to

the conclusion that a fair price for the eight acres in question was 24,000*l.* When the back portion of the site (for 3,000*l.* an acre) was laid out by the Council, and by the making of approaches one side of the whole site had been opened out, an increased value would attach to the remainder of the site, which might make the average on the whole to exceed 5,000*l.* an acre. The Committee therefore recommended—

"That a letter be addressed to the Secretary of State in the above sense, accompanied by an offer of 3,000*l.* an acre for the eight acres being the back portion of the Millbank Prison site."

Mr. Beachcroft moved an amendment to refer the report back to the Committee, with an instruction to consider whether 4,000*l.* an acre would not be a fair price to offer for the site or a part of it. The amount proposed to be paid by the Committee was totally unreasonable, and if they meant to do business they should make a reasonable offer.

This amendment, and others which followed it, were lost, and the recommendation was ultimately agreed to.

Proposed Purchase of Tramways.—The Highways Committee reported that they were unanimously of opinion, upon the estimates and evidence placed before them, and upon the legal advice given to them, that the purchase of the London Street Tramways Company could be effected without any risk of loss to the ratepayers. They were also of opinion that the transfer of ownership to the Council would be a public benefit, and would satisfy a widely-felt public desire, and they therefore recommended:—

"(*a*) That the Council do, under the statutory provisions in that behalf, exercise its right to require the London Street Tramways Company to sell to the Council the tramways and works and undertaking authorised by the London Street Tramways Act, 1870; (*b*) that the Clerk be directed to call the proper statutory meeting of the Council, required by the Tramways Act, 1870, in order that the Council may consider the matter, and, if it sees fit, pass the necessary resolution for the purpose referred to."

The former of the foregoing resolutions, if adopted, would be merely a preliminary approval of the principle of purchase, but it would not bind the Council to proceed with the actual purchase, since for that a special meeting would be necessary.

This was agreed to.

Sky-signs.—The first paragraph of the report of the Building Act Committee was as follows:—

"1. We desire to report, for the information of the Council, that we have unanimously passed a cordial vote of thanks to Mr. Arthur Cates, one of the Vice-Presidents of the Royal Institute of British Architects, for the valuable assistance afforded by him in giving evidence before the Committee of the House of Commons upon the Council's Sky Signs Bill."

Having transacted a great deal of other business, the Council adjourned until Tuesday, April 7.

FREE LECTURES TO ARTISANS AT CARPENTERS' HALL:

MR. THOMAS BLASHILL ON "THE CARPENTER AND THE HOUSE."

The fifth lecture of this series* was delivered on Wednesday evening, the 11th inst., by Mr. Thomas Blashill, F.R.I.B.A., his subject being "The Carpenter and the House." The chair was occupied by the Rev. Henry Wace, D.D., Principal of King's College, and there was a good attendance.

The lecturer commenced by observing that things innumerable might be said in praise of the house. From the darkest ages each separate section of mankind emerged to our view ready-furnished with its own special form of house, that had developed with its growth and expanded to its wants, fitting itself upon the family just as the garment was fitted upon the man. The house had made frozen regions habitable; it had made the tropics tolerable, and under its shelter civilisation had sprung up, blossomed, and borne fruit. It had been the parent and nurse of industries. Generations of craftsmen had lived and thriven by it, calling themselves its builders,—more truly they might admit that it had built them. It created the carpenter; it had endowed him with axe and saw, chisel and plane, all the tools in his chest,—for these were developed out of the demands of the house. Even yet it had not done for him all that was possible, but would conduct him onward and upward so long as civilisation increased its demands upon the house and found its agent in the carpenter. A timber house could, perhaps, be made more interesting by art than any other house, and the artist was the carpenter.

A timber house was quickly built, dried during construction, was damp-proof if properly put together, heat and cold resisting, and durable,—if properly protected from the worm and from fire. But for these enemies it would be perfect; indeed, till they got the mastery over it, it was perfect. But for fire and for careless construction and maintenance, we should now be in possession of a wooden domestic architecture, enriched with all the picturesqueness of the Mediæval period, developed with the changing taste and the growing wants of modern life, and made interesting by the art which the carpenter, beyond other artists, seemed to delight in exercising upon it. And in spite of fire and decay, a very large proportion of the houses in our old towns still consisted mainly of wood, the original fronts being only concealed by plaster or tiling. Though the outward exhibition of timber construction in towns was now practically forbidden, there was a great deal of scope for artistic carpentry in internal work; and in country places, where houses could be built on open sites and of moderate height, a timber house was often the best possible kind of building: it was comfortable, picturesque, popular. After briefly tracing some evidences of the early use of wood in building, and showing that many forms found in early stone buildings were directly copied from the forms of pre-existing wooden buildings, the lecturer mentioned a few examples of different kinds of houses made wholly or partly of wood. In the earliest times, before the invention of tools that would slit logs into thin slabs or boards, the log had to be used nearly round as it grows. Our own oak-trees were fixed upright in the ground close together, and when they could be cut with saw or adze the inner side was made flat and the edges close-fitted. The round side, with its bark, was put outside, forming a picturesque and warm-looking wall, as we might see at the ancient Church of Greenstead, near Epping, to this day. In countries where the fir or pine grew naturally the common practice was to lay the logs horizontally upon each other to form the walls, halving them together at the corners of the house, and making them fit upon each other more or less closely, according to the importance of the building. In Switzerland and in Sweden that mode of building had been developed to a very high degree, so that there were no more picturesque houses in Europe than those which were known as Swiss châlets or cottages, but which were sometimes important houses carefully and even sumptuously designed. Each district in Switzerland had its own distinct style of architecture, so that there was very great variety. Sometimes the houses were covered with very small thin pieces of wood cut to a pattern and overlapping like weather-tiling; and when a house of fir or pine had been exposed to the sun and weather for a century or more it put on a colour, varying from dark grey to reddish-brown, that was exceedingly agreeable. The ordinary "Swiss cottage" put up in this country was quite a different thing; and the fanciful cottages or lodges so abundantly used in connexion with French ornamental gardening were equally far removed from the original source of their inspiration. The very peculiar climate which we enjoyed was unfavourable for the use of such soft woods as fir or pine in external architecture. They might be used in very hot countries or in very cold countries, but not in a country where the weather was always changing, and where warm, moist days might be experienced at any time of the year. In the countries where these soft woods were used, there was a summer when they were well protected by being kept intensely hot and dry, and a winter during which they were equally preserved by the frost. But the great source of timber for building purposes in this country had always been the oak, which did not readily lend itself to the kind of construction seen in Switzerland. It supplied a large number of long and short curved pieces and of short straight pieces, but not many long straight pieces. It was therefore best utilised in framings where the long sills and heads were few, and where the posts and braces were numerous and of moderate length. Of construction of that kind, the old buildings in England, France, and Germany comprised a great variety of beautiful examples. The panels might be filled in with stone or brick, or might be lathed or wattled and plastered. There was, until lately, in Bishopsgate-street, a very fine example known as Sir Paul Pindar's house,* the front of which was now in the South Kensington Museum, and was being repaired, in order to be set up as an example of Mediæval London. Probably everybody thought that the panels were of plaster; but they turned out to be of oak, 3 in. thick, carved with projecting ornament, so that the whole design was carpenters' work. The lecturer next proceeded to speak of the interior decorative carpenters' work of old houses, referring especially to the panelling of walls of rooms fitted up in the sixteenth and seventeenth centuries. On the whole, he thought that the panel was the proper place for the best class of ornament, rather than the stiles and rails, although these should also be moderately ornamented, and that inlaying was the method most generally adapted to that purpose. After briefly noticing the woodwork of the houses of Saracenic and Mohammedan people, as well as that of India, which were capable of affording useful hints to us, the lecturer referred to the wooden architecture of China and Japan, from which he thought we could not learn much. It had been said that the Japanese carpenter did everything differently from the European carpenter. For instance, he drew his plane towards him when he was taking off a shaving, and he used his hand-saw on a similar principle. In both China and Japan the construction seemed to be very flimsy and unscientific. Great use was made of the bamboo, in ways that were very interesting to observe, but this could hardly be called carpentry. Slightness of construction, however, might have its advantages. Japan was one of those countries where earthquakes were common. A building which was constructed of slight, flexible materials, very firmly bound together at the junctions of the different parts, would yield to an earthquake shock, and be uninjured by it. But there was another mode of construction in common use with the same object. The Indian builder would construct the walls of his house by setting up a double framework,—one frame being flush with the outer face of his external wall and the other frame being set up inside it flush with the inner face, the timbers being about 4 in. square, and a space of about 2 ft. being left between the two frames. It was like a mason's scaffold, and several short pieces like putlogs were run across and secured with pegs to the two frames, their ends showing both inside and outside. When he had constructed the ground-story he filled in solidly with brickwork the whole space occupied by the two frames, and the distance that separated them, so that it was beyond the power of earthquakes to shake down a structure so firmly tied together. That form of construction would perhaps be suitable for use in New Zealand, where shocks of earthquake, generally slight, were so constantly occurring that they were hardly a matter for observation. The student of old work and of materials used in carpentry would see that timber architecture differed materially from architecture in stone. It was not an architecture of column and entablature and arch and corbel, but of post and beam and flat ceiling and far-projecting bracket. Timber adapted itself to such features externally as verandahs, projecting windows, covered balconies, and dormers. In European timber-architecture the angle-post was one of the finest features. Rising from its stone base, it curved out boldly to support the overhanging corner of the story above, and was often richly panelled or carved with foliage, or even with some statue or group of figures. Many interesting examples were illustrated in Mr. Corder's recent book on the angle-posts of Ipswich.* Referring to modern work, the lecturer said that a good deal of what was called "half-timber" building had been done in this country without much attempt to advance the art beyond that which we saw in the old examples. Although many country houses had been built in that manner, some being of considerable size and very carefully constructed, none seemed to equal the best old buildings in the richness and the interest of their ornamentation. In America, from necessity or from choice, the construction of wooden houses might be said to be a living art. The great obstacle to the use of good ornament in woodwork in situations to which it was adapted was its cost. As a rule our carved work was too much elaborated and too much polished up. The good old carving was generally cut out boldly and quickly, and left somewhat in the rough. The work was such as any one accustomed to the use of chisel and gouge and mallet could execute without special training of the hand. He would only need to study old examples and natural objects, and to possess some fancy or imagination of his own, to enable him to make his work interesting as well as decorative. It was only in the very highest kind of work that great delicacy of finish was desirable,—work executed in the finest materials to be placed near the eye in buildings meant for very important uses. All ordinary work was quite within the reach of the carpenter who had taken some pains to qualify himself for it, and the best work, most exquisitely finished, was not beyond his reach. To put the matter plainly, he ventured to say that the least-educated person in that hall was probably better educated than any of the men who designed and executed the beautiful old woodwork in the buildings of the past. As a rule those men must have been either master carpenters or ordinary workmen paid by the day. If the work was done by contractor having more than one building in hand at one time, it is highly probable that those men were too much engaged in their business arrangements to do more than guarantee that the design should be appropriate to the purpose. Village journeymen carpenters must have done the rest. The earlier part of the seventeenth centur

* For brief reports of the previous lectures see pp. 151, 174, 231, *ante*

* This house, which was latterly a tavern called "The Paul Pindar," was illustrated in the *Builder* for Oct. 11, last.

* "The Old Corner-Posts of Ipswich." By John S Corder. Ipswich: S. H. Cowell, 1890. Reviewed, an two or three illustrations reproduced, in the *Builder* fo Oct. 18, last, pp. 310, 312.

was a time when an immense quantity of good timber houses were being constructed. In 1632 a contract was made by John Abell, carpenter, who was credited with a great deal of that kind of work. He lived in a very secluded village in Herefordshire, and could not have had much of a workshop. He contracted with Viscount Scudamore to cover the ruined church of Abbeydore with roofs "sufficient, stronge, and handsome," and "firmely and decentlie" framed. That was perhaps the first recorded instance of a church restoration. He began by cutting down trees upon the estate for his ladders, windlasses, and other engines and went on to fell other timber with which to make his roofs, the contracted price of 110*l.* being paid to him in instalments, as it might be now. Upon his tombstone he was styled "architector," a fine name then in use by master workmen who designed as well as built. There was some probability that the old Town-hall at Leominster was one of his works. The modern practice would be to call in an architect, from whose drawings everything would have to be done, with the result in general that such houses as were built by John Abell and his contemporaries could hardly be produced now. The stiffness and poverty of the pencil lines drawn to scale and by square were reproduced in the building, and the carving that gave life to the old designs was too expensive for general use. The lecturer said he had known cases in which the builder had gone to great trouble in order to find clean, straight oak timber to suit the design as it was drawn out, although if the timber, had been used crooked and crabbed as it was found, the effect would have been more characteristic and interesting. The carpenter who had to work with the architect should know something of detail and ornament as the architect knew it, and not merely the rules of construction. The architect should know more about practical carpentry, and, though he might be the designer of the whole, should feel able to leave more of the detail, which would give character and interest to the building, to the taste and skill of the man who had to carry it out. As an aid to that end, the Carpenters' Company was to be warmly commended for the establishment of its classes for wood-carving, and for its other efforts in the promotion of technical education—efforts to which they all wished success.

PROFESSOR BANISTER FLETCHER ON "ARCHITECTURE AND ITS CIVIC AND COMMERCIAL VALUE."

The sixth and last lecture of the series was delivered on Wednesday, the 18th inst., Sir John Lubbock in the chair. Architecture, said the lecturer, had a definite object over and above that of giving pleasure. She had to serve the needs of man, and was therefore a useful art as well as a fine art. She, therefore, recognised utility as the basis of her work, on which she erected a superstructure of her own with grace of proportion and beauty of ornament. Without such additions, utility alone would give us, not architecture, but only building. Having illustrated this point by means of drawings of some well-known public buildings (such as Greenwich Hospital) as they are and as they would appear if reduced to mere building, he proceeded to argue that the difference of cost between an architectural and a merely utilitarian building need be little or nothing; but even if it cost more, architecture, he contended, had its civic value, inasmuch as through its agency the citizen gained (1) the enjoyment of the beautiful; (2) the use of widened and ennobled thoroughfares; and (3) brighter surroundings. In conclusion, the lecturer spoke of the commercial value of architecture, which, he said, was certainly the lowest ground on which he could base its claims, although he feared it was the one most likely to command attention in the present age, when we continually heard the question, "Will it pay?" He ventured to answer that question by a very old example. What is now known as Belgravia was formerly called "The Five Fields." The land was deemed to be of little value, and lay so low and so near the river as to be called "marshy." How did Cubitt, the great builder, do with that land when it came into his possession,—by building small houses, as many would have done, considering such houses best adapted to so unpromising a site? No; he adopted quite a different treatment of the land. He made the land of great value by putting thereon palatial residences,—as they were considered at the time,—and thus caused land which was comparatively worthless to acquire great value. A more recent instance was afforded by Hankey's residences, Westminster (ugly though they were). Another still more recent illustration was afforded by the Westminster Town-hall and the residential flats near it, which were built on the site of what was, not so very many years ago, almost the lowest slum of London. By the expenditure of large sums of money in architectural work the ground value of the land had been raised enormously. Similar results had followed similar procedure in the provincial towns. Tradesmen and others testified that they found it to their advantage, from a business point of view, to carry on their trade in premises which were architecturally inviting and attractive.

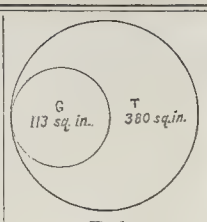


Fig. 1.

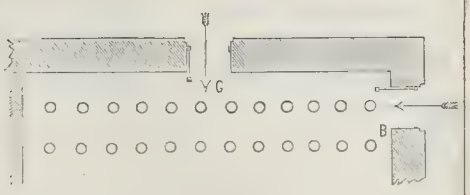


Fig. 2.

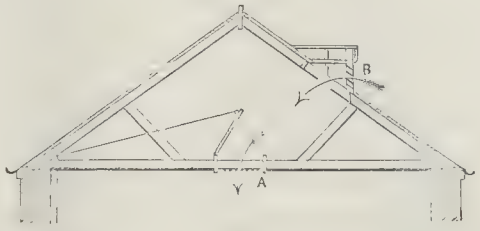


Fig. 3.

Correspondence.

To the Editor of THE BUILDER.

THE SANITARY CONDITION OF SCHOOLS.

SIR,—On page 215, "Sanitas" asks me to give a short explanation of my objections to the arrangements as present adopted by the Glasgow School Board for the ventilation of the schools along with my suggestions as to improving same.

My objections to the present condition of these Board Schools are that they are, generally speaking, exceedingly deficient in means for keeping the atmosphere of the rooms pure, healthy, and comfortable for either the pupils or their teachers. In many of the school-rooms there is no proper provision for an adequate supply of fresh air, and especially not for an adequate supply of warm fresh air in winter. And in this respect the West-end schools are, perhaps, the worst. One would have supposed that the new high school when it came west would have been a model, but in the rooms I was in it has not got beyond glass hoppers in the windows for some, and in others nothing. There were some large vertical iron gratings in the walls, which I was going to give credit for as being inlets, but I was at once told "Not so; those are merely the remnants of a former style of heating, and the flues are built up."

Then as to the outlets at the ceiling, where there are such, these belong to the Lilliputian order, nothing Brobdingnagian in this respect in our Board—in some cases one diminutive outlet-grating, about 10 in. by 5 in., for a roomful of seventy, in other cases two such. In another West-end school for a large room holding about 110 pupils, and with three teachers in it, the outlet was only one small 12-in. diameter pipe, as at G, fig. 1, giving only one square inch of outlet for each individual, whereas in a Selkirkshire school with a room in it also for 110 pupils, the size of its main outlet-pipe is 22 in. diameter, as at T fig. 1. Instead of the Glasgow school having less than a third of what the country school has, it should have considerably more. In the ground flat of the same school, however, the case is worse still, as these rooms have no outlet-pipes at all.

The windows are hung like doors, as in fig. 2, and when I looked in, the window in one room was open, as at B, letting in the outer air on the left sides of the boys, while in another room the window was open as at G, letting the air in on the backs of the girls.

At another three-flatted very large school the air of the infants' room, holding about 150, was simply disgusting. The ventilating provision is so meagre and bad I was glad to get out of this room, it felt as bad as a midden. All the rooms in the two lower flats felt musty and disagreeable. In my opinion both scholars and teachers are being slowly poisoned in these schools.

At another school the provision for outlet ventilation is as in fig. 3, so that the intended outlet A is often a disagreeable inlet. The teachers told me: "We are never free of colds here," and one young lady remarked: "I am just newly back from being a month off with rheumatic fever."

In a number of the three-flatted schools the same wind-acting ventilator on the roof that serves for one or more top flat rooms also, has pipes joined into it from the rooms in lower flats, with the result that the ventilator may get its principal supply from the top room close to it and take very little away from the lower rooms far away from it, and more especially when, as I have seen it, the pipe from the top rooms was the *largest!* In one test I made, the speed of the outgoing air from the lowest room was only about one-tenth of that from the top room.

The Board seems to have had no proper understanding or appreciation whatever of the necessities of the case, or of the interests involved; but in its long seventeen years' grand opportunity for progressive work, it has in great part been moving in a circle, even the newest schools opened last year affording admirable examples of "How not to do it."

The Board imagined it could do better than its architects, but what has its enthronement of incapacity and monopoly come to? As a sanitary engineer I could not conscientiously point to even one of its schools as hygienically passable. Many landlords in Glasgow have had to pay damages to their tenants for letting them unhealthy houses. I expect shortly to see parents suing our School Boards for injuring their children by the unsanitary condition of the schools the children are forced to attend.

Instead of really saving the money of the public by the bad way in which things have been done, the Board has been actually wasting it. A new Board is now being elected, and it is to be hoped it will rectify matters as soon as possible,—during the summer vacation at latest, of its own accord, and without compulsion.

In my opinion, the present automatic system in vogue is a miserable failure, and these large Glasgow schools cannot be properly ventilated without mechanical power, and in this opinion I am at one with the late Professor Carnelley.

W. P. BUCHAN.

SKY-SIGNS.

SIR,—I trust that the suggestion made by you on page 224 of last week's *Builder* will be acted upon, and that frequent painting or other protection will be exacted from the possessors of sky-signs. They demand special care,—something quite beyond the care devoted to ordinary buildings. The repairs and painting should be done just before the new certificate is required, and the surveyor should have notice that the work is going on, and thus see exactly how things stand. Workmen used to such feats would test the swinging letters, the guys, and bolts, as directed. An inspection at a time when repairs were not going on would be a different process,—the discovery of obvious defects might then be the limit.

AN OBSERVER.

COMPTON WYNYATES.

SIR,—Mr. Rimmer's valuable drawings would be still more valuable if the points of the compass were shown on the plan. He speaks in his description of the chapel as being on the left on entering the court. Perhaps he will explain, through your columns, how the house does lie. N. S. W. EAST.

THE LABOUR COMMISSION.—In the House of Commons, on Tuesday, Mr. W. H. Smith, in answer to Mr. Howell and Mr. John Ellis, said:—It is not, I think, desirable that I should give the terms of reference without giving at the same time the names of the Commissioners, and this last information is not yet complete, owing to the delay which has taken place in answering the invitation of the Government to serve on the Commission. I hope, however, that the Commission will be completed in the course of a day or two.

The Student's Column.

VENTILATION AND WARMING.—XII.

FRICTION OF AIR IN DUCTS AND FLUES.

THE question of the friction of air against the sides of ducts and flues is one that has received considerable attention at the hands of physical inquirers. The difficulties of the subject are considerable, and have been approached from different points of view; hence we now have a number of formulæ of varying appearance, but, in general, taking account of the same factors in the problem, to a greater or less extent.

It is generally admitted that the amount of friction varies directly—that is, increases or decreases in the same ratio, with the square of the velocity, and also similarly with the length of the duct and with its periphery—that is, with the extent of the frictional surface, which is, of course, the product of the length and periphery of the duct. On the other hand, the amount of friction varies inversely with the sectional area of the duct—that is, it decreases as the area increases, and increases with the decrease of the sectional area.

As long ago as 1847 Mr. Hawksley, at the Institution of Civil Engineers, quoted a formula for the ventilation of mines by means of a difference of temperature in down-cast and up-cast shafts, which takes account of the frictional loss we have above mentioned. The formula referred to is $v = 96 \sqrt{\frac{T - t}{T + 448}} \frac{D\,s}{m\,l + 368\,s}$

where t = temperature of the air in the down-cast shaft, T = temperature of the air in the up-cast shaft, D = depth of shaft in feet, m = periphery of transverse section of air-course in feet, s = area of section in feet, l = length traversed by current in feet, v = velocity of current in feet per second.

In 1871 the same authority quoted the following formula for the velocity of moving air in a circular pipe: $v = 1{,}368 \sqrt{\frac{h\,d}{l}}$, where h = pressure of head, d = diameter, and l length of pipe.

Box gives us for a calculation of the head due to friction alone the expression $H = \frac{C^2\,L}{(3{\cdot}7\,d)^5}$

where d = diameter of the pipe in inches, L = length of pipe in yards, C = cubic feet per minute, and H = the head (or difference of pressure at the two ends of the pipe) in inches of water.

We have not hitherto used the term "head" in these papers, as, without explanation, it might cause misapprehension in the minds of some students. The term "head" is very generally and somewhat loosely used in speaking of hydraulics and pneumatics. In its original and proper significance, "head" is the vertical height of the horizon or topmost level of a fluid above the point to which the "head" is measured. From the "head" can be obtained at once the theoretical velocity of movement *in vacuo* at any point of a particle of fluid from what is called the rule of Montgolfier, which is $v = \sqrt{2gH}$, g being the acceleration of velocity in each second of time, viz., 32·18 ft., and H, the "head," or height of descent. This H is also called, and perhaps more properly, the "velocity head," or "head of velocity." In Chapter VIII. we have used the expression, "column of velocity," to denote that which we are now considering as "velocity head." Inasmuch as velocity may be communicated to, or induced in, a particle by pressure or force applied at a point instead of by gravitation, it has become the practice to speak of this pressure or force as "head," when dealing with fluids, mainly because such pressure or force can be expressed in terms of a column of a standard fluid such as water or mercury, the energy of which depends upon its height or "head." Hence we hear of "frictional head," by which is meant the pressure or force necessary to enable a body of fluid to overcome the resistance of friction in a pipe or duct, and which can be represented by the weight of a column of a certain number of inches of water or mercury. So too we have "entry head" to denote the amount of effective force lost by passing through an opening under various conditions, examples of which were given in our last chapter. Again we have the specialised terms "pressure head" or "dynamic head" which latter is defined by Rankine thus: *The dynamic head of a particle is its potential energy per unit of weight.*

The amount of "head" can be expressed in terms of the height, either in inches, feet, or other lineal measurement, of a column of water or mercury,—the standard liquids,—or of any other liquids; and also in terms of weight per unit of base, or of atmospheres, that is, of a column of air, so many times that of the normal atmosphere.

Rankine gives the following formula for the amount of the friction on a given surface, S, in an air duct:—$R = f\,\rho\,S\,\frac{v^2}{2g}$, where S is the surface of contact, that is, the product of length and periphery of the duct, v = the velocity, ρ = the weight of an unit of volume of the fluid, and f = the co-efficient of friction which, for air and other gases, is 0·006 nearly. This expression, it will be seen, takes account of, not only the velocity and frictional surface, but also the weight of the fluid per unit of volume; that is, the specific weight.

Now the specific weight of air varies with its density, and the density varies with the temperature and with the pressure. With a perfect gas flowing in a duct, in which no loss of temperature occurred through conduction, a certain amount of heat would be generated by the friction and this would cause the expansion of the gas, and hence an increase of velocity, so that the velocity lost by the friction would be regained by the increased expansion caused by the heat developed by that friction.

Since, however, these conditions do not positively exist in any actual case of the transmission of ordinary atmospheric air through any ducts that can be practically constructed, and since the temperature of the air has an immediate and positive effect upon its density the specific weight of air in its influence upon friction may be taken into account by a consideration of its temperature. This has accordingly been done by Fischer in the somewhat elaborate-looking formula which he has proposed for the friction of fluids. This formula is $p = w \left(\frac{1}{v} + 20\right) \frac{\gamma_0}{1 + a\,t} \cdot \frac{l\,u}{q} \cdot \frac{v^2}{2g}$ where p = the loss of pressure (or head) in kilograms, equivalent to the weight lost in a head one square mètre in sectional area; γ_0 = the weight of 1 cubic mètre of the fluid in kilograms reduced to the standard temperature of 0° centigrade; t = the actual temperature of the fluid; a = the co-efficient of expansion for each degree for the particular fluid; l = the length of the duct or pipe in mètres; q = its sectional area in square mètres; u = its periphery in mètres; v = the velocity per second in mètres; g = 9·81 mètres, and w = an empirical co-efficient dependent upon the fluid and the nature of the frictional surface.

This formula by the factor $\frac{\gamma_0}{1 + a\,t}$ takes account of the weight of the fluid, and can accordingly be used for compressed air, or for heated air as for any other fluids.

In dealing with compressed air, it is, however, important to remember that in any long channel, with compressed air passing through, the same velocity may be observed at both ends, but with varying amount of compression, for if the compression of the air diminishes, its bulk increases, and the velocity is so maintained; thus, we may have no loss of velocity, but a loss of pressure, due to the absorption of energy by friction. If the compression is the same at both ends of the duct, the velocity will have been affected by the friction, but in practice this would seldom occur.

The value of the empirical co-efficient w in the above formula has been found by experiment to be 0·0003 for air in smooth circular pipes, and from 0·0004 to 0·0007 for ducts of brickwork or masonry, according to the smoothness or otherwise of the periphery.

A simpler expression derived from this formula gives us a value for the co-efficient of loss of head C, corresponding to the similar factor as given for various cases in the last chapter; thus $C = \frac{K\,U\,L}{4\,S}$ where U = the periphery, L = the length, S = sectional area, and K = a co-efficient varying with the w in our last formula. This holds good for ducts of any form, but may be still further simplified for square or circular ducts, where the periphery and sectional area are, of course, equally dependent upon the diameter. Hence we now have $C = \frac{K\,L}{D}$ where D = the diameter of square or circular ducts.

The value of K is thus obtained:—$K = 4\,x \left(\frac{I}{v} + 20\right)$; that is 4 times the first factor in the formula above. x has the values mentioned above, *i.e.*, 0·0004 to 0·0007 for atmospheric air in built channels, and v = the velocity of air current.

GENERAL BUILDING NEWS.

ADDITIONS TO THE ROMAN CATHOLIC CATHEDRAL, EDINBURGH.—This church consists of a nave without aisles, having accommodation for about 1,000 persons. At one side there was a chapel, recently destroyed by fire, with a vestry behind it. These are to be dispensed with, and aisles are to be formed on either side, which will, of course, necessitate the removal of the present side walls, and the roof will then be supported by arcades in the usual manner. In rear of the cathedral, there is a priest's house, the site of which, it is contemplated, may be used for a future extension. The plans, which were prepared by Mr. John Biggar, architect, show two towers flanking the façade towards Broughton-street, which may be erected when funds are available. The original building was designed by the late Mr. Gillespie Graham, and is in the Perpendicular Style. It was erected in 1813 at a cost of 8,000*l.*, and measures 110 ft. by 57 ft. The new aisles will accommodate about 1,000 persons. Operations are to be commenced at once, and it is expected that the work will be completed before the commencement of next winter.

EXTENSION OF THE WARNEFORD HOSPITAL, LEAMINGTON.—On the 18th inst., Lord Leigh laid, with Masonic honours, the foundation-stone of a new wing of the Warneford Hospital. The Committee recently purchased from the Dowager Countess of Aylesford an acre of land on the east side of the hospital, at a cost of 1,000*l.*, and Mr. Keith D. Young, of London, prepared the plans of the new buildings, which include two wards for in-patients, with fourteen beds each, and an operating theatre and surgeons' rooms on the ground floor. There will also be extensions to the nurses' home, a new sanitary block for the children's ward, and a women's accident ward. The new wards will be built upon the "pavilion" system, in order that a second block may be added when sufficient money is provided. The Committee accepted the tender of Mr. J. S. Kimberley, of Banbury, amounting to 13,180*l.*

ALTERATIONS TO SALISBURY INFIRMARY.—The tender of Mr. C. A. Hayes, of Bristol, for 4,837*l.*, has just been accepted by the committee of the Salisbury Infirmary, for the alterations to the building. The greater portion of the additions is between the children's ward and the accident and Bartlett wards; it is of three stories in height, of fireproof construction, and reached by a stone staircase to all floors, which also connects the children's ward. An entrance-lobby, waiting-room, clerk's office, lavatories, &c., are the alterations to be made on the ground-floor. On the first floor the building contains the accident side ward, bath-room, scullery, lavatory, and offices; on the second floor, another ward, with attendant nurse's sitting-room and bedroom, scullery, and necessary offices, and, disconnected from this, the bath-room, lavatory, scullery, and offices of the Bartlett ward. The wards are to be covered with oak boards, and the corridors and offices are to be of tiles, both laid upon fireproof floors. The walls of the corridors and offices where new, are to be lined with glazed bricks. The exterior of the building is a plain Renaissance treatment, executed in Doulting stone. In addition to this, the Bartlett and accident wards are to be laid with oak, upon floors of fireproof construction; iron-roofed balconies are to be provided to each ward, with French casements leading to both of them. A new lift is to be provided, and a side ward floored and fitted up as a reception ward for accidents. Better ventilation, and a new system of heating for the added portion of the Infirmary are also included in the work to be done. The architects are Messrs. John Harding & Son, Salisbury.

NEW CHAPEL, WALKLEY.—The new chapel which has been erected by the Primitive Methodists in South-road Walkley, near Sheffield, was formally opened on the 22nd inst. The front elevation of the building is towards South-road. Internally, galleries have been erected on all four sides, that behind the pulpit being appropiated for the choir. Both galleries and floor are benched in pitch pine, 500 sittings being provided, and the floor is sloped upwards towards the rear of the chapel. The front of the gallery is broken up by panelling, while the windows on three sides are glazed with figured glass, bordered with ruby and amber. The chapel is heated by a combination of hot air and hot water. The main entrance doors open into a lobby from which there are two entrances to the area of the chapel, and stairways on each side to the galleries. At the back are a minister's vestry and two class-rooms, and sufficient land has been reserved for the erection of schoolrooms when that becomes possible.

The contractors for the erection of the chapel are Messrs. Atkinson, Row, & Petfield, of Sheffield. The masonry has been done by Mr. W. May, and the heating apparatus has been furnished by Messrs. Wright Brothers, Attercliffe.

FISH AND VEGETABLE MARKET, DUBLIN.—The foundations for a new fish and vegetable market are being laid on the site for the building between East Arran-street and Fisher's-lane, Dublin. The contractors are Messrs. Thomas Connolly & Co. The market will form a parallelogram 330 ft. long and 295 ft. broad. The design has been supplied by Mr. Harty, the Borough Engineer. There will be six entrances, and the passages leading through the market will be broad. The front will be of coloured bricks, with ornamental dressings. The ironwork has been contracted for by Mr. Lysaght.

ROMAN CATHOLIC SCHOOL AT LOANHEAD, EDINBURGH.—On the 17th inst. Archbishop Smith laid the foundation-stone of a Catholic school at Loanhead. Mr. Rhoderic Cameron, of Edinburgh, prepared the plans for the work, the cost of which is estimated at about 1,000*l.* The main building will be T-shaped, and consist of a school-room, class-room, and infants' gallery, with cloak-rooms, &c. Accommodation is to be provided by it for about 230 pupils, and the rooms will be capable of conversion into a hall to seat 450 people. The building is to be chiefly stone, found in the district.

SCHOOLS: LLANELLY.—On the 16th inst. the higher grade schools, Llanelly, which face the People's Park, were thrown open for the reception of scholars. The schools cover an acre of ground, and will accommodate 322 girls and 322 boys, and the cost of construction has been 4,350*l.* The building is Gothic in style and has a frontage of 120 ft., and is 50 ft. high to the ridge, with an additional 20 ft. to the top of the central turret, which ventilates all the class-rooms by means of wooden shafts. The external walls are of local stone, with Bath stone dressings. The architect is Mr. E. H. Lingen-Barker, of Hereford. The contractors were Messrs. Brown, Thomas, and John, and the School Board clerk of the works, Mr. W. Morgan.

NEW REREDOS, ST. MATTHEW'S CHURCH, SHEFFIELD.—A new reredos has just been erected in the Church of St. Matthew, Sheffield. The base of the reredos is of alabaster, and supports two gradines also of alabaster. On this is the reredos proper, which consists of an oil-painting by Westlake representing the adoration of the shepherds, in a large and carved gilt frame. The work has been carried out in Sheffield by Mr. Frank Tory, from designs by Mr. J. D. Sedding, of London, and has cost about 270*l.*

ADDITIONS TO GORGIE PUBLIC SCHOOL, EDINBURGH.—This school, which has received extensive additions during the past twelve months, and belongs to the St. Cuthbert's and Dean School Board, was opened on the 16th inst. The building was previously only one story, but now another flat has been added to it, and the wings of the structure have also been extended, accommodation being provided for 1,094 children. The cost of the additions has been about 7,300*l.* Mr. Robert Wilson, Edinburgh, was the architect.

NEW FREE CHURCH AT ABBEYHILL, NEAR EDINBURGH.—On the 21st inst., the ceremony of laying the memorial stone of the Smith Memorial Church in course of erection at Parson's Green, Abbeyhill, was performed by Mr. Charles J. Guthrie. The church, which occupies a site at the corner of the Portobello-road and the Willowbrae-road, Piershill, is to be in the decorated Gothic style of architecture, with a square battlemented tower at the north-east corner, reaching to a height of about 80 ft., and a slated spire, 40 ft. higher, rising out of the tower. Internally the edifice will be about 90 ft. long and 40 ft. wide, being seated for about 500 persons. Underneath the church will be a hall, together with a session-house, ladies' room, lavatories, and heating chamber. The building will be constructed of Corncockle stone, and is expected to cost about 5,000*l.* Mr. Sydney Mitchell, of Edinburgh, is the architect of the building.

RE-OPENING OF BONHILL FREE CHURCH, DUMBARTON.—This building, which during the past twelve months has been undergoing various additions and alterations, was reopened on the 22nd inst. The present alteration included the taking down of the side walls of the central part and making the interior of the building about 68 ft. long by 55 ft. wide. The old plaster roof has been removed, and instead, there is an open timber roof. The accommodation has been increased by about one-third, and the building is now seated for about 700. A new staircase for the gallery at the end is erected, and a new hall, under which is the heating chamber and cellarage. The cost of the present alterations is about 1,800*l.* The alterations have been carried out from designs by Messrs. Campbell Douglas & Morrison, of Glasgow.

STAINED GLASS AND DECORATION.

NEW WINDOW, WORLE CHURCH, SOMERSET.—A window has just been placed in the east end of the chancel of Worle Church by the Rev. W. F. Rose, M.A., the artists being Messrs. Clayton & Bell, London. The scenes depicted are the eight principal events at the close of our Lord's ministry.

MEMORIAL WINDOW, ST. JOHN'S CHURCH, ALDERCAR.—A stained glass window dedicated to the memory of the late Rev. James Hawkins, M.A., has been placed in the east end of St. John's Church, Aldercar, Derbyshire. The three centre lights bear the figure of Peter, James, and John, while the remaining portions are filled up with tracery work. The work of staining has been entrusted to Messrs. Dunne Bros., of Birmingham, while the fixing has been in the hands of Mr. Ball, Long Eaton.

DECORATION OF THE CHURCH OF ST. JOSEPH, DUBLIN.—The Church of St. Joseph, Berkeley-street, has recently undergone internal decoration. Surrounding the altar a series of sacred representations are painted in niches, with mosaic gold background. The walls of the church have been painted in oils in tint of Caen stone colour, with dado borders, and window splay decorations. The spandrels between the arches in the nave have in the centre of each spandrel a medallion bearing the figure of an Irish bishop's mitre and crozier on gold ground, surrounded by conventional and symbolic scroll-work in colours. The ceilings of the transepts have been painted in cobalt, and powdered in gold and white stars. This work has been designed and executed by Mr. R. Mannix, of Dublin. A carved pulpit, with canopy in Riga oak, has been erected from designs by Mr. G. Ashlin, and executed by Messrs. Beaky.

STAINED WINDOW, ST. THOMAS'S CHURCH, STOURBRIDGE.—In the chancel of St. Thomas's Church, Stourbridge, a stained-glass window has been erected by Mr. Charles W. Collis, in memory of his wife. The window, which is the centre one in the chancel, is 16 ft. high by over 8 ft. wide. The subject illustrated is "The Ascension," the figures being very nearly life-size. The work has been carried out by Mr. Samuel Evans, of West Smethwick.

MEMORIAL WINDOW, ULGHAM CHURCH.—A window in memory of the late Canon Grey has been erected in Ulgham Church, Northumberland, by the parishioners. The subject is our Lord's charge to St. Peter. The ornamental detail of the window is composed of early Grisaille work. The window has been designed and executed by Mr. G. J. Baguley, of Newcastle.

FOREIGN AND COLONIAL.

FRANCE.—The prize entitled "de reconnaisance," founded at the Ecole des Beaux-Arts by American architects, has been awarded this year to M. Chausemiche, pupil of MM. André & Laloux. The Muller-Salinée prize, for the student who has gained the highest marks in the architectural course of instruction at the Ecole, has been given to M. Delabarre, pupil of MM. André & Moyaux. ——M. Poilpot has just completed a panorama of the coronation of the Emperor of Russia, which is intended for the Moscow Exhibition. ——The monument to Victor Noir, by M. Lalou, which was in the Champ de Mars Salon last year, is shortly to be set up in the Cemetery of Père Lachaise.——On the occasion of the last fine art exhibition at Munich, the Bavarian Government bestowed the Order of Merit of St. Michael on the painters Cazin, Courtois, Roll, Carrière, and Binet. ——The intended enlargement of the offices of the Bank of France will necessitate the destruction of a curious relic of old Paris, the house, No. 48, Rue de Valois. The house, which crosses the Radziwill passage, is the highest in Paris, having nine stories approached by an oddly-constructed staircase of double curvature.——M. Chéret, well known as a designer of decorative placards, has been appointed curator of the Musée Grévin in place of M. Grévin, the caricaturist, who has retired on account of ill-health.——M. Decauville, the founder, has just finished the casting in bronze of the national monument commissioned from M. Carrièr-Belleuse by the Government of Costa Rica. The monument includes seven figures over life size. It will be exhibited at the next Salon.——At the Académie de Beaux-Arts three painters, MM. Jean Paul Laurens, Jules Lefebvre, and Edouard Detaille, are candidates for the place vacant by the death of Meissonier. The election will be made in a few days.——The jury of the Salon has been constituted, consisting of twenty titular jurists and twenty supplementary ones. Among the first are MM. Roll Cazin and Mathey; among the latter MM. Duez, Besnard, Le Blant, and E. Lambert, who are all concerned also in the New Salon. ——Two fine tapestries are on exhibition at Versailles. They are after the design of Lebrun, and were found recently in an old château in Brittany.——There is a proposal to establish a railway line between Havre and Pont-Andemer, to be carried under the Seine in a tunnel, as the bed of the river in that neighbourhood is very unfavourable for building a viaduct.——The death is announced of M. Hoschedé, an art-critic and one of the founders of the *Gazette des Beaux-Arts*. The death is also announced of M. Berthelet, architect, of Lyons, at the age of 73.——At Langres (Haute Marne) a retrospective fine-art exhibition is to be opened on August 13, to remain open for a month.——There has been a competition at St. Brieue (Côtes du Nord) for the best scheme for water supply. The first premium has been given to M. Moussu, engineer of St. Brieue.——The Minister of Public Works has appointed the following architects,—M. Joly and M. Bouvard, M. Marcel Lambert and M. Paulin—as Inspecteurs-généraux des Bâtiments Civils.—— The second competition for the decoration of the Galérie Lobau at the Paris Hôtel de Ville is to be shortly decided. The competitors are MM. Bourreau, D'Espouy, Dubufe, Picard, and Risler.

BERLIN.—The foundation-stone to the proposed Memorial Church to the deceased Emperor William I. was laid by the Emperor and Empress on Sunday last, in presence of the Ministers, Generals, and all Court, State, and Municipal dignitaries present in the city, cannons thundering during the ceremony. The design of the building is by Herr Baurath Schwechten, and was selected in a limited competition.—Last week a celebration in memory of the deceased Vienna architects, Friederich von Schmidt and Th. von Hansen took place under the auspices of the "Vereinigung Berliner Architekten." The address in memory of Schmidt was spoken by Herr Fritsch (editor of the *Deutsche Bauzeitung*), and Baurath Ende made the memorial speech to Hansen.—An exhibition of the drawings of Von Schmidt has been opened at the Royal Technical College.—On Monday, the 16th, Herr Oberbaurath F. Adler read a paper at the "Architekten Verein" on the Olympian discoveries. The Professor in illustrating his lecture made use of some proof-sheets of the lithographs intended for the important publication on "Olympia," about to be brought out by the Government under the direction of Professors Curtius and Adler.—Regierungs Baumeister Jaffér (of the Ministry of Public Works), Germany's official delegate at the last Melbourne Exhibition, has been elected to look after Germany's interest at the coming London German Exhibition.

NORWAY.—A new Norwegian Minister of Public Works has been elected, Herr Theodore Nysom, in recent years President of the Polytechnical Association of Christiania, and an engineer of high standing.——The Norwegian Association of Engineers and Architects has adopted a resolution demanding from the authorities a closer supervision of building work.——In consequence of the great number of applicants for places, the public technical college at Christiania is to be enlarged at a cost of 1,600*l.*

SWEDEN.—At the last meeting of the Building Association of Stockholm the subject under discussion was "On Control over the Erection of Private Houses," and it was decided to appoint a committee for framing detailed regulations for the exercise of such control, which are to be discussed at the next meeting.——A curious action has been commenced in Stockholm, the relatives of a well-known engineer, Herr Brunius, who was suffocated by coal-fumes whilst engaged in the new mansion of Herr F. Bünsow, claiming 2,800*l.* compensation in respect of his death. The defendant denies being responsible for the occurrence.——The port of Ystad, in southern Sweden, is to be considerably enlarged and improved.——A new Town-hall has been completed in the town of Kristianstad, at a cost of 5,000*l.*, exclusive of site, &c. The style is Dutch Renaissance, the architect being the late Herr Isæus.——The Industrial Credit Company is building new bank offices in Stockholm, the architect being Herr Erik Josephson. The building is in the Gothic style.——At a recent meeting of the Swedish Tourist Association, Prof. Hildebrand, the well-known antiquarian, drew attention to the great architectural interest attaching to the old churches in the lonely island of Gothland, in the Baltic, and their number. During a journey of 260 miles he had found no less than fifty-five ancient churches. They all date from the Early Gothic period. They are built of the excellent sand-stone and lime-stone found in the island.——It is intended to acquire the remarkable altarain the ancient Cathedral of Upsala for the archæological church to be built by the Northern Antiquarian Museum in Stockholm.——Prof. Julius Kronberg, the artist, has succeeded in putting together, with great skill, the portions of Gobelin tapestries recently discovered in the old royal castle, and they have been hung in the Palace at Stockholm. They represent scenes from the Psyche myth. Professor Kronberg is at present engaged in painting a series of large frescoes on the grand staircase of the Royal Palace.

THE GATES AND BARS IN ST. PANCRAS.—It will be remembered that last year an Act of Parliament was passed authorising the County Council of London to arrange for the removal, upon certain conditions, of the gates now existing in several streets in the parish of St. Pancras. Those conditions having now been fulfilled, the Clerk of the Council has issued a formal notice addressed to the Duke of Bedford, ordering his Grace, as the ground landlord of this portion of St. Pancras, to take down and remove these obstructions within three months from the present date, and to repair the footway and roadway on which they stand, "together with any sheds, fences, rails, or posts, or other erections." The gates and bars specified in this notice are those across Upper Woburn-place, Gordon-street, and Torrington-place; and a similar notice has been issued to a Mr. Alfred Henry Harrison, ordering him in like manner to remove the gate and bar on his property which runs across Sidmouth-street, near Gray's Inn-road and King's Cross.—*Times.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
Ornamental Iron Bridge	Darlington Corp.	Not stated	April 15
*Public Hall and Offices, Earlestown	Newton-in-Mackerfield Commissioners	50l. 25l. and 15l.	May 14
Alterations and Additions to Town Hall	Kendal Corporation	30l. 20l. 10l.	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Repair of Highways	Dynas Powis Highway Board	E. R. Lewis	Mar. 31
Residence at Asylum, Thorpe, Norwich	Visitors	T. H. & Heslop	do.
Catholic Institution, Kingstown, Dublin		J. Kelly Freeman	do.
Bowling Green Pavilion	Salford Corporation	*Official*	do.
Two Dwelling-houses, Archfield-street, Gloucester		J. F. Trew	do.
Sewerage Works	Hove Commissioners	*Official*	April 1
*Works and Materials	Pinchley Local Board	do.	do.
*Fire-escape Staircases at Workhouse	West Ham Union	F. J. Sturdy	do.
Twenty Cases of Labourers' Dwellings, Road-making, &c. Randalstown, Ireland	C. J. Webb	J. Lanyon	April 2
Sewerage Works	Ystradyfodwg Loc. Bd.	J. W. Jones	do.
Additions to Board Schools, Treharris	Merthyr Tydfil Sch. Board	J. Williams	April 3
Main Pipe Sewer, Hartshead	Sheffield Corporation	G. Alsing	do.
Painting and Painting Buildings, &c.	M. R. Co.	*Official*	do.
Petty Sessions Court, Great Witley	Worcestershire Standing Joint Committee	H. Rowe	do.
Asphalt Works, Keswick	Cockermouth Union	G. D. Oliver	April 4
*Planing Building and Constructing Concrete Floor and Roof	Sheffield United Gas Light Co.	F. W. Stevenson	April 6
Main Sewerage Works	Houghton-le-Spring Local Board	D. Balfour	do.
Stables, &c. Fairwater, Cardiff	Edgar David	Halliday & Anderson	do.
*Re-forming Road	Acton Local Board	D. J. Ebbetts	do.
*Road Works	Hendon Local Board	S. S. Grimley	do.
Twenty Houses, Regent-street, Ferndale	Dufferyn Hotel Building Club	M. Morris	do.
New Road, Banks, Fencing, &c.	Llandaff Righway Bd.	Jas. Holden	do.
Alterations and Additions to Asylum, Exminster	Devon County Council	E. H. Barbottle	do.
Tubes, Wires, Fittings, &c.	Lancs. & Yorks. Rail.	*Official*	do.
*Paving Streets	Camberwell Vestry	do.	do.
Sixty-nine Cottages and Road Works, Cadoxton, South Wales	Riverside Cottage Bldg Co. Lim.	E. M. Bruce Vaughan	April 8
Reservoir, Pipes, Hydrants, &c. Ellesby	Henderwell (Yorks) Local Board	*Official*	do.
Primitive Methodist Chapel, Lemington, Northumberland		Geo. Race	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Branch Stores and Agent's House, Thornton, near Halifax	Queensbury Indus. Soc	H. Hodgson	April 9
Parish Church, Castlebar, co. Mayo	Rev. P. Lyons	W. G. Doolin	April 10
Retaining Wall, Iron Fence, &c.	Hampton Local Board	J. Kemp	April 11
*Road Materials	County of Chester	S. Bull	do.
*Erection of Hoarding	Holborn Union	H. Saxon Snell	April 14
New Schools, Bristol-road	Bath School Board	W. J. Willcox	do.
*Sewerage Works, Mitcham-lane	London County Council	*Official*	do.
*Paving, &c. Works, Rosebery-avenue	do.	do.	do.
Two Tenements, Saltmarket	Glasgow Impt. Trust.	do.	do.
Works at Manse, Second Donegore, Ireland		Andrew Murdock	April 15
*Works and Materials	Strand Bd. of Works	*Official*	do.
Widening Bourne Bridge, Ipswich	Committee	E. Buckham	
		H. Miller, Jun.	April 20
Sewerage Works, Hirwain-street	Aberdare Local Board	*Official*	April 22
*New Offices	New Barnet Valley Local Board	F. W. Shenton	April 27
*Construction of Storage Reservoir, &c.	Bristol Water Co.	T. & C. Hawksley	April 30
*New Grammar School, Chelmsford	King Edward VI. Grammar School	H. A. Cheers	No date
Re-building 70 rods Stone Wall, Intack Caldbeck	A. Rilson		do.
Three Houses, New Leeds	Mr. Evers		do.
Extension of Workshops, Bramley Leeds	I. Haley & Co.		do.
Two Shops and Dwelling-houses, Ilkley	W. Scott	A. Mawhall	do.
Sinking Two Pits (450 yds. deep), Maesteg, South Wales	North's Navigation Collieries, Ltd.	Forster, Brown, & Rees	do.
Two Villas, Oak	Dr. C. Boutlen		do.
Reservoir, near Durham	Sacriston Colliery		do.
*Re-building Tower, &c. Wadsedon Church, Bucks	Rector & Churchwardns	W. White	do.
Warehouses and Stables, Matilda-street, Sheffield		A. R. Walker	do.
Public School, Macdonald	Rutherglen (N.B.) Sch. Board	Walker & Cameron	do.
Warehouse, Marylport-street, Bristol		H. J. Jones	do.
Fire Brigade Station	Leicester Corp.	W. E. Keites	do.
*Road Works	Newtown (N. Wales) Local Board	*Official*	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Clerk of Works	Norwich Corp.	3l. weekly	April 2
*Sewerage Works Manager	Richmond Main Sewerage Board	250l.	April 6
*Sewerage Works Foreman Engineer	do.	2l. 10s. &c.	do.
Mechanical and Electrical Engineer	Bristol Corporation	300l. per annum	May 1
*Assistant Secretary	Architectural Assoc.	100l.	No date

Those marked with an Asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv. *and* vi. *Public Appointments, p.* xviii.

MISCELLANEOUS.

THE MOVEMENT FOR THE REGISTRATION OF PLUMBERS.—The Mayor of Bradford (Councillor Hammond) presided on the 17th inst. at a large public meeting held in the Bradford Technical College, when a District Council was elected, including the Mayor, the Chairman of the Sanitary Committee, the Medical Officer, and a number of master and operative plumbers, to carry out the national registration system. Besides a large gathering of representatives of the plumbing trade, including Mr. J. Allen (delegate from the United Operative Plumbers' Association of Great Britain and Ireland), there were present Alderman F. Priestman, Alderman Moulson, Dr. Hime, Mr. Cox (Borough Surveyor), Mr. W. T. McGowen (Town Clerk), and Sir Philip Magnus, and the Clerk of the Plumbers' Company (as a deputation from London). ——Professor A. Crum-Brown, of Edinburgh University, delivered a lecture on "Lead and other Metals and Alloys," at Dundee, on the 20th inst. The lecture was given under the auspices of the District Council for Forfar, Perth, and Fife for the National Registration of Plumbers. There was a large attendance of master and operative plumbers. In the absence of Lord Provost Mathewson, who was detained in London, Bailie McCulloch presided, supported on the platform by Professor Frankland and Dr. Lennox. In the course of his very instructive lecture, Professor Crum-Brown explained the nature and properties of different metals, directing his remarks more particularly to describing the alloys of lead and tin, suggestive illustrations of which he also gave. Professor Frankland, in moving a vote of thanks to the lecturer, pointed out the responsibility that devolved on plumbers in regard to the public health, stating that if plumbers would attend to drains and water fittings in a scientific manner, the community would be immensely benefited. A vote of thanks having been passed to the chairman, the meeting was brought to a close by Certificates of Registration being presented to a number of master and operative plumbers.

HOUGHTON-LE-SPRING SURVEYORSHIP.—Mr. William Taylor, of Eastgate, has been appointed sanitary inspector to the Houghton-le-Spring Union, in succession to Mr. Osselton, who is going to Dumfriesshire, to fill the office of chief sanitary inspector to the County Council.

THE COUNTY COUNCIL AND OVERHEAD WIRES.—The inquiry by a Select Committee of the House of Commons upon the Bill promoted by the London County Council for, principally, causing the removal of overhead telephone wires into subways, and prohibiting aërial lines in the future, had a strange ending. Besides this provision, the Bill proposed to give power to officials to enter houses to examine and supervise wires, and also to authorise the exaction of payment by wire-owners for such inspection. The National Telephone Company objected to the measure as calculated not only to put them to enormous expense in removing their existing wires and making subways, but to render their present single-wire system utterly useless, inasmuch as only double wire, with elaborate insulating covering, would be practicable underground. They further objected to a proposal to make them register all their wires as another serious cause of trouble and expense; and eventually the opposition all round was so successful that the Committee, while passing the preamble of the Bill, struck out all reference to subways and to making the Company transfer their wires to subways, omitted the suggested right of entry for inspection, and also declined to sanction the proposed exaction of payment for supervision. Presumably there was something left of the Bill, seeing that it was duly reported to the House by the Committee, but the excisions mentioned were somewhat destructive, to say the least of it, of the main purposes of the measure. It rarely happens that a Bill is slashed about to this extent, and yet passed, —"with amendments."

THE ENGLISH IRON TRADE.—While the English iron maket is very quiet—in fact, quieter than at any previous period of the year—its tone is exceedingly week. The decline in values would be still more marked than it is were it not for the fact of manufacturers keeping out of the market from sheer inability, owing to comparative dearness of fuel and high wages, of accepting the low prices offered. There has been another drop in pig-iron, induced by a further fall in warrants. Scotch makers' iron is from 1s. to 2s. a ton lower; Cleveland pig has declined 1s. a ton. There has been a corresponding easing off in Southern brands, while Bessemer pig in the North-west has lost 2s., with hematite warrants 1s. cheaper. There is a dead dulness in finished iron, but so far no actual reductions are announced in rates. For this, if they are to come, we must wait for the quarterly meetings. Steel is equally little inquired for, with a slightly better demand for shipbuilding steel, however. Shipbuilders are not by any means slack as yet, but they will be soon unless the demand for tonnage sets in more actively than it is at present. Work in most branches of the engineering trade is well maintained.—*Iron.*

EAST PRINCES-STREET GARDENS, EDINBURGH.—The plans of Mr. E. Milner for the treatment of the East Princes-street Gardens under the scheme for the enlargement of the Waverley Station, arrived last week in Edinburgh. Mr. Milner had carefully examined the gardens about six weeks ago, and the plans submitted to the House of Lords Committee were the result of his personal inspection of the ground. According to the *Scotsman*, the present size of the East gardens will not only be maintained, but will even seem to be slightly increased. On the north side of the railway the space scheduled, measuring from the present retaining wall, is 58 ft. at the east end and 40 ft. at the west end, next the Mound tunnel. Along the extended boundary, represented by the rope line with which the citizens are now familiar, a new low retaining wall will be built. Along the line of the present wall there will be a row of iron pillars, and between each pillar and the new wall an iron girder. Built between the girders will be a series of brick archways to form a roof for the portion of the garden covered in. On the top of this roof there will be placed 4 ft. or 5 ft. of earth, and the bottom of the garden along its whole length will be filled up 10 ft., or to the level of the earth on the top of the roof referred to. The garden will in this way present a flat surface with an area as large as it is at present. The plans show along the edge of the railway a line of shrubs to screen the view, and the rest of the garden is laid out in an ornamental way, which on the plan commends itself to the eye on account of the excellent character of the design. The south side of the garden will be treated in exactly the same manner in respect of constructive details, and the manner in which the garden will afterwards be laid out.

ELECTRIC LIGHTING IN CALCUTTA.—It is stated that the Howrah Bridge is shortly to be lighted by electricity, which will be a very great improvement upon the present system of lighting. At present, indeed, the bridge is very badly lighted, there being no lights at all upon the movable section, which is 200 ft. long. The remainder of the bridge and the boat-opening below are also very indifferently lighted. It is now proposed, however, to place thirteen arc lights on the roadway of the bridge, each of 2,000-candle power, and four similar arc lights for the boat-openings, with eighteen strong incandescent lights for the signal-stations, watch-house, and engine-house. The aggregate power will be 34,384 candles, and, to prevent the possibility of failure, the plant will include a spare engine, boiler, and dynamo. The contractors are Messrs. Laing, Wharton, & Down, who have been selected to supply the electric lighting plant for the Kidderpore Docks, and who number among their more recent works the installations at St. Pancras Station and the Chelsea Military Exhibition. The cost of the Howrah Bridge plant is to be 42,050 Rs., and this sum will be provided out of surplus revenue.—*Indian Engineer.*

MEETINGS.

TUESDAY, MARCH 31.

Birmingham Architectural Association.—Mr. A. Harrison on "Bosbury Church." 7.30 p.m.

WEDNESDAY, APRIL 1.

Civil and Mechanical Engineers' Society.—Mr. W. Lee Beardmore on "Compulsory Registration of certain Buildings as to their Sanitary Efficiency." 7 p.m.

FRIDAY, APRIL 3.

Institution of Civil Engineers.—Students' Visit to the Mechanical Laboratory of the City and Guilds of London Central Institution, Exhibition-road, South Kensington. 2 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

5,818.—STAIRCASES: *R. Howson.*—The improvement which is the subject of this patent consists in placing a spring or springs underneath the footboard or "tread" of each step so as to deprive it of its usual rigidity, and to impart to it the property of yielding somewhat to the pressure of the foot in ascending and descending.

5,719.—CEMENT: *W. R. Taylor.*—According to this specification, liquid fuel is used alone or in conjunction with solid fuel to aid and assist in the burning of the cement material. This burning is also facilitated by feeding the material in a pulverised state into a rotating chamber, heated by the combustion within it of powdered coal and air.

6,088.—KILNS: *E. Brock.*—By this invention gas and air are supplied to these heated kilns, so that they may be utilised for burning the bricks, and when a number of these kilns are used in rotation they are worked regeneratively, *i.e.*, the heat given off in cooling by one of them may be caused to heat the air for burning the gas in the next one; and the hot waste products of combustion from a kiln undergoing the firing process heats up one or more kilns previously to being fired, or heats air to use with the bottom supply of gas.

13,318.—WINDOWS AND SASHES: *W. J. E. and T. J. E. Henley and Thomas Spurrier.*—The sash which is the subject of this patent is made in two or more parts; the sliding-frame and the glass-frame. These are hinged so that they f ld inwards, and the folding air also serves as a support for flower-pots or ornaments when opened inwards towards the room. Provision is made for fastening the cords to the sliding stiles by threading the ropes down to a slot through which they are drawn, and readily fastened without disturbing the beads.

16,473.—DOOR-CHECKS, &c.: *E. J. Blount.*—This refers to an improvement upon the ordinary pattern of door-closer and door-check in which liquid is employed as an element to resist the free action of the door-closing spring.

19,446.—HANGING DOORS: *H. J. Dwight and Others.*—This relates to hanging doors within door-cases or frames so that they may be opened from either side by pushing or pulling at either outer edge.

291.—CONCRETE FLOORS, &c.: *T. Potter.*—For the purpose of resisting fire, floors are, according to this invention, made in two portions with air space between them, and special provision is made by the shape of them and by upholding them by means of cantilever brackets to prevent their disintegration or destruction by fire.

NEW APPLICATIONS FOR PATENTS.

March 9.—4,958, L. Pickup, Window Fastener.—4,161, J. Kemp, Testing Drains.

March 10.—4,247, J. Adair, Baker's Ovens.—4,257, T. Amario, Supplying disinfectants to the flushing pipes of water-closets, &c.—4,290, W. Kelleher, Show-case and Shop Partition.—4,300, F. Tyers and O. Barnsdale, Plumber's Joints.—4,304, A. Boult, Carving or Cutting Machines.

March 11.—4 313, S Campion, Moulding Apparatus for Filling with Molten Lead Incised Letters or Ornamentation in Marble, Stone, &c.—4,330, H. Bishop & Son, Construction of Streets, Roads, &c.—4,349, R. Fountain, Brick-making Machines.—4,359, D Brown, Wood Screws, &c.—4,364, W. Munns, Shutter-fastening Device.—4 386, C. Inwood, Rotary Ventilating Fans, &c.—4,405, S Chitty and B. Williams, Stay or Fastener for Casements, Skylights, &c.

March 12.—4,424, A. Kershaw, Ventilators. 4,428, J. Kaye, Latches for Doors.—4,435, G. Winship, Rotary Grain and Sewer Cleaner.—4,484, J. Townshend, Folding or Collapsible Seats

March 13 4,509, A. Mitchel-Jones, Rose-bits and similar boring tools.—4,519, W. Clark, Glazing.—4,522, W. Huelser, Brick Presses.—4,536, J. Smith, Ventilation of Soil Pipes, &c.—4,632, T. Edden, Construction of Tongue and Groove Fire-clay Tiles and Bricks.—4,541, W. Gage, Handle for Chisels.—4,572, R. Chantry and W. Peters, Waste Water Preventers.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

6,848, R. & W. Thomason & Sons, Valveless Syphon Flushing Cisterns of Water-closets.—2,313, J. Golding, Self-adjusting Strips for Excluding Draughts from the Bottoms of Doors.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MARCH 16.—By *Reynolds & Eason:* 8, Butler-st., Bottlefields, f. r. 41*l.* 12*s.*, 680*l.*; 12, Tenter-st., f., r. & s., 385*l.*—By *Furber, Price, & Furber:* 2a, 3a, and 4, Russell mews, Kensington, u.t. 70 yrs., g.r. 12*l.*, r. 790*l.*—By *Dolman & Pearce:* 23 and 25, Studley-rd., Clapham, u.t. 47 yrs., g.r. 6*l.*, r. 78*l.*, 650*l.*; 5 and 7, Stray-crescent, Hornsey, f., r.80*l.*, 1,120*l.*; f.g.r. of 6*l.*, with reversion in 74 yrs., 200*l.*—By *Fuller & Fuller:* 2, Battle-ter., Notting-hill, u.t. 70 yrs., g.r. 20*l.* 10*s.*, r. 200*l.*, 925*l.*; 26 and 31, Albert-ter., Islington, u.t. 56 yrs., r. 12*l.*, r. 70*l.*, 560*l.*; 12, Grove-ter., Tottenham, u.t. 75 yrs., g.r. 8*l* 8*s.*, r. 36*l.*, 185*l.*; 14, Grove-ter., u.t. 85 yrs., g.r. 7*l.* 7*s.*, 107*l.*; 24 and 26, Stracey-rd., Forest-gate, f., r. 60*l.* 14*s.*, 605*l.*

March 17.—By *T. Wadel & Co.*: 267, 271, and 273, Amhurst-road, Hackney, u.t. 75 yrs., g.r. 10*l.*, r. 93*l.*, 805*l.*; 275, Amhurst-rd., u.t., 75 yrs., g.r. 1*l.*, r. 33*l.*, 415*l.*; 341, Amhurst-rd., u.t., 75 yrs., g.r. 6*l.*, r. 40*l.*, 485*l.*—By *Montagu Robinson:* 13 and 14, Gough-rd., Stratford, f. r. 36*l.* 8*s.*, 275*l.*; freehold rent charge of 2*l.* a year, Bexley Heath 41*l.*—By *Debenham, Tewson & Co.*, "Mill Hill Lodge," with grounds, Barnes Common, f. 1,700*l.*; Albert-gate, Hyde Pk., f. riding school and stabling, area 16,900 ft. 60,000*l.*; 21, De Beauvoir-sq., Kingsland, u.t. 22 yrs., g.r. 6*l.* 10*s.*, r. 38*l.*, 190*l.*; 85, 87, and 91, Green-lanes, Stoke Newington, u.t. 30 yrs., g.r. 45*l.*, r. 180*l.*, 785*l.*; 30, 31, and 33, Galway-st., St. Luke's, u.t. 9 yrs., g.r. 51*l.*, r. 83*l.*, 70*l.*; 59 and 61, Vicarage-rd., Tottenham, f., r. 46*l.* 16*s.*, 460*l.*; 22 and 24, Gothic-villas, f., r. 39*l.*, 340*l.*; 4 and 5, Laurel-villas, u.t. 78 yrs., g.r. 5*l.*, 95*l.*; 6, 8, and 10, Adelaide-ter., u.t. 87 yrs., g r. 6*l.* 6*s.*, r. 80*l.*, 670*l.*; 2 to 22 (even), Stonebridge-rd., u.t. 88 yrs., g.r. 55*l.*, r. 228*l.* 16*s.*, 810*l.*; 77, 79, and 83, Stonebridge-rd., u.t 88 yrs., g.r. 19*l.* 10*s.*, r. 72*l.* 16*s.*, 250*l.*; 1 and 3, Brunner-rd., Walthamstow, u.t. 89 yrs., g.r. 6*l.*, r. 65*l.* 24*s.*, 115*l.*; 12 to 22 (even), Evelyn-rd., Victoria Docks, u.t. 94 yrs., g.r. 21*l.* 15*s.*, r. 101*l.* 8*s.*, 340*l.*

MARCH 18.—By *W. M. Ogden:* The Residence "Stoneleigh," Worple-rd., Wimbledon, u.t. 84 yrs., g.r. 15*l.*, 1,500*l.*—By *Hobson, Richards, & Co.*: f.g.r. of 10*l.*, Hoxton, with reversion in 1903 to 150*l.* a year, 1,000*l.* By *Norton, Trist, & Gilbert:* f.g.r. of 42*l.*, Tollington-pk., Holloway, with reversion in 73 yrs., 1,100*l.*; f.g.r. of 64*l.*, Moray-rd., with reversion in 73 yrs., 1,440*l.*; twelve plots of freehold land, Clapham-pk., 4,520*l.*—By *Lees & Burchell* (at Redhill): "The Thimble and Nutmeg Grater" beer-house, also cottage and dairy, Warwick-rd., Redhill, u.t. 54 yrs., g.r. 9*l.* 10*s.*; 1,460*l.*; two f. cottages, Church-rd., Reigate, r. 28*l.* 12*s.*, 400*l.*; "Holly Cottage," Redhill Common, f., r. 11*l.* 14*s.*, 215*l.*

MARCH 19.—By *Messrs. Aldridge:* A plot of freehold land, Wivertón-rd., Sydenham, 50*l.*—By *H. J. Bliss & Sons:* A leasehold of the "White Hart" P.H., Walworth-rd., r. 150*l.*, 1,66 *l.*; 40 to 46 (even) Boad-st., Vauxhall, f., r. 75*l.*, 1,*l.*; two freehold cottages, Orpington, Kent, r. 27*l.* 4*s.*, 250*l.*; 36 to 42 (even) Ellesmere-rd., Bethnal-green, u.t. 7 yrs., g.r. 16*l.*, r. 144*l.* 6*s.*, 1,110*l.*; 7, Minto-pl., u.t. 28 yrs., g.r. 3*l.*, r. 28*l.* 12*s.*, 140*l.*; a plot of freehold land, Herbert-rd., Walthamstow, 180*l.* By *Newbon & Co.*: 168, Hichburv New-pk., Highbury, u.t. 59 yrs., g.r. 12*l.* 15*s.*, 167*l.*; 37, Avenell rd., u.t. 85 yrs, g.r. 6*l.* 6*s.*, 280*l.*; 33, Eden-grove, Holloway, u.t. 68 yrs., g.r. 6*l.*, 305*l.*; 13 and 15, Hanley-rd., Hornsey, f., 1,105*l.*; No. 417, Kingsland-rd., u.t. 35 yrs., g r 6*l.*, r. 45*l.*, 270*l.*—By *E. Stinson:* The f. residence, "Haldon," Percy-rd., Hampton, 1,100*l.*; 1 to 10, Cornwall-pl., Lambeth, u.t. 174 yrs., g.r. 28*l.*, r. 170*l.*, 360*l.*; 19, Kilburn Pk.-rd., Kilburn, u.t. 60 yrs., g.r. 6*l.*, 45*l.*; 38 to 44 (even), Naylor-rd., Peckham, u.t. 86 yrs., gr. 19*l.* 12*s.*, r. 81*l.* 16*s.*; 16 to 24 (even), Goldsmith-rd., f., r. 92*l.* 12*s.*, 670*l.*; 22, 24, and 26, Costa-st., u.t. 73 yrs., gr., 12*l.*, r. 78*l.*, 501*l.*; 26, Pecaham Rye, u.t. 10 yrs., g.r. 22*l.*, 195*l.*; 177, Peckham Rye, f., r. 26*l.*, 160*l.*; 2, 3, and 9, Hern villas, u.t. 88 yrs., r. f., r. 8*s.*, 695*l.*; 1 and 3, Lagg-s-cottages, f., 34*l.*; "Stuart House," Stuart-rd., f. r., 31*l.* 2*s.*, 227*l.*; a plot of freehold land, Hall-rd., 70*l.*

MARCH 20. By *W. B. Hallett:* A plot of f. land, Clacton-on-Sea, 135*l.*; By *F. J. Bisley:* 108, Princes-rd., Bermondsey, f., r. 15*l.* 12*s.*, 145*l.*; 389, Southwark Pk.-rd., u.t. 54 yrs., g.r. 5*l.* 5*s.*, 30*l.*; 97, 99, 99, and 100, Princes-rd, u.t. 52 yrs., g.r. 14*l.* 13*s.*, r. 104*l.* 4*s.*, 621*l.*; 38, 40, and 76 to 79, Travers rd., Southgate, u.t. 53 yrs., g.r. 15*l.*, r. 2 Gallatly-rd., New Cross, u.t. 68 yrs., g.r. 5*l.* 5*s.*, r. 35*l.*, 30*l.*; 39 and 32, Gallatly-rd., u.t. 61 yrs., g.r. 10*l.* 10*s.*, r. 60*l.* 5*s.*, 500*l.*; 11 and 13, Gallatly-rd., u.t. 68 yrs., g.r. 10*l.* 10*s.*, r. 63*l.*, 560*l.*; 23, West Sq., Southwark, u.t. 12 yrs., 1.5*l.*, 43*l.*—By *Ball, Norris, & Hadley:* 67 and 69, Sumatra-rd., Hampstead, u.t. 94 yrs., g.r. 16*l.*, r. 56*l.*, 410*l.*; 4, Parkhurst-ter., Southgate, u.t. 86 yrs., g.r. 6*l.* 10*s.*, r. 22*l.* 8*s.*, 125*l.*; two plots of f. land, Claremont-rd., Highgate, 10*l.*—By *R. Reid:* 20, Taviton-st., Gordon-sq., u.t. 60 yrs., g.r. 5*l.*, r. 15*l.*, 1,170*l.*; 57, Gordon-sq., u.t. 32 yrs., g.r. 15*l.*, r. 13*l.*, 1,360*l.*; f.g.r. of 50*l.*, York-rd., Camden Town, u.t. 57 yrs., at a peppercorn, 920*l.*; f.g.r. of 18*l.*, Walworth u.t. 59 yrs., gr. 8*l.*, 250*l.*; 159 and 159a, High-rd., Kilburn, f., r. 110*l.*, 1,600*l.*; 165, High-rd., f., r. 80*l.*, 1,25*l.*; 25, Westbourne Pk-rd., Paddington, u.t. 42 yrs., g.r. 9*l.*, r. 70*l.*, 750*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS

TIMBER.		
Greenheart, B.G.		
	t.l.	6 10 0 / 7 10 0
Teak, E.I.	load	8 10 0 / 14 0 0
Sequoia, U.S.	f.	0 0 2½ / 0 0 3
Ash, Canada	load	2 0 0 / 4 5 0
Birch, do.	do.	2 5 0 / 3 0 0
Elm, do.	do.	3 10 0 / 4 5 0
Elm, Dantzic, &c.	do.	2 0 0 / 3 15 0
Oak, do.	do.	2 10 0 / 3 10 0
Canada	do.	4 17 6 / 6 10 0
Pine, Canada red	do.	2 10 0 / 3 5 0
Do. yellow	do.	2 0 0 / 3 5 0
Lath, Dantzic (fath		5 0 0 / 6 0 0
St. Petersburg		5 0 0 / 7 0 0
Deals, Finland,		
1st & 2nd std.	100	7 0 0 / 10 0 0
3rd & sml.	do.	7 0 0 / 8 0 0
Do. Riga	do.	6 0 0 / 7 10 0
St. Petersburg,		
1st yellow	do.	9 0 0 / 14 0 0
Do. 2nd yellow	do.	8 5 0 / 9 10 0
Do. white	do.	6 10 0 / 10 0 0
Swedish	do.	6 4 0 / 7 5 0
White Sea	do.	8 0 0 / 15 0 0
Canada, 1st qlty	do.	14 0 0 / 21 0 0
Do. do. 2nd	do.	9 10 0 / 13 10 0
Do. do. 3rd &	do.	6 10 0 / 9 0 0
Do. spruce, 1st	do.	8 10 0 / 10 10 0
Do. do. 3rd & 2nd	do.	6 0 0 / 7 10 0
New Brunswick	do.	6 0 0 / 7 0 0
Battens, all sizes	do.	5 10 0 / 15 10 0
Flooring Boards, sq. 1 in. thick		0 10 0 / 0 14 0
Do. 2 in.		0 0 0 / 0 10 6
Other qualities		0 0 10 / 0 7 6
Cedar, Cuba	f.	0 0 4½ / 0 0 5
Honduras, &c.		0 0 4 / 0 0 6
Mahogany, Cuba		0 0 4½ / 0 0 6
St. Domingo		0 0 3½ / 0 0 5
Tobasco, &c.		0 0 3½ / 0 0 5
Mexican, do.		0 0 4½ / 0 0 5½
Honduras, do.		0 0 3 / 0 0 4½
Box, Turkey	t.n.	14 0 0 / 17 0 0
Rose, Rio		10 0 0 / 20 0 0
Ebony		9 0 0 / 18 0 0

TIMBER (*continued*).		
Satin, St. Do-		
mingo	ft.	0 0 10 / 0 1 3
Porto Rico		0 0 9 / 0 1 6
Walnut, Italian		0 0 3½ / 0 0 7
METALS.		
Iron—Bar, Welsh,		
in London	ton	6 5 0 / 6 15 0
Do. do. at Works		
in Wales		5 15 0 / 6 5 0
Do. Staffordshire,		
in London		6 5 0 / 7 0 0
Copper, British,		
cake and ingot		58 0 0 / 57 0 0
Best selected		59 0 0 / 60 0 0
Sheets, strong		68 0 0 / 0 0 0
Chili, bars		52 10 0 / 0 0 0
Yellow Metal	lb.	0 0 6½ / 0 0 6¾
Lead—Pig,		
Spanish	ton	12 11 3 / 12 15 0
English, com.		
brands		12 15 0 / 0 0 0
Sheet, English,		
3 lbs. per sq. ft.		
and upwards		14 5 0 / 0 0 0
Pipe		14 15 0 / 0 0 0
Zinc—English		
sheet	ton	27 3 0 / 0 0 0
Vieille Montagne		27 10 0 / 0 0 0
Tin—Straits		90 0 0 / 0 0 0
Australian		90 15 0 / 0 0 0
English ingots		94 15 0 / 0 0 0
OILS.		
Linseed	ton	22 12 6 / 23 17 6
Cocoanut, Cochin		40 0 0 / 0 0 0
Do. Ceylon		34 0 0 / 35 0 0
Palm, fine		27 0 0 / 0 0 0
Do. second		25 10 0 / 26 0 0
Do. third		25 0 0 / 25 10 0
Rapeseed, refd.		25 15 0 / 0 0 0
Olive		2 17 0 / 34 0 0
Lucca, virgin		0 0 0 / 0 0 0
Do. refined		0 0 0 / 0 0 0
Cod, Seal, pale		0 0 0 / 0 0 0
Archangel		0 0 0 / 0 0 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

CARLISLE.—For the erection of a brick boundary-wall round the Fusehill-street recreation ground for the Corporation of Carlisle. Mr. W. Howard Smith, C.E. City Surveyor, Town-hall, Carlisle:—

J. & W. Baty	£295 0 0	Baty Bros.	£228 15 0
T. Creighton	241 0 0	J. Baty, Carlisle*	226 10 8

* Accepted.

CARLISLE.—For wrought-iron and tubular fence at Fusehill-street recreation ground for the Corporation of Carlisle. Mr. W. Howard Smith, C.E. City Surveyor, Town-hall, Carlisle:—

Peat Bros.	£187 0 0	Shaw	£147 12
T. Tebbutt & Co.	139 10 0	Lee and	135 0
Evans, Pilkington, & Co.	137 0 0	W. G. Hutchinson & Son	128 14
R. Cowper	129 0 0	J. & J. Wright, Carlisle*	127 10

* Accepted.

DUBLIN.—For the erection of Sir Patrick Dun's Church Home, Grand Canal Dublin, from designs of Messrs. Doolin & Upper Mount-street Dublin:—

R. Wall	£2,299 0 0	Hulmes & Co.	£1,984 0 0
W. Harper	2,190 0 0	R. Farquharson	1,905 5 2
P. Dowling	2,178 0 0	J. Jones	1,890 0 0
C. Kingston	2,150 0 0	John Good	1,886 0 0
[illegible]	2,100 0 0	H. [illegible]	
[illegible]	2,000 0 0	Dublin*	1,886 0 0
S. Watson	1,900 0 0		

* Accepted.

FULHAM.—For the erection of a block of dwelling-houses and shops, with workmen's dwellings at the rear, in Ashington and Cristowe roads, Fulham, for the Vestry of Fulham. Mr. W. Price, Architect, Surveyor, and Valuer, 4, Victoria-chambers, Victoria-st., Westminster:—

Names of Tenders.	Ashington-road.				Cristowe-road.			
	Block A.		Block B.		Block C.		Block D.	
	£	s.	£	s.	£	s.	£	s.
[illegible]	1,[illegible]	0	1,[illegible]	0	[illegible]	0	[illegible]	0
[illegible]	[illegible]	0	[

LONDON.—For providing heating apparatus on the low-pressure hot-water system for the portion of the Westminster School which is now in course of erection, and a new boiler, and also for extending the apparatus to the class rooms in the old portion of the school, for the School Board for London. Mr. T. J. Bailey, Architect:—

J. Sinclair, Sons, & Co.	£735	0	0
W. G. Cannell	748	0	0
John Fraser & Son	746	0	0
C. P. Kimell & Co.	649	0	0
Rosser & Russell	695	10	0

* Recommended by the Works Committee for acceptance.

J. W. Wonham, Smith, Grey, & Co.	£772	10	0
Comyn Ching & Co.	919	0	0
Jones & Attwood*	425	0	0

LONDON.—For the erection of a school to provide accommodation for 800 children on the site in Bird-in-Bush-road, and also for the erection of a schoolkeeper's house with a single cookery centre underneath, for the School Board for London. Mr. T. J. Bailey, Architect:—

	Add for white glazed brick facings, &c.	
J. T. Chappell	£19,158 0 0	£1,747 0 0
Treasure & Son	18,895 0 0	900 0 0
Hart Bros.	18,895 0 0	1,414 0 0
J. Longley & Co.	18,415 0 0	979 0 0
Foster & Dickson	18,198 0 0	1,057 0 0
Jesse Dyke & Son	17,651 0 0	1,176 0 0
J. W. Hobbs & Co., Limited	17,362 0 0	884 0 0
Holloway Bros.	17,074 0 0	1,838 0 0
H. Lovatt	17,054 0 0*	728 17 4*

* Recommended by the Works Committee for acceptance.

LONDON.—For removing iron building from the site of the new school in Paddington-road, Clapham Junction, to the site in Bardley-road, Streatham, for the School Board for London. Mr. T. J. Bailey, Architect:—

T. Cruwys	£990 0 0
Dixon Bros., & Co.	146 12 0

* Recommended by the Works Committee for acceptance.

Croggon & Co., Ltd.*	£158 10 0

LONDON.—For alterations, &c., of the "Merlin's Cave," Rosoman-street, E.C., for Mr. Alfred Mayer. Mr. A. Allen, jun., architect, 12, City-road, Finsbury, E.C.

Dearing & Son*	£911 0

* Accepted.

PENRHYNDEUDRAETH.—For the erection of an explosive magazine and lodge with Fence for Mr. James R. Watkin. Messrs. Andrews Roberts, Plans, Festiniog, and Rudland Pritchard, Penmaenbach-pett, North Wales, architects:—

Rd. Wm. Hughes & Sons	£197 0 0
Owen Lewis Williams, Tanner	122 3 0
Isaac Humphreys, Sadler	
Wm. Morris, Mason	
John Parry Jones, Penrhyn Isa-bridge*	118 0 0

* Accepted.

ROSSETT (Denbighshire).—For taking down the present parish church and erecting new one. Messrs. Douglas & Fordham, architects, 9, Abbey-square, Chester. Quantities by the architects:—

A. Beckley	£3,600 0 0
Peter Edwards	4,100 0 0
Hughes & Owen	4,100 0 0
Parker Bros.	£3,975 0 0
Davies Bros.	3,965 0

ROTHWELL.—For supplying and erecting an iron water-tank, supply of water mains, and foundation work, for the Local Board. Mr. L. Starkie, surveyor, Rothwell, Leeds:—

Tank.

E. & H. Hayly	£237 0 0
John Walker	220 0 0
The Stockton Fire Engine Co.	215 0 0
Harrison & Hunnicliff, Wakefield*	195 0 0

4½ Pipes.

The Stavely Iron Company	5 10 0
E. & H. Hayly, Bradford*	5 2 6
John Walker	5 0 0

7½ Foundation Work, per ton.

Chapman Brothers, Rothwell*	85 14 0

* Accepted.

SHAPINSHAY (Orkney).—For erecting church for the United Presbyterian Congregation, Shapinshay, Orkney. Mr. T. S. Pence, architect, Kirkwall:—

W. B. Peace & Son, Kirkwall	£729 4 4

TOTTENHAM.—For the erection of Sunday School Class-room, dwelling house, &c., on Mitchley Road, Tottenham, for the Committee of the Buildings Fund of St. Mary's, Tottenham. Mr. J. W. Couchman, architect, Tottenham.

	A.	B.	C
T. Bentley	£1,541	£1,568	£1,541
T. Tyerman	1,295	1,409	1,275
A. Porter	1,189	1,240	1 182
H. Knight & Son	1,161	1,159	1 124*

A Portland cement dressings at back and e. B Bath stone dressings C Bath stone dressings and oak fence.

* Accepted.

TOTTENHAM.—For the erection of house in Warty-road, Tottenham. Mr. E. C. Hollis, architect, 90, Great Russell-street, E.C.:—

D. G. Horlock (accepted)	£1,924

TUNBRIDGE WELLS (Kent).—For the erection of new end pavilion block at the Union Workhouse, Tunbridge Wells, for the Guardians of the Tunbridge Union. Mr. W. Ockley, architect, 36, Mount Pleasant, Tunbridge Wells. Quantities by Mr. Thos. Lucas, of Tunbridge Wells:—

C. J. Gallard	£3,767 0 0
F. Stevens	3,748 10 0
E. G. Saxby	3,731 17 0
Herbert Stiff	3,550 0 0
Davis & Leaney	3,384 0 0
Richd. Avard	3,318 0 0
G. & F. Penn	£3,317 17 0
G. Denne & Son	3,290 0 0
G. F. Wallis & Son	3,234 0 0
G. J. Jones, Tonbridge (accepted)	3,142 1 10
E. Thurbon	3,099 0 0

WATFORD.—For new cricket pavilion, for the West Herts Cricket and Football Club Committee. Messrs. Ayres & Ardron, architects, 52, High-street, Watford:—

Judge	£767
Sell	867
Eames	887
Andrews	876
Clifford & Gough	849
Brightman	835
Dove	£747
Turner, Limited	734
Wiggs	728
Waterman	709
Allen	727

New Premises, Hexham.—A list of tenders for new premises at Hexham has been received by us, but neither it nor the circular which contained it bears any indication of the sender's name. We cannot insert lists of tenders or other items of news unless we know who sends them.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (or 4s. 9d. per quarter), can ensure receiving "The Builder" by *Friday morning's post.*

TO CORRESPONDENTS.

C. H. T. (should have sent amounts).—H. B. (ditto).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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Disposal of Sewage from Isolated Buildings.

I.

TIME was,—and that not long ago,—when an architect asked for nothing better than a brook or river into which to pour the sewage of a house, or, if a stream were not available, was quite content to build a cesspool and open the drains into that. But so much has been done in recent years towards the healthy disposal of the sewage of large and small towns and villages, and so much experience has been gained, that there is now little excuse for ignorance on the subject. It is not likely, either, that towns which have been at considerable expense in properly treating their own sewage, will long continue to permit the river flowing through their midst to be laden with the filth of villages and houses nearer its source. It is satisfactory to know that many rivers are less foul than they were ten or twenty years ago, but it is to be hoped that in the coming days of Watershed Boards, keenly alive to all kinds of river pollution, it will be utterly impossible for any one to pass crude sewage into a stream with impunity.

The problem here considered is,—to dispose of the sewage of a large country building in some way other than that of pouring it into a public sewer.

The simple method of passing the crude sewage into the nearest stream is not worthy of consideration; for, if one building were permitted to do this, there would be no valid reason why a hundred others should not do the same, and although a clear running stream of moderate size would of itself be sufficient to purify by oxygenation the sewage of one or two mansions, yet it would not purify that arising from many mansions, but would itself become foul. The total quantity of crude sewage poured into a stream ought not to exceed 5 per cent. of the amount of water in the stream.

The other simple expedient,—a cesspool,—is also, or ought to be, obsolete. Cesspools have long been condemned in towns as dangerous to health, but in many country places they are still permitted to exist, and, doubtless, to contaminate, by secret channels and by simple percolation, the water supplies of the district. They have had their day; it is high time that they ceased to be. It is not damp mineral subsoil that will purify sewage, but chiefly the upper soil in which plants live, and to which sun and air can give their vivifying powers.

The remaining methods of sewage-disposal may be divided broadly into two classes,—the *first* including those which require the addition of certain materials to the sewage, and this may be called *the chemical treatment*; and the *second*, which we will call *the natural treatment*, consisting of those which depend entirely upon the natural properties of air, earth, and plants.

The number of processes comprised in the first class is legion. Some were tried long before the opening of this century, and during the century many wonderful discoveries have been made, which were to have had instantaneous effect in purifying sewage and freeing us from all smells and nuisances resulting therefrom, for ever and ever; nay, more, we have been over and over again induced to believe that sewage treatment by this or that patent process would bring reward to towns not only in health, but also in actual hard cash. Patentees have discovered this if nothing else, that the problem is not as easy of solution as they thought. Of the hundred or two methods which have been successively advocated, probably not more than a score are in actual use to-day, and of this score perhaps the really useful ones could be counted on the fingers of one hand. Blood, charcoal, tar, dried seaweed, lime, iron, herring-brine, carbolic acid, bleaching powder, and a whole laboratory of other substances, some with brand new names, have been added to sewage to purify it, but most of them have achieved no more than a temporary success. They have proved either too costly or of doubtful advantage.

The places in which chemical treatment may be adopted were specified by the Royal Commission on Metropolitan Sewage Discharge (1884) to be those "where the quantity of sewage is not very great, where the sewage can be promptly treated, and where there is a running stream into which the effluent can be discharged, in a proportion not exceeding 5 per cent. of the supply of fresh water."

In nearly all chemical processes, the "chemical" or precipitant is added to the sewage by means of a more or less complex arrangement, frequently self-acting, and the two are thoroughly mixed by mechanical agitation, or by passing over "salmon-ladders" or between baffling-plates. The compound is run into a tank, and allowed to remain there undisturbed for two or three hours, during which time the heavy suspended particles, such as road-detritus, settle of themselves, and the chemical is also hard at work decomposing the sewage, precipitant and precipitates forming part of the general "sludge" at the bottom of the tank. The liquid is then drawn off (by means of a floating arm, so as not to disturb the sludge), and is passed over land or through prepared filters. Sometimes the chemically-treated sewage is allowed to flow continuously, but gently, through the tanks without any period of absolute quiescence; the method previously described is, however, preferable.

It is evident that some further treatment is required before the effluent from precipitation-tanks can be considered pure enough to be discharged into a stream.

In the *natural treatment* of sewage there are two principal methods, one known as *Surface* or *Broad Irrigation*, and the other as *Intermittent Downward Filtration*.

Mr. Denton's definitions of the two methods are worth quoting:—Intermittent downward filtration is "the concentration of sewage *at regulated intervals* on as few acres of land as will absorb and cleanse it without preventing the production of vegetation." "Surface-Irrigation means the distribution of sewage on as many acres as it will wet without supersaturation, having in view a maximum plant growth." Or we may say that the former aims at the purification of sewage by the natural filtering powers of the earth assisted by vegetation, and that the latter tries to effect the same object by the natural absorptive powers of vegetation, assisted by the

earth; in both, sun and air play an important part.

The fact is that so many chemical processes have proved to be failures, that inspectors and engineers generally are now chary of adopting such a method, though its efficiency be declared by any number of chemists' analyses, and so forth. Precipitation by chemicals is admitted to be beneficial, but the effluent must be further purified. This points to a combination of the two modes of treatment,—*chemical* and *natural*.

For intermittent filtration, the ground is deeply under-drained, and the surface formed into a series of closely-set ridges and furrows. Into the latter the sewage is turned; part of it evaporates, part is absorbed by plants, and the remainder, purified in its passage, penetrates down to the drains, and is carried away by them to the nearest river or other available outlet. On the ridges,—out of actual contact with the sewage,—vegetables, roots, and grasses of various kinds are planted, and feed upon the sewage which spreads about their rootlets. It is, however, absolutely necessary that the filtration be intermittent, or the ground may become so sewage-soaked that the liquid pouring from the under-drains may be little or no purer than the sewage itself. At least two series of furrows must therefore be formed, into which the sewage can be turned alternately, but it is found better in practice to have three or four series in order that each one, after use, may be well dried and aërated before it is again called into requisition. The length of time during which one series of furrows will continue to purify the sewage varies according to the nature of the ground, and also according to the quantity and quality of the sewage. A clayey or peaty soil may become sodden in a few days; a light sandy or loamy soil may continue useful for several weeks. The sludge which remains in the furrows after the liquid has passed away should be dug into the ridges.

For broad irrigation, the ground may or may not require under-draining. If it be naturally somewhat wet and heavy, under-drains will be a necessity, as they are in many cases even where no extraordinary amount of moisture is poured upon them; but they need not be as deep or as close to one another as in ground laid out for intermittent filtration. The sewage is turned into small furrows, which are cut about ten or fifteen yards apart, and between these the moisture spreads laterally among the roots of the herbage or other produce, which is growing upon the farm; the effluent passes off by a carrier running along the bottom of the irrigated plots. This method of sewage disposal is a great improvement to light, sandy soils, as at Worksop and at Abingdon, where the sewage-farm is let at an annual rent per acre almost double that of neighbouring farms.

A third method of land treatment, used perhaps oftener in America than in England, is that known as *Sub-Irrigation*. The method has its advocates, but it is not equal to either of the other systems of land treatment, and a brief description will therefore be sufficient. Unsocketed drain-pipes, 3 in. or 4 in. in diameter, are laid (sometimes in earthenware channels or half-pipes) at a depth of 10 in. or 12 in. below the surface of the land; the sewage, after being screened, is turned into these pipes, and spreads from them into the surrounding soil, and is, in great part, absorbed by the vegetation upon the surface. In some cases under-drains, 4 ft. or 5 ft. deep, are required to prevent the land becoming swampy.

Advantages and disadvantages are to be found in nearly all the methods of treatment, and a statement of the more important of these will lead to an intelligent consideration of the subject. Any process, of course, of which the effluent is not within the limit of impurity fixed by the Rivers Pollution Commissioners in 1870 is at once put out of court.

The chief advantages claimed on behalf of chemical treatment are these:—The sewage is acted upon rapidly, and either before or immediatly after its arrival at the outfall, before putrefactive and unhealthy organisms have had time to develop and propagate; the precipitant deodorises, and, at any rate partially, disinfects the sewage; and the process of purification is not dependent on a great number of variable circumstances, but is approximately regular. The disadvantages most commonly alleged against chemical processes are the following:—Lime, often used as a precipitant, gives rise to many nauseous smells, and results in the release of an impure effluent; the deodorisation and disinfection are at best only partial; the sludge is often difficult to get rid of, having little or no manurial value; and during a severe rain-storm, a great part of the sewage passes into the river without any treatment at all.

Some of the reasons advanced for and against land-treatment may be gathered from the preceding paragraph. It is said that disease-germs are spread through the atmosphere by passing crude sewage over land; that man and beast partaking of the produce of sewage farms may become tainted with some infectious disease, which is conveyed by sewage adhering to the vegetation; that the process of purification is dependent on many variable circumstances (such as frost, sodden condition of the ground after heavy rain, state of the crop in summer and autumn, absence of vegetation in winter, and so on), and therefore a pure effluent cannot be ensured; that the ground becomes sewage-sick, or choked with filthy slime, fit haunt of myriads of sewage-worms; that the surrounding atmosphere is laden with intolerable smells; that the quantity of land required for broad irrigation entails enormous initial expenditure, and, in populous valleys, a continuous expense in pumping, which more than counterbalance the profit made by farming the land. On the contrary, it is declared that the purification of the sewage, if slow, is sure in works properly designed and managed; that there is no danger of conveying disease by the vegetation, or of choking the ground, due care of course being observed; that the land purchased can at any time be sold for as much as or perhaps more than it cost, whereas money spent in "works" is, if the works be abandoned, entirely lost.

There can, we think, now be no reasonable doubt that precipitation is beneficial, that deodorisation and disinfection are highly desirable, and therefore that simple land-treatment, while sufficient under many circumstances, and with sewage not too nasty, is not a perfect solution of the problem of sewage-disposal. It is equally true that no process of chemical precipitation has yet been *proved* sufficient of itself to produce in all cases an effluent pure within the meaning of the Rivers Pollution Act. A combination of the two methods is, therefore, often necessary,—either precipitation and filtration, or precipitation and irrigation, the preciptant having the power of deodorising and disinfecting the sewage to some considerable extent. As we have said before, the disinfection of the sewage from hospitals for infectious diseases is an absolute necessity, and any scheme for disposing of the sewage of a mansion, school, or other institution within a short distance of the building would be lacking if deodorisation were not effected.

Before we describe any of the processes in detail, it will be best to ascertain the quantity of sewage which may be expected to arise from a given building, and at the outset it must be decided whether the rain-water shall all be admitted to the sewage-drains or shall be partially or wholly excluded. The subsoil water also must be considered.

In broad-irrigation works on light soil, it does not matter very much whether the rainfall be excluded or not, provided the area of land be large enough. Town-sewage frequently cannot be utilised for irrigation, unless it be raised by pumping, as the available farm-land lies higher than the sewer outfall. In such cases, the admission of rain-water to the drains entails increased expenditure in pumping, and either necessitates the construction of large tanks, in which storm-water can be stored until the pumps are able to deal with it, or permits a large volume of mixed sewage and rain to pass untreated into the river. These are the chief arguments uttered against the single system of drainage in conjunction with irrigation, but they are not of much force in our present inquiry, as broad irrigation will seldom be adopted for an isolated building if pumping be thereby necessitated. Certainly irrigation has, in more than one instance, been employed under such circumstances, the pumps being driven by turbine or gas-engine, but nowadays there are chemical processes which would achieve a satisfactory result more economically.

There is another objection, however, which cannot be overlooked—to wit, an excess of water will prove injurious to the crops in certain stages of their growth. For this reason, unless the available ground be of considerable extent, so that the excess can be widely spread, it is wise to exclude rain-water as much as possible. Architects will do well, in any case, to exclude that portion of it which, falling on roads, paths, and yards, will carry with it much sand or dust, as these ingredients may do more harm than good to the land.

But if intermittent filtration or any chemical treatment be adopted, the whole of the rainfall ought, where practicable, to be excluded from the sewage-drains, and, in any case, only so much of it should be admitted as is absolutely necessary to flush them. The portion so included should be gathered from the cleanest and least friable surface available, which is the roof. The presence of a large quantity of rain-water in the sewage increases the cost and difficulty of treatment at the outfall, and sand increases the amount of sludge, and lowers its quality.

The rain-water should never be admitted in driblets, but should be collected at the head of each system of drains where necessary, and discharged rapidly by means of an automatic syphon. Waste-water from baths and lavatories, which is frequently almost pure, should be utilised for flushing in the same way, and if these fittings are at or near the head of a system of drains, there will be no need to admit any rain-water at all into that system.

It is scarcely our province in this article to speak of the drains themselves, but one or two points, perhaps, may be mentioned with advantage, as drains properly made can be kept clean far more easily and with a smaller quantity of water than ill-made ones. Let the drains have as great a fall (in reason) as possible; gradients varying from 1 in 30 to 1 in 50 give good results with 6-in. pipes; but where such gradients cannot be obtained, get the best possible, even at the expense of a considerable amount of digging. The drains should be laid in straight lines wherever practicable, and all branch drains should have a drop of 3 in. or more into the main. Care should be taken to prevent the settlement of drains crossing soft places. The drains should be as small as possible, and not, as used to be the custom, as large as possible; a 6-in. drain is amply large enough to take the sewage from almost any mansion. Other points might be mentioned, but these are enough for our present purpose. The aim of the architect ought to be to secure drains of such gradients and so well laid that the sewage itself will keep them clean; for all additional water added for cleansing purposes, whether it be rain-water, subsoil-water, or actual service-water, increases the difficulty of treatment at the outfall.

With reference to the subsoil-water, we may say that it is best excluded from the sewage-drains, and connected with the drains which convey the superfluous rain-water from the roofs, and the surface-water from the roads and yards. The whole of the drains, from the building to the outfall, ought to be well jointed in cement, in order to exclude the subsoil-water throughout their extent, and also to keep out the sand and other solid matter, which in light soils would

be conveyed into the drains by the subsoil-water.

We will suppose that the sewage of a mansion has to be dealt with, and that there are two sets of drains discharging into a main drain, which conveys the sewage to the out-fall. At the head of one system of drains, one or more lavatories and baths occur, and the waste-water from these is stored and automatically discharged for flushing purposes. At the head of the other system, which includes the sewage from the stables, it is considered necessary, on account of the flat gradients, to gather rain-water for that object. The sewage from an entrance-lodge is conveyed into the drain from the mansion, and, assuming the branch-drain to be short and of good gradient, no additional rain-water requires to be admitted.

The drain from the stables, if well made, will be sufficiently cleansed by a flushing-tank discharging forty gallons at intervals of, on the average, two days, and from this we can easily calculate the horizontal area which will supply the quantity of rain-water required.

The amount of rainfall varies very much in different years and in different localities; in nearly every district a record is kept by some person or other, and this should be studied before designing sewage-works for that neighbourhood. For purposes of calculation we will take the mean English depth, which is 30 in. per annum. At this rate an area of about 52 square yards will receive sufficient rain to fill the flushing-tank on the average every alternate day. A portion of the rain will, however, be absorbed or evaporated, and will, therefore, never reach the drains; to allow for this we must increase our gathering surface by one-half, *i.e.*, we must make it about 78 square yards. During a very dry season the tank might be filled occasionally from the water-supply of the house.

But the rain, which is so good a friend in cleaning our drains, on occasion behaves somewhat treacherously, and pours down in such a flood as to disarrange our outfall works, if great precautions have not been taken against its impetuosity. The mean daily rainfall is about one-tenth or one-twelfth of an inch, but sometimes a fall of 1 in. takes place, and it is recorded by Mr. W. H. Watson that a phenomenal fall of 2·33 in. occurred on November 30 last year at Braystones, in Cumberland. At one observatory known to me, the greatest rainfalls in a day recorded for the last four years are ·91 in 1887, 2·19 in 1888, ·87 in 1889, and ·98 in 1890, while the greatest rainfalls in a week were for the same years 1·67, 3·14, 2·30, and 1·84 inches respectively. From these figures it will be seen that a rainfall of more than 1 in. in a day is not of very frequent occurrence.

In the mansion under consideration, an inch of rainfall on the gathering surface of 78 square yards will yield (neglecting absorption and evaporation) 365 gallons, and for a considerable portion of this quantity provision must be made at the outfall.

The quantity of sewage which may be expected to arise from the building must next be considered. In the case of existing buildings, the actual volume of sewage can be ascertained without much difficulty by gauging with a large cask, but in designing outfall works for new buildings an approximate estimate only can be made. Many causes combine to render it difficult to ascertain the quantity with any exactitude. The water-supply is an all-important factor; it may be very plentiful, or strictly limited. The number of occupants in proportion to the size of the building, the habits and condition of the occupants, the number of horses and carriages, and other causes also require to be taken into consideration. In fact, each building will differ in the quantity of its sewage from every other; a school containing 100 or 200 boarders will produce less sewage per occupant than a hospital, and this, probably, less than a mansion.

The daily quantity of sewage from towns is usually about 30 gallons for each inhabitant, but sometimes is only 20 gallons, and sometimes reaches even 40 gallons,—exclusive of rainfall. It must be remembered, however, that a great part of the sewage of towns consists of waste-water and liquid refuse from manufactories, and also of subsoil water. But it must also be remembered that the occupants of a mansion will use much more water than the same number of cottagers, and these latter form the greater part of the population of many of our towns. We shall probably not be far wrong in saying that the sewage arising from an ordinary country-house will be about 25 gallons or 30 gallons for each occupant daily. The total quantity must of course be calculated on the basis of the greatest number of persons which the building is designed to accommodate.

One mansion, the sewage of which is now being treated by a chemical process, has twelve occupants, and the daily flow of sewage is about 500 gallons; in this case, all rainwater is excluded. The sewage arising from the barracks at Chichester is usually about 15 gallons daily for each inhabitant, exclusive of rain and subsoil-water, but in the dry summer of 1887 the quantity dwindled to less than 10 gallons.

Assuming the mansion under consideration, together with its entrance-lodge, to provide accommodation for eighteen persons, we may estimate the total daily sewage to be about 500 gallons. The quantity of rain falling on the gathering surface of 78 square yards will, as previously stated, be about 365 gallons. From these data, we can calculate the size of tanks required, and also the quantity of ground for land treatment.

Another—and, perhaps, better—way of ascertaining approximately the probable quantity of sewage is to calculate the amount of water required for the occupants of the mansion, and for the horses and carriages. According to Hurst, 15 gallons should be provided daily for each man, woman, and child; 16 for each horse; 16 for each four-wheeled carriage, and 9 for each two-wheeler. A mansion and lodge, therefore, in which eighteen persons reside, and whose stables contain five horses, two four-wheeled carriages, and two two-wheelers, will require a minimum water supply of 400 gallons daily. Evidently the amount of sewage previously stated,—500 gallons,—may be considered not far from the mark.

We must now decide upon the treatment to be adopted. This decision will depend largely upon the extent of the ground appertaining to the building, upon the nature of the ground, and lastly upon the quantity and character of the sewage.

It is probable that the owner would object to any scheme of disposal, in which the sewage was openly exhibited over a somewhat extended area within a few yards of his mansion. The sewage might not create a nuisance, from a sanitary inspector's point of view; there might not be any appreciable smell arising from it, or any danger to be feared to the health of the occupants of the mansion; but the mere fact of seeing it might be a sufficient objection in the eyes of the owner. Cesspools are out of sight, and therefore out of mind, and this is probably one reason why they have been so generally used.

Most people have quite a wrong notion of sewage-works. It is thought that they *must* be the filthiest and most evil-smelling places the sun ever shines on, and it may be that the architect will have hard labour to disabuse his client of such a notion. The best way to do it will be to take him to see one or two good examples,—be sure they are good examples,—and very likely the client will return surprised from the visit. He will learn that a greater nuisance is often caused by the agricultural operations of leading, stacking, and spreading farm-yard manure than by any well-conceived and well-managed scheme of sewage-disposal.

There is really not much danger of any smell being perceptible at a distance of 100 yards from either irrigation or filtration works which have been well carried out and are well cared for, but it is not advisable to dispose of sewage in either of these ways within 200 yards of the building; and then it will be a wise precaution to screen the works by a group of trees, so that they may be hidden from view, and also so that the danger of smell being carried by the wind to the house may be minimised. Mr. E. F. Bailey-Denton, in his "Handbook of House Sanitation" (1882), says: "In order to avoid even the idea of nuisance, the land selected for sewage-treatment should be situated at a distance of two furlongs or more from the dwelling, though in the cases of certain public asylums and hospitals much less than that distance has been found by experience to be quite sufficient." For some reasons, of course, the greater the distance is, the better, but certainly we think that, if it be made a condition that land-treatment shall not be adopted within a quarter of a mile of a house, it will very seldom be adopted at all. The cost of such a length of drain will be considerable, and will often more than counterbalance the additional cost of chemical out-fall works; and, besides this, there are many buildings which have not such an extent of ground around them. The irrigation area laid out by Mr. Rogers Field, in connection with the Charterhouse Schools at Godalming, is about 250 yards from the building, and in other instances irrigation has been adopted within half this distance of the mansion whose sewage is under treatment.

Cases are said to have occurred in which dysentery and other diseases have been produced by emanations from sewage-farms, even in persons living 300 yards away from the irrigated land; the neighbourhood of the Croydon sewage-farm has suffered largely from typhoid fever, caused, as some say, by the farm, or, according to others, by a polluted water-supply. There are, however, many instances of land-treatment, which have created neither nuisance nor disease, as far as can be ascertained. Thus, the manager of the Bedford Sewage Farm recently reported that neither epidemic disease, sickness, injury, nor annoyance had been experienced by the eight persons living on the farm, or the twenty persons working on it, although some of these were children. Other instances could be cited.

A distance of 200 yards from the building ought, therefore, to prove sufficient for the land-treatment of a moderate quantity of not too nasty sewage, but if the grounds of the building be of so limited an extent that the sewage must be treated within this distance, a chemical treatment ought to be adopted. In the case of such buildings as the last, it is sometimes possible to make arrangements with the owner of an adjoining farm, that the sewage shall be turned upon his land and utilised there for broad irrigation.

The area of the ground required for the actual disposal of the sewage should be considered in this connexion. In designing sewage-disposal works for towns, it is usually calculated that one acre of ground laid out for intermittent filtration, will, according to its suitability, purify the sewage of 250 to 1,000 persons, and that the same area, laid out for broad irrigation, will be required for 50 to 100 persons; that is to say, the sewage of our mansion and lodge would require for its purification by the former method, an area varying from about three to twelve perches, and by the latter, from about twenty-nine to fifty-eight perches. It is extremely bad policy to prepare and use too little ground; the higher figures in each case had therefore better be taken, if the ground be only moderately suitable, in order that due intermittency of action can be obtained not only for filtration but also for irrigation.

The nature of the ground is, we said, another point to be considered in selecting a mode of treatment. A heavy clay is quite unsuitable, without special preparation, for sewage disposal; its further power of absorption is too small, it resists the aëration which is so necessary a part of the purifying process, and, in addition, frequently cracks, and thereby permits the sewage to enter the underdrains with scarcely the least purifica-

tion. A peaty soil has also only a limited power of absorption, but, if well drained, is an excellent purifier. For another reason, namely, lack of retentive power, coarse gravels are to be avoided.

Attempts have been made to render even stiff clay useful for filtration purposes, by repeated ploughing and mixing with fine ashes, but such prepared ground is of doubtful efficiency. It must always be remembered that it is the soil in which plants will thrive to which we must look chiefly for purifying power, and it will be better and, in the end, cheaper to adopt a good chemical process, rather than attempt to purify sewage by passing it over land quite unsuited to the purpose. The sewage-farm at Featherstone, near Leeds, proved a nuisance, and, after examining it in 1888, Mr. Paterson, C.E., of Bradford, reported "that the twenty-five acres of land now leased to the Board for sewage-irrigation by gravitation are useless, being 4 ft. or 5 ft. of strong and intractable clay, with no soil worthy of the name."

The best soil for both irrigation and filtration is, said Mr. J. Bailey-Denton in 1880, "a sandy loam, with a small proportion of gritty gravel to quicken percolation." Any soil naturally fertile is suitable, and there is no reason why the kitchen garden of the mansion should not be arranged in ridges and furrows to take the sewage by intermittent filtration; or, to put it another way, the sewage-disposal works may form the kitchen garden of the house; great care must be taken, however, that the sewage, even in the severest storms, does not flood the vegetation.

The third point to be considered is the quantity and character of the sewage. A small quantity of sewage (say from a villa or small mansion) can be best and most economically utilised by broad irrigation, if there be sufficient and suitable ground far enough removed from the house. Greater volumes may be disposed of in the same way, but at a greater distance. If the quantity of sewage be too great to be properly treated on the area of land available, intermittent filtration may be adopted; if too great for this, chemical treatment is necessary.

The sewage from hospitals, more especially those for infectious diseases, must be chemically treated either before or immediately after reaching the outfall, so that it may be thoroughly deodorised and disinfected at once; the effluent may then be passed through filters or over land without danger. The sewage can be further disinfected, and used for manure.

To sum up,—a process of deodorisation and precipitation by chemicals is necessary (1) where *sufficient* land is not available for natural treatment, (2) where *suitable* land for natural treatment cannot be obtained, and (3) where the sewage requires to be quickly disinfected because of the disease-germs which it contains. In other cases, one of the natural processes (or the two in combination) will be found sufficient, and at the same time simpler, and less costly to maintain; the difference in cost, however, will be a mere trifle, and a chemical process is not so difficult to carry on but that an ordinary farm-labourer can easily learn to do the work. In fine, we may say that, if the whole or a very large part of the rainfall be excluded, a good chemical process is suitable for any building and under any conditions, while land-treatment cannot without danger be universally adopted.*

Reredos, St. Matthias' Church, Plymouth.—The new reredos presented by an anonymous donor to St. Matthias Church, Plymouth, was dedicated on the 23th ult. The reredos, made entirely of oak, was executed by Mr. Harry Hems, of Exeter. The design was prepared by Mr. George H. Fellowes Prynne, of London.

People's Palace, East London.—The distribution of prizes awarded by the Worshipful Company of Plumbers to the students of the People's Palace Technical Schools Plumbing Classes will be made by Mr. W. H. Bishop, Master of the Plumbers' Company, on Monday next, April 6, at 8.30, when Sir John Henry Johnson, Master of the Drapers' Company, will preside.

* To be concluded in our next.

A CRITICISM OF RAILWAY LEGISLATION.*

THAT this somewhat prosaic subject is capable of being handled in a manner at once interesting and instructive is proved by the volume before us. Indeed, no one who has read "The Railways of England" will hesitate to follow Mr. Acworth again upon his favourite subject, even though in the present work he deals with but one phase of it,—the burning question of rates and charges. We are at the outset reminded of the fact that there has never been anything like the amount of public interest taken in railway economy here as in Continental countries,—a consequence of the political effects of State ownership, which forces the question upon legislators and their constituents, as well as those more directly interested. The bulk of our railway literature has appeared during the last few years, and we can still point to but very few works of reference upon this subject. Indeed, we can call to mind only one,—that written by the late Mr. Grierson, of the Great Western, by the side of which the present volume will take its place,—which treats of railway rates from a railway point of view. Mr. Grierson wrote just after the failure of Mr. Mundella's Railway Bill, while Mr. Acworth's work opportunely makes its appearance at a time when the Act of 1888 is just entering upon one of its most important stages.

The author has arrived at the same conclusion as Lord Stalbridge as to the probable effect of the Board of Trade Provisional Orders, and considers that they will be so disastrous to the companies as to justify them in declining to extend their operations any further. He contends that "on mere grounds of expediency it is not only not in the interests of the railway companies, but also not in the interests of the railway customers, whether they call themselves traders, or whether they be merely members of the consuming public, that the proposed Provisional Orders of the Board of Trade shall be sanctioned." Admiration is expressed for the patience and ability displayed by Lord Balfour and Mr. Courtenay Boyle in the performance of their arduous task, but it is considered that they were placed in a most unjust and unreasonable position by the Act of 1888. "They were compelled to act at their own discretion, unguided by precedent, and unfettered by instructions," and the result, from a railway point of view, is regarded as very unsatisfactory. The most hopeless feature of the case, as presented by Mr. Acworth, is that, with a few exceptions, nobody will feel the benefit of the compulsory reductions in their carriage accounts which the new schedules will effect—"it will be frittered away in driblets of a few pence here, and a few shillings there."

The arguments leading up to these dismal conclusions are illustrated by amusing comparisons and queer similes, which render the book interesting to the ordinary reader, as well as to those more directly concerned; while the points are, perhaps, forced home more surely by these means than they would have been by the use of columns of imposing and unassailable figures. We may quote an example:—"Here is an instance of rate reduction based, not on practical considerations, but on abstract theory. The Great Northern rate for musical instruments from London to Knebworth is 25s. The Board of Trade report proposes to reduce it to 24s. 3d. Now, it is tolerably safe to say that if Lord Lytton wished to buy a new grand pianoforte, he would not be deterred by the fact that he would have to pay 12s. 6d. for carriage. Nor, if he found the charge brought down to 12s. 1½d., is it likely that the unexpected economy would induce him forthwith to purchase a second. In a word, a pettifogging alteration such as this,—and this is only a type of hundreds and thousands,—simply means to the railway a dead loss, with a prospect of recoupment from increase of traffic, and to the customer a gain so infinitesimal that nine hundred and ninety-nine times out of a thousand he will be utterly unconscious of it."

English railway rates, Mr. Acworth maintains, must remain comparatively high, for reasons most of which had been already urged by Mr. Grierson. But our author gives special prominence to the enormous expense incurred by our railways for speed and safety as compared with other countries. As to the latter point, he remarks upon the fact that English railways, with their crowded lines, and in a climate in which for months in the year dense fogs are of almost weekly occurrence, carry on their traffic at one-third the risk, whether for passengers or employés, which is incurred in America. The way in which American citizens have to risk their lives and limbs at railway crossings and on unsafe tracks is certainly astonishing to English visitors; but we pay a heavy price for the protection we enjoy. Mr. Acworth says, "The cost of establishing and maintaining the block system alone would go far towards furnishing the entire 'maintenance' expenditure of an American railway. If we added the money spent on ballast which shall not subside, and bridges which shall not break down under an advancing train, it would more than do so. Not that the English public is contented even now, but it must understand that any excess cost incurred in the further protection of its skin must come in the long run out of its pocket."

The references to American railways are numerous and instructive, and in addition to quotations from eminent American authorities many observations are introduced suggested by the writer's own experiences on the other side of the Atlantic. Mr. Jefferds,—for we presume that he is the gentleman referred to on p. 238,—is charged with ridiculous exaggeration in respect to the saving in working expenses which he alleges would follow the introduction of his favourite bogie truck; some of his theories being pulled to pieces in a most amusing, and, at the same time, convincing manner. Professor Hunter is also freely criticised, as is the Report presented to the Lancashire and Cheshire Conference; the book being apparently directed largely against this Report, and the Professor's work on the Railway and Canal Traffic Act,—much in the same way as Mr. Grierson's book was a reply to Sir B. Samuelson's pamphlet comparing English and foreign lines.

We are not at all surprised that Mr. Acworth has pilloried the words of the Berwick gentleman who told the Board of Trade that "what we want is to have our fish carried at half present rates. We don't care a —— whether it pays the railways or not. Railways ought to be made to carry for the good of the country, or they should be taken over by the Government. This is what our traders want and mean to try and get." This is outspoken, unreasonable selfishness, and we are quite sure that such sentiments are not entertained as extensively as was implied by the speaker; but Mr. Acworth asserts elsewhere that we are, in this matter, selfish as a nation, and that the outcry against special import rates is a proof that "by nature all men are protectionists at heart." This is his way of putting it. He alludes, in the first place, to the fact that the Parliamentary Committee of 1882 justified a low rate for fish from Wick. Sir Thomas Farrer once stated on this point that, being accustomed to consider the interests of the consumer very largely, he would certainly encourage the railway company in bringing Shetland fish to the London market, even though the effect of it were to lower the price of the Grimsby fish. Now it is a matter of history that a low through rate for hops from Boulogne, which had been granted under precisely similar conditions, had to be withdrawn in consequence of public agitation, "the attempt of the company to earn an honest halfpenny,

* "The Railways and the Traders: a Sketch of the Railway Rates Question in Theory and Practice." By W. M. Acworth, M.A. London: John Murray. 1891.

a penny being absolutely unattainable under the circumstances—being received with a perfect storm of indignation. Can the outcry be explained," proceeds our author, "except as an instance of the natural and corrupt love of Protection implanted in the human breast? And against such a reappearance of the old Adam ought not the Cobden Club to have entered its solemn protest?" Regarding the foreign fruit traffic which, it will be remembered, the railways had to lose in a similar manner, it is observed that "the German cherries which the Dutch boats brought over from Flushing to Queenborough, and which formerly Chatham and Dover trains brought up from that point, now come all the way by water. The barge owners on the Medway and Thames gained, it may be presumed, the profit which the Chatham and Dover lost; the London doctors, too, perhaps gained something, as the cherries mostly arrived somewhat the worse for their journey. But where the advantage came in, either to the London consumer or to the rival Kent producer, is by no means so apparent."

We notice a slight error at p. 28, where the writer, remarking that "to load a ton of tea is one thing, and to load a ton of furniture is quite another," adds, "tea and furniture stand side by side in the fifth or highest class of the classification." As a matter of fact, tea is in the third class, and has never been classified with furniture,—unless we go back to the curious jumble which defines the highest class under the old Acts of Parliament, viz., "Fish, feathers, canes, cochineal, household furniture, hats, shoes, toys, and all other matters, articles, and things."*

Mr. Acworth is close up to date, dealing *inter alia* with the Manchester Ship Canal and the M. S. and L. extension to London, the Scotch strike, the Taunton accident, and other incidents of recent occurrence.

NOTES.

THE correspondence which has passed between the Institute of Architects and their opponents in regard to examination, which we reprint in another column, appears to us only to confirm what we have said as to the unreasonable and illogical position of the latter. Because architecture, as an art, cannot be subject to examination, they wish the Institute, apparently, to give up their system of examination in construction and in general education as a condition of membership. If a man is to be entrusted with the construction of buildings as well as with their design, what harm is to be done by an examination to test his knowledge of construction? There can be no question that such an examination is likely to raise the scientific and educational standard of architects in future, and certainly it cannot in itself impair their artistic powers.

THE Bill proposed by Mr. Jacoby, which will enable any householder not only to send away an "organ-grinder," but to forbid him to play again within a quarter of a mile of the house, would soon end in practically extinguishing the organ-grinder, though it would be far more logical to aim at a legislation against all street noises in London except under special supervision. However, Mr. Jacoby means well, and deserves all gratitude for his good intentions, which it is to be feared will be frustrated by the would-be philanthropic Philistines. One of these gentlemen, "R. B. B.," already records his displeasure in a most impertinently personal letter in the *Times* of Wednesday (the kind of letter the *Times* delights to print), heaping sneers on Mr. Jacoby as a wealthy Radical who wants to deprive the poor of their "music." Now, no "music" can be produced by mechanical means; music is a matter of expression. The provision of musical entertainment for the poor, on a proper footing, is a cause we would strongly support, but the abolition of the organ-grinder would in fact be the first and necessary step towards it. In regard to others than the poor, there can be no question that the organ-grinder is the great curse and pest of London life; there is nothing like it in any other city we know of; and it is a disgrace to the Government of London that it has not been put down long ago. The organ-grinder is simply the most offensive and intolerable of street beggars, a useless and obstreperous vagabond, who has no claim to public consideration of any kind, and under whose tyranny we have long helplessly groaned. If the *Times* would have the sense to support Mr. Jacoby's Bill, instead of giving circulation to such sentimental nonsense as the letter referred to, it might have an important effect in bringing about the desired object, and would earn the gratitude of all educated Londoners.

* Great Northern Railway Act, 1850.

AS the Commissioners of Sewers will make a public report on the sanitary state of St. Bartholomew's Hospital after their investigation, it would be unfair to prejudge this report. It is very unsatisfactory, however, to find that there are *primâ facie* grounds for the charge which has been of late frequently made against this hospital, that the drainage is bad. Dr. Saunders reports that it is of an obsolete character. In the hospitals of the metropolis of all places in the world it might be supposed that the sanitary arrangements would be found to be perfect. If it is clearly proved that St. Bartholomew's is not in a satisfactory state, it will certainly cause doubt to be raised about the other hospitals of London. It will also show that some kind of Government inspection of hospitals should take place from time to time in order to keep them in a proper state. These institutions are now so large, and so important a part of the social economy of the Metropolis, that once it is found that anything is seriously wrong with their system of management or their structure, it becomes obvious that they should be supervised from time to time by the proper Government department.

A LONG and elaborate Report by Dr. Barry to the Local Government Board (an interim report only, however) deals with the causes of an epidemic of enteric fever in several towns situate in the valley of the River Tees in South Durham and North Yorkshire. The conclusions from the report have an important bearing on the question of water supply from rivers. The inquiry showed that the disease was conterminous with the water supply drawn from the Tees and furnished by the Stockton and Middlesbrough Water Board and the Darlington Waterworks. The daily pumping of the two combined averages 10,500,000 to 11,000,000 gallons. The water is pumped direct from the river into subsidence tanks, and afterwards filtered through sand and gravel before delivery. The following are some of the circumstances noted as bearing on the contamination of the river:—

"On the north bank or Durham side of the river, about half a mile above the intake, is situate the village of Low Coniscliffe (thirty-three houses), the slop drainage from which is conveyed into an open pool or cesspit situate in an old river course of the Tees at a distance of about 50 yards from its present course. During periods of heavy rainfall a certain amount of this slop drainage passes into the river, whilst in very heavy floods the river actually overflows the portion of the field in which the pool is situate. . . . At a distance of six miles from the intake is situate the village of Gainford, containing some 170 houses, many of which are of good class and furnished with water-closets. Part of the drainage of this village is discharged directly into the Tees, but the major portion is conveyed in pipes to an open ditch running down the side of a field and having its outfall into the river. The soil through which this ditch passes is of a porous nature, and during dry weather the liquid portion of the sewage percolates into the land, whilst the solid filth accumulates and forms a black deposit in the bottom of the ditch. During heavy rain this black deposit is carried bodily into the Tees, and upon one occasion when I visited the outfall, a black streak could be clearly observed in the river for a considerable distance. . . The town of Barnard Castle is reached at a distance of seventeen miles from the intake. Barnard Castle contains over 1,000 houses, and has an estimated population of from 5,000 to 6,000 persons. It is a market town, and during the summer months is a place much resorted to by the inhabitants of the northern sea-coast towns as an inland watering-place. During the spring a regiment of militia undergoes its annual training here, the recruits being billeted in lodging-houses chiefly situate in the lower part of the town near to the river. Nearly 400 of the houses are provided with water-closets. The town has been sewered throughout, and the outfall of the main sewer is directly into the Tees, about half a mile below the town. In addition to this source of pullution there are six privies situate directly on the bank of the river, which discharge their contents on to the foreshore. These privies serve a considerable number of houses, including common lodging-houses and houses in which Militia recruits are billeted, situate in the lowest part of the town. The slop drainage from the majority of these houses is discharged by numerous drains directly on the foreshore, and here also ashes, house refuse, waste building material, and midden refuse have until a very recent period been deposited in considerable quantity. This foreshore during ordinary states of the river varies from 10 ft. to 40 ft. in width, and is only covered when the river is in flood. In the intervals between floods excrement, ashes, slops, and other filth accumulate in very considerable quantity; in fact, the whole of the foreshore becomes covered with a mass of stinking abominations which have to be seen and smelt to be appreciated."

It is also shown that the special outbreaks of enteric fever occurred immediately after the times when the river was in flood, and brought down the deposit from the foreshore. A better disposition of local drainage would of course greatly reduce or even remove the danger, but the report is a very significant one in regard to the theory of regarding open rivers as a natural source of water supply in a populated country.

REFERRING to a paper read at Berlin, by Herr von Miller, describing the aims and programme of the Frankfort Electrical Exhibition, taken notice of in our last (p. 250, *ante*), it may be well to state that perhaps the most important feature of the exhibition will be the attempt made to obtain motive-power from a distant point, thus demonstrating that the motive-power for working ordinary machines giving light, &c, not only for a town, but also for an entire district, can be easily obtained from one central point. In this case, the Neckar waterfalls, which will supply a great part of the power to be employed on the exhibition grounds, are 175 km. distant; whilst another line, constructed on a different system, will start from Offenbach-on-the-Main, running some 7 km.; and the power thus brought to the site will be used for the working of nearly all the more common mechanical appliances of the building, and other trades, commencing with a saw-mill and a smith's shop, and ending with a flour-mill, giving the visitor a picture of what might be done for a small provincial town, distant from a coal-mine, a water-way, or other means of obtaining motive power. Architects who visit the Exhibition will find examples of all kinds of elevators and lifts, and in the "Light" division they will find a practical demonstration how to light a theatre, how to light a panorama, or a picture-gallery, all in full-size models erected specially for the occasion. The Exhibition is very likely to prove a great success, and the meetings to be held in connexion with it, such as the Electro-technical Conference, the meeting of the representatives of the municipal boards of the cities of the Empire, &c., will, no doubt, aid in giving it an importance. Germany, with its Art Exhibition at Berlin and its Technical Exhibition at Frankfort, will take a prominent position in the exhibition chronicle of the year.

DR. TRISTRAM, Chancellor of the Diocese of London, last week made some important observations when giving judgment in regard to a faculty for chancel gates at St. Paul's, Camden-square. He stated that it was the practice of the Court not to grant such a faculty until it was shown

very clearly that such gates would be really useful. He further added that, as churches were now so frequently open during the daytime, these gates might in such cases be regarded as useful in order to prevent persons going into the chancel. It would therefore appear to be a rule of the Diocese of London that chancel gates will be sanctioned where there is any evidence that the church is left open, or is going to be left open, during the daytime. If chancel gates are erected, it is desirable that they should be worked in fitting material, and of good design, and as these gates are likely to increase in number, they will afford excellent opportunities for genuine art work in iron or brass.

TWO points of some interest as to the endurance of timber in contact with the ground occur in a paper on the maintenance of the permanent way of railways, read by Mr. William Greenhill before the Institution of Civil Engineers of Ireland in Dublin on Wednesday last, and of which an advance proof has been sent to us. Mr. Greenhill, in speaking of railway sleepers, says it is noticeable how the endurance of the timber is increased by being taken out of the line for a short time and then put in at some other place. The removal of the sleepers from place to place seems to be beneficial to the timber in some way, and to be conducive to its longevity. On the other hand, Mr. Greenhill says that sleepers in an idle siding decay more rapidly than those in the main line under constant traffic. He is of opinion that no steel sleeper has yet been quite successful; that timber still holds the most important place as the material for sleepers; and that when well-seasoned and protected by its envelope of creosote it is comparatively unaffected by being put into the ground.

THE Engineering and Sanitary Association is now exhibiting models illustrating some recent patents they have taken up in connexion with a new system of road-formation. A dozen 3 in. cubes of granite are attached to each other by a bituminous compound, forming a slab some 12 in. by 14 in., on the under-side of which there is a pad of bitumen, 1¼ in. thick, to deaden the sound of the traffic. These slabs would be laid on a bed of concrete in the same manner as ordinary wood pavement is at present, and connected to each other by running in bitumen between them. It can only be ascertained by actual trial whether the system possesses those qualities necessary for a good roadway, and we understand that the experiment is to be tried at Folkestone, and probably also in London. As the blocks of granite are comparatively small, the foothold for horses will be better than is afforded by the ordinary granite setts now in use, and greatly superior to asphalte. The bituminous pad will, no doubt, lessen the sound of the traffic considerably, but one of the chief advantages of the system would be that the surface, unlike that of wood pavement, is non-absorbent, a quality particularly desirable for roads in hot weather. The first cost of putting down this new roadway should not be very different from that of laying wood pavement; but as the actual cost depends on the life the slabs will have, it is impossible to say at present if it will be more economical than the systems now generally used.

DR. BRUCE LOW'S report to the Local Government Board "on some occurrences of cerebro-spinal meningitis in certain parishes of the Eastern Counties" (Suffolk, Norfolk, and one parish in Essex) is one of the rare instances in which the painstaking investigations, on which these reports are founded, have not resulted in connecting the disease with any special and preventable insanitary conditions. The disease seems to have been very serious in its results, but its appearance at this time in the districts examined is unaccounted for.

LAST week the plans for a new station at the west end of Princes-street, Edinburgh, for the Caledonian Railway, were laid before the Dean of Guild Court. The Dean said it was contended on behalf of the City that the Company were encroaching 9 ft. upon what had for upwards of seventy years been public street way. The agent for the Company, on the other hand, maintained that there was a line in the causeway distinguishing between what was the proper street way and what belonged to the Company. He added that in view of what Mr. Cunningham, C.E., the Company's engineer, said with regard to the matter, it was impossible to keep the station back a yard, as it would interfere so much with the plans. There is a large open space in front of the present station enclosed by an iron railing, but it would appear that the Company not only proposes to build over this space, but beyond it. *Interim* warrant was allowed to enable the Company to proceed with the necessary excavations, but further consideration of the disputed point was delayed for a week.

IN his letter, published in the *Times* of last Saturday, Canon Venables adverts to the fact that the Lords' Committee have passed as "unopposed" the Bill for the destruction of Cockerell's church in Regent's-street. He writes:—"Hanover Chapel is a worthy memorial of his skill,—unhappily, the only one London now possesses." But by Professor Aitchison's letter, which we printed on March 7 last, we are reminded that the London and Westminster Bank, in Lothbury (including the two seated figures, representing "London" and "Westminster"), and the,—that is, the later,—Sun Fire Office, Threadneedle-street, are Cockerell's work. The "Crown" and the "Ship" taverns stood next eastwards of the house and garden of Sir John Houblon, first Governor of the Bank of England.* The "Crown Tavern," and the original Sun Fire Insurance Office, were pulled down to make room for Sir Robert Taylor's additions (1766-86) to the Bank as first built by George Sampson, in 1734, over the site of Houblon's house. Taylor's portion includes what we believe is still known as the Rotunda (rebuilt by Soane), and the Parlour. Timbs says that the private Drawing Office (1836) and the public Drawing Office (1849) were designed by Cockerell. Sir John Soane's extensions of the Bank north and west involved the removal of the "Ship Tavern" in Bartholomew-lane, and St. Christopher-le-Stocks Church. The present Sun Fire Offices occupy the site of St. Bartholomew-by-the-Exchange Church, as rebuilt,—excepting the old tower,—by Wren. That church was pulled down in 1840, and re-erected by Cockerell in Moor-lane, by Cripplegate Without. He is said to have used much of the earlier materials; he followed, mainly, the former design, including the tower. The fourth stage of the old tower was surmounted with a heavy cornice, a parapet, and angle piers. From each face of the parapet rose, instead of a central pinnacle, a high circular-headed window or doorway, which, according to the plate, after Billings, in the late [George Godwin's "Churches of London," was closed with louvres. Cockerell retained these, but left them open. Many hesitate to attribute so singular a composition to Wren; and some think that, if it is due to him, it remained as an incompleted addition to the tower. We may add that Cockerell, in conjunction with W. Wilkins, designed the enlargement of R. Jupp's (1799) second East India House, Leadenhall-street, which was pulled down some years ago for the present East India-avenue buildings. In Mr. Wyatt Papworth's edition (1881) of Joseph Gwilt's "Encyclopædia of Architecture," we find that in London the Westminster Life Office, Strand (*sic*), and the Dividend Pay Office, Bank of England, are also named as amongst his principal works.

*See a plan in the Gough Collection at the Bodleian, Oxford.

PROFESSOR FISCHER has been readin
a paper before the Munich Archi
tectural Society on the history of that almos
universal architects' drawing medium, know
in England as Indian Ink, though in German
it appears to be more correctly known a
Chinese Ink. The ink is credited with
venerable history, as according to a Chines
writer of the fourteenth century it wa
invented by one Tien-Tschen about 2,700 B.C
This ancient ink is described as having bee
a black varnish which was used for writin
with bamboo pens on slips of silk. It i
next heard of as a black stone which woul
dissolve in water (a little poetic licence
probably), and next as a composition obtaine
by burning lac and charcoal. In this form
in the third century B.C., the province o
Kiangsi had a monopoly in the manufactur
and had to send a certain number of ink
sticks annually to the court as a return fo
the concession. The manufacture appears t
have become more complicated in course o
time, and the lamp-black foundation wa
obtained by burning various oils, firwood
bark of the pomegranate tree soaked i
vinegar, and various other substances mixe
in approved proportions. Inferior manu
facturers were known to perfume their ink
with an admixture of musk, which pleases
the thoughtless purchaser but injured th
practical quality of the ink, rendering i
more liable to fade and to be affected b
damp. The lamp-black always played th
most important part in the manufacture of th
ink-sticks; the adhesive matter, for the direc
formation of the sticks, spoken of as a glu
obtained from substances such as rhinoceros
horn, stag-horn, &c., comes next in import
ance. The Professor gave several prescrip
tions for the manufacture of the ink a
it was made at different times, and ex
plained how the different tints of blue-black
violet-black, &c., were obtained, and the
went on to explain the different signs to b
seen on sticks, finishing up by pointing ou
that the Chinese lay great stress on the mod
of keeping the ink. At one time it wa
recommended to keep the sticks in tissue
paper, at another time in a box of ashes, an
then again in lime, lately again wrapped u
in leaves. If Professor Fischer had told u
where to go, at the present moment, for th
best ink, he would have added in practica
value to his lecture. The most costly (an
therefore presumably the best) Indian-ink
sold in England has generally the disadvantag
of being exceedingly brittle, and often th
stick breaks with the mere pressure of rub
bing, which is inconvenient.

LETTER FROM PARIS.

IF we compare the plan at the head o
the last Salon catalogue with that whic
is now prepared, it will be seen tha
some real improvements have been mad
Long galleries (taking a hint from the Salo
National) are substituted this year for th
numerous small rooms which were rathe
fatiguing to visitors. But the architectura
exhibits will not gain by the change. Nothin
seems to have been done by the Committee o
Management to add attraction to this part o
the exhibition, which is usually situated at th
most deserted end of the building. Archi
tecture will still be in exile this year, an
the rooms in which it is exhibited probably
only haunted by a few "professional experts."
The jury of painting, which has been working
incessantly under M. Bonnat, will probably
have terminated its labours by the time these
remarks appear. It includes, as already ob
served, several members of the rival Salon, a
arrangement which has caused no little as
tonishment. Some of these, as MM. Roll
Cazin, and Mathey have had the good taste t
decline, and have been replaced by MM. Fran
çois Flameng, Raphael Collin and Lecomte d
Noüy. The others have preferred, according t
a popular phrase, "manger à deux râteliers."

At the Champ de Mars the Salon Nationa
is in the full swing of its arrangements unde
the intelligent guidance of M. G. Dubufe. Th
sculpture will occupy this year the place re
served in 1889 for foreign paintings. The par
titions which divide the galleries of this part o

the building have been removed, showing the walls of the building, which are to be decorated with paintings by M. Jambon. In the place of these galleries, M. Laforcade, the chief gardener of the municipality of Paris, is to form a large garden in which the sculpture will be displayed with a top light from the glass roof, as in the Palais de l'Industrie. Two monumental fountains, by MM. Dalou and Injalbat respectively, will occupy the two extremities of this garden.

The "Artistes Independants" have inaugurated their seventh exhibition in the Ville de Paris pavilion on the Champ de Mars. This exhibition begins now to attract public notice, and though many of the works might be supposed to have come from the Asylum at Charenton, there are some admirable pictures among them, especially the collection of the works of M. Dubois Pillet, who died last year. We may notice also among other works of merit those of MM. D'Argence, d'Assignies, Pissaro, Polack, Van Rysselberghe, Valton, Rigollot, and Van Gogh.

An interesting exhibition of water-colours at the Gallery of the Volney Club should not be omitted. It includes works by MM. Allongé, F. Régamy and Lobrichon; this latter artist has a special talent for painting children, and exhibits some interesting studies from the Children's Hospital.

"*Ut pictura poesis*," says Horace, and this seems to be the motto of the promoters of a new kind of exhibition to be opened in rue St. Lazare on April 13. This is to be called the "Poil et Plume" Exhibition, and the pictures are all to be the work of eminent literary men. The proceeds are to go to the benefit of the "Orphelinat des Arts." Among the exhibitors will be MM. Meilhac de Goncourt, Sardou, Bergerat, Gille, and Madame P. Gauthier. Deceased authors will be represented by productions of Victor Hugo (whose satirical designs are well known), Théophile Gauthier, and Alfred de Vigny. The exhibition will be an original one, at all events, if nothing more.

The riches of the Parisian museums increase every day. The Louvre has just acquired various important new works, including two pictures left by Paul Delaroche. One of these is by Louis David, the portrait of Mdme. Chalgrin, the other is a fine portrait of Carle Vernet by Robert Lefèvre. The widow and daughter of Isabey, the celebrated miniature painter, have presented his portrait also to the Louvre, painted by Horace Vernet. Another acquisition is in the shape of two little panels hinged together like a book, ornamented externally with fleur-de-lys on a blue ground. On the inner face are the portraits of King René of Anjou and his Queen Jeanne d'Aval. These panels form a very rare and curious example of French painting of the fifteenth century. The Louvre has also acquired a bas-relief attributed to the Hittite nation who inhabited Palestine before the Hebrews. It represents a hunting scene, a curious bit of antique realism.

The Luxemburg has received two busts, one the work of the late sculptor Delaplanche: the other is the work of M. Falguiére, the portrait of the Baroness Daumesnil. The Cluny Museum also has received numerous gifts lately, including some sculpture, in stone, of the fifteenth and sixteenth century, faïence of Nevers of the seventeenth centuries, besides various works in ivory, wood-carving, &c. The Musée Carnavalet has lately purchased, at a cost of 60,000 francs, a collection of paintings and drawings got together by an old dealer in "curios," M. Baur, and which constitutes an interesting monography of old Paris.

The public subscription opened for the Meissonier monument has now amounted to 30,000 francs. The first intention of erecting the monument in the Tuileries gardens between the Marsan and Flore pavilions has been abandoned, as it is thought that it would be lost in the large space of the former Cour du Carrousel, and that it would be better to place it on the quai, in the space adjoining the exterior of the Louvre and known as the "Jardin de l'Infante." It will have later, as a pendant on the same site, the statue of the painter Prud'hon.

For the monument itself there have been two designs. The first represents the painter seated in the meditative attitude of the portrait which has been popularised by engraving and photography. On the steps of the pedestal is the figure of a cuirassier, standing, and at the side a seated female figure representing Art. This was the one preferred by the Committee. M. Mercié, the sculptor, however, prefers the other much more decorative design, in which Meissonier, with arms extended and holding his brushes and palette, is carried in triumph on the shoulders of a group of the soldiers whom he painted so well; a soldier of the Revolution, a grenadier of the Imperial Guard, and a "fantassin" of the present army. After some discussion, the Committee, on the advice of M. Charles Garnier, have left M. Mercié at liberty to follow his own inspiration in the matter.

The Conseil Supérieur des Beaux-Arts, which met a few days since, has had to consider various subjects raised by the Chamber of Deputies, in the course of the discussion on the Budget; more especially in regard to instruction in the national manufactories, the Academy of France at Rome, the financial maintenance and the administration of museums, and the admission of women to the course of instruction in the École des Beaux-Arts. For the consideration of these complicated and delicate questions the committee has been subdivided into four sub-committees. The first, presided over by M. Berthelot, is occupied with the manufacturers' question; the second, under the presidency of M. Jules Ferry, will discuss the museums; and M. Ferry will also preside over the committee of the Academy at Rome. The State instruction in art for women will be considered in a committee under the presidency of M. Spuller. The three chairmen have been successively Ministers of Public Instruction, and have therefore special experience in questions of this kind; the choice of M. Jules Ferry is much appreciated, on account of the services he has rendered to the cause of artistic instruction during the whole of his career as a public man.

The Minister of Public Works, who, as well as his colleague of the Beaux-Arts, is very fond of changes, has been reorganising the Direction des Bâtiments Civils, by the constitution of a superior "Committee of National Palaces," as it before existed from 1876 to 1881. Among the members of this Committee are two painters (MM. Lenepveu and Roll), two sculptors (MM. Dalou and Paul Dubois), and four of the Inspecteurs Générales des Bâtiments Civils, who of course are architects.

After the artistic schism of the last two years, are we destined to see yet a *third* Salon arise? It is to be hoped not; but it appears that a party of artists, among whom are M. Boucher the sculptor and M. Cormon the painter, are taking the initiative in starting an annual exhibition of the works of artists who have received honours at the Salon, or who have gained travelling studentships. It is even stated that this exhibition, which no one is very much in need of, is to be held in the Salle des États of the Louvre.

The candidates for the Grand Prix de Rome have commenced their sketches for entrance, at the École des Beaux-Arts. The subject is "Hamilcar making his son swear enmity to Rome."

The Jury of Architecture has decided the competition for a design for a baptismal chapel, the first prize being awarded to M. Guilbert, the second to M. Hannotère. For the Edmond Labarre prize, founded in 1880, for students of the first and second class, the jury has selected M. Recoura, pupil of M. Pascal.

The death of two sculptors of talent is announced; M. René Fache, formerly professor at the Fine Arts Academy of Valencienne and correspondent of the Institut; and M. Augustin Courtet. M. Fache, who was seventy-five years of age, was an able professor who has taught or influenced a whole generation of sculptors, among whom may be named MM. Carlier, Fagel, Ganquié, Mabille, Desruelles, &c. He was a pupil of Bra and of David d'Angers. His once eminent pupil Aimé Millet died but shortly before him. Augustin Courtet was a pupil of Pradier, Ramey *fils* and Dumont. He was born at Lyons in 1821, and gained a troisième médaille in the Salon of 1848. Many of his works decorate public monuments in Paris, especially the Church of St. Laurent and the Tour St. Jacques le Boucherie.

The Société Centrale des Architectes has lost a few days since one of its members, M. Charles Marot, who for more than thirty years was connected with the "service d'entretien" of the Louvre and the Tuileries Palace, of which he was latterly the Chief Inspector. After having studied under Duban and at the École des Beaux-Arts, he became a zealous collaborator with Visconti, Lefuel and M. Guillaume. We must mention also the death of M. François Athanase Mortier, architect to the Grande Chancellerie of the Legion of Honour, who died last Sunday at the age of eighty-three. He was commissioned in 1872 to reconstruct the Palace of the Legion of Honour, which had been burned by the Communists. He obtained the Cross of the Legion of Honour in 1877, in recompense for this work.

THE LONDON WATER QUESTION.

We last week (p. 250) stated the position of this question before the House of Commons at the present time. We now give our promised *résumé* of the Special Report of the Parliamentary Committee of the County Council on the subject.

Apart from the Bill to be introduced by Sir John Lubbock on behalf of the County Council, it appears from the special report referred to that there have been introduced into Parliament this session three private Bills and three public Bills affecting in some way or other the London Water Question. The private Bills are (1) the London Water Commission Bill, (2) the Southwark and Vauxhall Water Bill, and (3) the Croydon Water Bill. The three public Bills are—(4) the Metropolis Water Supply Bill, (5) the London Water (Meter) Bill, and (6) the Metropolitan Water Companies (Charges) Bill.

Main Questions for Consideration.

In defining the main questions for consideration, the report of the Parliamentary Committee of the County Council says that the Bills are so interdependent that they must necessarily be considered together. The report then goes on:—

"Among the issues raised by the private Bill of the London Water Commission, promoted by the Corporation, and the public Bill of Metropolis Water Supply, promoted on behalf of vestries, there is one of primary importance, viz.:—

1. Should any new body be created—whether Trust or Commission—to whom the London water supply should be immediately entrusted?

And this question involves a second equally important, viz.:—

2. Should the London County Council be the body to deal with the water supply on behalf of the consumers?

To the first of these questions we have no hesitation in recommending a negative answer, and the same considerations which lead us to this will be found to support an affirmative answer to the second question.

As, however, it appears from the pending Bills that the first of these questions will be differently answered by bodies whose opinions are entitled to great respect (the City of London and some of the London Vestries), we think it right to explain the reason for the answer which we propose to give."

The circumstances of London are, the Council urge, the same as those of most other large towns. The question of water supply to London differs in magnitude only, not in principle, from the same question as already fully discussed and solved by the leading municipal corporations for other great centres of population in the United Kingdom.

Reports of Parliamentary Committees and other inquiries, and various local Acts of Parliament, extending over a long series of years, have, the report urges, completely recognised the principles which have been applied to provincial towns. The conclusions of Sir W. Harcourt's Committee of 1880 are quoted, as follows:—

"That the supply of water to the Metropolis should be placed under the control of some public body:

That *in the absence of any single municipal body* to which these functions could be committed, a water authority of a representative character should be constituted; and

That a Bill having that object should be introduced at an early date by the Government."

The report refers specially to this point, because it is asserted that from some printed memoranda issued in reference to the principal Bills dealt with in the County Council report, the words in italics have been omitted, and the conclusions of the Parliamentary Committee may have been misunderstood or not fully quoted; it being stated in such memoranda that a new representative body was recommended by Sir W. Harcourt's Committee, while no reference was made to the fact that that conclusion was based on the then absence of any single municipal body in the case of London to whom these functions could be committed.

It can hardly be suggested, says the report now under notice, that the London County Council is not such a municipal body as indicated in Sir W. Harcourt's report.

Some objections to the transfer of the water supply to the Council discussed.

Under this head we quote the following from the report:—

"1. It is suggested by the advocates for creating a new body that the Council is more overburdened with work than the Corporations of Manchester, Liverpool, Dublin, and other towns, and could not find time for the work. We do not think this need be feared. The administrative functions transferred in 1889 to this Council in the management of the asylums and industrial schools, the main drainage of the metropolitan area, the enforcement of the Metropolitan Building Acts, the management of the Fire Brigade, parks and open spaces, and bridges, with other numerous and important duties, have been discharged without material difficulty, and it is believed with success. It may be urged that there was transferred along with the duties a highly-trained and efficient staff of officers, to whose assistance the Council is largely indebted for such success as it has achieved. We reply that with the transfer of the water supply we shall in like manner be able to avail ourselves of officials equally versed in their various duties, who will doubtless be equally willing to aid us with their loyal co-operation. Even as at present constituted, we have no doubt that the Council is in a position to cope with the task; but experience will indicate, if it has not already indicated, means by which the work of the Council may be accomplished with less labour than at present. The work of the Council during its first years has been necessarily heavy. The experience gained, the organization and arrangements effected during this period, is simplifying, and may be expected to simplify the work in the future. Larger delegation of powers to Committees, the diminution of numbers of members serving on Committees, better distribution of work among Committees, will tend to the relief of the Council, and render it not difficult to find an influential Committee which will devote constant attention to the management of this business.

2. The peculiarity arising from the relative positions of the Corporation of the City of London and this Council.—We feel sure that all members of the Council will duly appreciate the services which the City has rendered to London in instituting inquiries into and dealing with the subject of water supply, especially during the assumed technical disability of the Council and previously of the Metropolitan Board to handle it. We recognise, moreover, the great historical position of the City as justly giving great weight to their representations on any such subject, and we have very carefully considered whether any scheme could be suggested under which some special representation could be given to the City in the management of the water supply. On the whole, however, we are unable to draw any substantial distinction between the position of the City in regard to main drainage and the position of the City in regard to water supply. If any difficulty arise or be anticipated under this head, it arises from relations already anomalous, and cannot be remedied by the introduction of a new body and additional complications.

3. The special circumstances of the towns and districts without the London County boundary, but supplied by the Metropolitan Water Companies.—On this we have only to observe that every problem involved in the relations between London and adjacent districts has been already solved by the experience of Manchester, Glasgow, and other towns.

When we come to examine the special proposals for establishing a new Trust, contained in the two pending Bills, we find that such examinations strengthen the above conclusions."

London Water Commission Bill.

Dealing first with this Bill, which is promoted by the Corporation of London, it is observed that the proposal merely involves the establishment of a Commission to be empowered to consider and submit to Parliament Bills dealing with the subject. In settling any such Bill, says the County Council report, the most important controversial questions would have to be solved by the proposed Commission—questions as to the efficiency of the present and need of future sources of supply; questions concerning the purchase of existing works; and questions concerning the proper mode of charging for water both within and without the county boundary; while there would be another class of controversial questions between the consumers of the water on the one hand, and mill-owners, riparian proprietors, sanitary and other authorities, and other persons interested in the water and watersheds of the Thames and Lea valleys on the other hand. Among these the pre-eminent questions of purchase or application to Parliament to authorise new works would demand immediate handling "by a newly-formed, heterogeneous, and unorganised body with wholly inadequate funds, in the face of opposition unanimous, organised, and with practically unlimited resources."

The proposed constitution of the Commission is analysed as follows:—

London County Council members (including the Chairman of the Council)	21
Members representing outside districts (subject to a provision for their ultimate increase, apparently, to 28)	22
Corporation of the City (including the Lord Mayor)	6
Appointed by Departments of State	2
Total	51

"Upon the questions above indicated, it may be assumed that the 21 members representing the London County Council, and the 22 members representing the outside districts, would have opposing interests, and their numbers being so nearly balanced, the members representing the Corporation would practically have the voting power upon these questions. In fact, the County Council members could not out-vote the members representing the outside district without the support of the Corporation members; while, if the number of the outside members be increased as indicated, they would have a majority of one over the London representatives. Of course, the interests of all the various outside districts represented on the Commission may be different and divergent, but it is conceived that on some of the more vital questions the outside districts would combine.

Having regard to the constitution of the proposed Commission and the manner in which the various interests proposed to be represented thereon would be balanced, even a preliminary agreement upon the general policy to be followed would be difficult of attainment.

And again, even if this difficulty were overcome, and a majority of the Commission concurred in the presentation of a Bill to Parliament, it is scarcely possible that it could be based upon anything like unanimity of opinion. Opponents would have the views of a minority,—perhaps a large minority,—to support them; and the prospects of passing a Bill in the circumstances, opposed, as it certainly would be, by one or more interests affected, would be remote. However disadvantageous to London any such Bill might be considered, either by the County Council or by any large section of the inhabitants, they would probably be precluded from opposing it, as it would have been introduced into Parliament by a Commission on which the Council was represented. Should, however, these preliminary difficulties be overcome, something like the following results might not improbably be expected:—

The object in establishing the Commission is first to secure, and second to manage, the water supply of London and outside districts.

It would be, therefore, necessary to the continued existence of the Commission that it should accomplish the first of these objects.

It can do this, subject to obtaining the necessary Parliamentary powers, by (*a*) an alternative and independent supply; (*b*) acquiring the undertakings of the companies by agreement, (1) including full settlement of all details, or (2) settlement of terms for submission to arbitration; (*c*) acquiring by arbitration on terms not accepted by the companies. They must proceed either by contentious Bills in Parliament, which would, of course, be strenuously opposed by the companies, or they must, if they adopt the alternative (*b*), proceed by negotiation, which would in its essence also be contentious. In either case they would contend on most unequal terms. The companies are united, experienced, deeply interested, well informed, and wealthy. The Commission would be discordant, unorganised, ill-informed, and ill-equipped.

It has no income except a loan of 5,000*l.* from the Corporation to meet its expenditure.

The financial obligations resting upon the Commission are the following:—(*a*) To provide and maintain a fit and convenient office for holding meetings of 51 members and transacting business. (*b*) Appoint and pay a secretary and such officers and servants as may be required. (*c*) Pay auditors of accounts. (*d*) Pay 49 nominated members. (*e*) Disburse all necessary expenditure of the office. (*f*) Make inquiry into the present and possible future sources of supply. (*g*) Promote a Bill or Bills in Parliament (if *in opposition* to water companies a most costly business). The Commission would have the strongest inducement, through lack of funds and the necessity of preserving its existence, to come to terms with the companies; it could neither afford to remain inactive nor to risk defeat in a parliamentary contest with them.

The appointment of such a Commission, unwieldy and incongruous in its composition, and unfitted to enter into negotiation and contest with the united companies, would, under the circumstances described, be virtually to place the interests of the people of London in the hands of the water companies.

The Bill by its vagueness and by relegating difficult questions to the obscurity of the future, escapes objections which would otherwise have been obvious. In this respect the second Bill is very instructive, for the Water Trust proposed by this City Bill must inevitably, when they get to work, find themselves involved in the difficulties, financial and administative, which are more fully exposed in the scheme of the second Bill to which we proceed to advert."

Metropolis Water Supply Bill.

Many of the general objections to the London Water Commission Bill will, in the opinion of the Parliamentary Committee of the County Council, equally apply to the Metropolis Water Supply Bill. But there are some special circumstances about this Bill which rendered it deserving of very close consideration by the Council. It appears that it has been prepared by the "Honorary Secretary to Executive Committee of Metropolitan Vestries and District Boards, Saint James's Vestry Hall, Piccadilly."

"The Bill starts upon the assumption that the existing water undertakings *must* be immediately purchased on arbitration terms. We think most members of the Council would hesitate, without far fuller information than we as yet possess, to commit the ratepayers of London to buy these works at whatever figure an arbitrator or board of arbitration may award, or to enter into an arbitration without Parliament having laid down any definite rules in relation to the terms and conditions affecting the purchase. There are *primâ facie* grounds for believing that the market value of the companies' stocks, as expressed by recent Stock Exchange quotations, is unduly large, being influenced by other considerations than those of intrinsic value; that unduly high dividends have been maintained, money having been disbursed by way of dividends which ought to have been applied to expenditure on matters either neglected entirely or provided out of capital; that the works and plant are in some respects obsolete; that no adequate allowance has been made for depreciation, and above all that heavy expenditure (probably long unprofitable (in the establishment of a new or supplementary system of supply is desirable and perhaps imminent.

The Council has already voted in favour of a resolution asking the Government to institute inquiries covering fresh sources of supply. If, as appears not improbable from the reports made by the officials of the Government and of the Council, it should prove that the present sources of supply are, or soon will be, inadequate,* and that great expense will have to be incurred to procure fresh sources of supply, this fact will materially diminish the value of the property which the municipality is to acquire under the arbitration. And yet, as this Bill stands, the arbitrators, in the absence of definite instructions from Parliament on the subject, would probably have neither the power nor the disposition to take this fact into consideration. They would certainly not be obliged to do so; and the arbitration might thus saddle Londoners with the price of an undertaking one-half of which would be valueless to them.

Should there be no real ground for suspecting any of the above-mentioned contingencies to exist, it would seem most inexpedient that an outside body without the experience of the Council and its predecessors,—in fact, devoid of experience on the subject,—should commit London to the result of such an arbitration.

One of the principal clauses of the Bill (6) is so drafted as to place the proposed Trust under a statutory obligation 'to carry into effect the purposes of the Act,' not only by the acquisition of the companies' undertakings, but also 'by the enlargement and improvement of their waterworks, the construction of new waterworks, and the supply of water from *new* and *independent* sources.'

It has been suggested to us that this is a mere error in drafting; but the explanatory memorandum sent us by the promoters seems to leave no room for doubt that the clause is so framed by design. It would impose on the Trustees the 'trust' not only of purchasing the whole of the existing works, but also of constructing new waterworks and supplying water from new and independent sources, a policy to which it can scarcely be conceived that the inhabitants of London ought to stand committed. It is probably no exaggeration to affirm that whereas a totally new and satisfactory series of works might be provided at an estimated cost varying from 10,000,000*l.* to 15,000,000*l.*, this extraordinary scheme might cost London, if carried out as proposed by the Bill, some indefinite sum approaching 50,000,000*l.*"

The arbitration provisions of this Bill seem to the Parliamentary Committee of the Council to be open to grave objection. Clause 13 provides that the Arbitration Board shall consist of four members, to be appointed respectively by the Local Government Board, the Institute of Bankers, the Institution of Civil Engineers, and the Surveyors' Institution. Apart from purely speculative suggestions as to the policy of these nominees, "they are expressly made arbitrators within the meaning of the Lands Clauses Acts (clause 13, sub-par 3), so that there is as it were a statutory direction, not only to award the costs of the arbitration as against the purchasers (subject to some special powers not

* On this head we may refer the readers of the *Builder* to some remarks contained in recent issues of the "Annual Report of the Local Government Board," and commented on in the *Builder* for December 1, 1888, p. 393; November 30, 1889, p. 386; and October 18, 1890, p. 306.

affecting the principle), but to make the additional allowance in respect of compulsory purchase which has become habitual under the Land Clauses Acts."

"By paragraph 14, the Arbitration Board are required to have regard to the value of the undertakings 'prior to the introduction into Parliament of the Bill.' This is probably intended to prevent the arbitrator from basing his award on any increase in the selling price of the stocks which may be brought about with a view to influence the award. But we think it is not unlikely to have another effect, which should be guarded against, and may bind the arbitrators to an award of not less than the 'market value' of the stocks prior to the introduction of the Bill. It is obvious that if half of the suggestions above made in deterioration of the value of the water undertakings have any foundation in fact, they will become matters of public notoriety, either during the progress of the Parliamentary proceedings, or after the passing the Bill into an Act (if it should pass), and although the disclosure of any such facts might reduce the saleable value of the stocks to accord with the intrinsic value of the undertakings, it is probable that this result would be excluded from the consideration of the Board of Arbitration under the terms of this section 14. We feel no doubt that the promoters and the Council would be in accord on the principle involved.

It is true that the power possessed or claimed to be possessed by any company to make up deficiencies in the dividends of previous years is stated to be abandoned, but whether any such power exists, and whether but for this enactment an arbitrator could properly take it into consideration is very doubtful."

After discussing the financial scheme of the Vestries' Bill, which is condemned as intricate and unsatisfactory, the report of the Parliamentary Committee of the County Council summarises the main objections to this Bill as follows:—"1, Multiplication and confusion of jurisdiction; 2, Unsatisfactory and extravagant finance; 3, Interference with principles of rating, and delegation to another body of a power to mortgage the rates; 4, Delegation to arbitrators of principles which should be determined by Parliament; 5, Delegation to arbitrators of too wide and vague powers; 6, Unsatisfactory character of arbitration tribunal; 7, No direction to the arbitrators, except such as will enhance price; 8, The establishment of a *new* body to carry out this enormous transaction with the Water Companies; 9, Enabling the vendors with all their accumulated experience, knowledge, and official strength to deal with purchasers entirely inexperienced and devoid of information or the sources of information essential to success."

The report then continues:—

"It is at best doubtful whether the substitution of any Commission foreign to the Council for the Companies would not have other disadvantages. The Council has now the power to criticise and oppose on petition, if necessary, Bills introduced by the water companies and to suggest legislation as to the supply of water and subjects incident thereto. But it could hardly do this in the case of Bills introduced by a Commission or a system of supply adopted by a Commission. The Council as representing the inhabitants and ratepayers has many questions to consider and deal with. Among them are: -1. The efficiency of the works for existing and future requirements. 2. The price charged. 3. The method of supply. 4. The interference with streets. 5. The destination of surplus profits arising from the water supply, all of which might involve a constant conflict between the Council and the Commission, as between the Council and the Companies.

The sole interest of a Commission, like that of the Companies, would be to show a margin of income over expenditure. Any such margin would probably be applicable in reduction of charges for water supplied. It is so expressly provided by the Metropolis Water Bill (subject to a provision as to the 'equalisation of water rents and all charges incidental thereto throughout the metropolitan water area'). In short, the Commission would be representing the consumers of water throughout the whole area of supply, whose interests are by no means identical with those of the metropolitan ratepayers, who might nevertheless be compelled to keep the commission going by making up any deficiency in income. The Commission would not be the rating authority, it would not be charged with sanitary duties or the supervision of public health, and it is conceivable that it might adopt, or seek to adopt, some system of charge or supply which would bring it into immediate conflict with the Council in its natural policy of securing for the poorer classes as large a supply of water with as little charge to them as practicable."

Second main question discussed.

This leads the Committee to the second main question proposed at the outset of their report, viz., Should the power of dealing with the London water supply be now entrusted to the Council? The Council, they point out, has already taken two important steps in this matter. It is inquiring, under powers given by an act of last year, into the question of fresh sources of supply, and it has petitioned the Government to institute an independent and authoritative inquiry on this all-important question. Every step in the investigation, says the report, "reveals the importance of caution in regard to the question of taking over the existing works and the terms on which they should be taken." It is obvious, they add from the facts stated in the Engineer's reports* that the necessity for new sources of supply will very soon be imminent. Says the Committee, in this connexion:—

"It is a matter of notoriety that the water of a river like the Thames, passing great and increasing populations, and itself the residence in the hottest months of no small population in house-boats, must be more or less polluted with sewage, excrementitious matter, and vegetable and animal refuse; and it is a necessary subject for investigation how far a water in which these ingredients prevail can be safely relied upon in the future as the only potable water accessible to the greater part of London.

It appears from more or less authoritative reports that the Thames water as supplied to London is in certain circumstances responsible for the spread of disease; that it is at least occasionally coloured, turbid, and inefficiently filtered, and the extent to which the works of particular companies are in this respect defective may have an important bearing on the expediency of purchasing them.

It follows that if the Council takes up the water supply, a demand for a new and purer water supply is sure to arise, and the Council may be forced into a very large expenditure on a new scheme."

As to the Statistics of other Towns.

The Parliamentary Agent to the Council has obtained information from most of the principal Corporations of the kingdom who are supplying water, showing in tabular form:—The area and population within their municipal limits; the area and population supplied by them without their municipal limits; the cost of the waterworks; the rates charged; and the system of supply adopted in the area outside the municipal limits.

"From the information thus obtained it would appear that if the Water Companies were to obtain in payment for their undertakings anything like the figure which they are understood to ask, and which was suggested by Mr. Smith's agreements,† the Council would start with old waterworks costing per head of population supplied a considerably larger sum than any of the other great waterworks of the country. Should it be proved that a new and independent supply, or new works, or even extensive improvements and modifications of existing works had to be undertaken, of course this sum would be largely increased. It must, however, be remembered that whereas many of these are gravitation works, a great part of the London water supply is derived from pumping; and, further, that the Northern towns have been subjected to considerable expenditure in respect of compensation water which the metropolitan companies have escaped, and consequently the accounts of the provincial Corporations and the metropolitan companies require some adjustment before accurate comparison can be obtained.

Regarded by other tests, such as the capital cost per million gallons of water supplied, the London waterworks bought at the companies' valuation would be a most costly purchase.

We think, therefore, that great caution is desirable in dealing with the matter, and that the Council should only purchase the undertakings of the Water Companies on principles directly indicated and laid down by Parliament previously to entering into any reference.

It is abundantly clear that the Water Companies have no statutory monopoly of the supply of water, that a supply amply sufficient for all the purposes of the community could be introduced from an entirely independent source at a cost of about one-half of the price demanded by the Water Companies, and that the introduction of such supply is subject to the authority of Parliament.

It must be remembered that our predecessors, the Metropolitan Board of Works, as long ago as 1873, thought such a proposal desirable, when they introduced a Bill to authorise a supply of potable water from the chalk hills, while the following passage (passed unanimously) from the report of Sir William Harcourt's Committee deserves to be most carefully borne in mind:—

'Your Committee must observe that if the contention of the Companies is well founded, the population of the metropolis and its suburbs, amounting to four millions of people, would be left at the mercy of certain trading companies, armed with the power of raising the price of one of the first necessities of life to an extent, practically, without any limit; a situation from which the Companies seem to consider there is no escape, except in the purchase of their undertakings at such a price as they may be willing to accept. If that were the only remedy, the consequences to the consumer of the improvident legislation of the past would be indeed intolerable. But *Parliament is not unequal to redress such mischiefs to the public interests.*'

The more fully the agreements of 1880 are considered the more improvident they appear, and care must be taken that in any arbitration these agreements should in no way be allowed to prejudice the question.

The Bill of the Vestries contains, it should be observed, clauses giving the London County Council power in the months of November and December, 1891, to take upon themselves the powers and duties intrusted by the earlier part of the Bill to the proposed Water Trust. But these clauses do not fit on to the rest of the Bill, and may at any time be omitted, and even if they were passed as they stand they would place the Council in a most unsatisfactory position. The Council then newly elected would have to decide with very short notice whether to undertake the duties or not. If it refused it would be open to a charge of abdicating its functions. If it accepted it would be accepting the invidious function of purchasing from the companies on terms which are, as above shown, most unfavourable to the consumers. That the Council will have to acquire such part of the property of the Companies as is valuable and efficient we do not doubt. But it must be on proper terms, not on such an arbitration as is provided for by this Bill. It must be a purchase founded on the real value of the property, not on dividends or on market values which largely depend on dividends.

If there is to be arbitration, any arbitrator assessing the price should be bound to consider, not the existing market value of the Companies' stock or dividends paid by them, but the actual intrinsic value at the present time to the inhabitants of London of the series of waterworks which they are asked to purchase.

It would seem not unfair that he should consider (and not exceed) the cost which a totally new and satisfactory source of supply might be expected to involve, and he should consider the value of potable water drawn from the existing sources under existing statutory and sanitary conditions as compared with the value of water which might be obtained from purer and more abundant sources.

It may be added that in the case of some of the companies,—the New River Company more especially,—the property includes a large extent of landed estate with houses thereon, the acquisition of which by the Council is not in any degree essential. There are, however, some properties now occupied as reservoirs or otherwise which it would probably be necessary to acquire in the first instance if the purchase were carried out, and it would be necessary for the Council to obtain powers to deal with these by sale or leasing, should the consolidation of works admit of their being dispensed with.

We have prepared a short Bill seeking powers for the Council to introduce into Parliament Bills dealing with the water question. Leave can be at once obtained to introduce this Bill if the Council is prepared to support it, and having regard to the fact that the other Bills are pending, and will, having been read a second time, be referred to a Committee, practically no additional cost will be involved by this course, as the Council must be represented before the Committee in any case."

The ultimate conclusions at which the Committee arrived and which the Council has adopted were printed in our issue for the 21st ult. (see p. 230, *ante*). The Council have adopted the report, and Sir John Lubbock has, as we have already stated, introduced the London County Council's Bill on the subject.

Of the other Bills mentioned in this report, we need only add that the Metropolis Water Companies' (Charges Bill), introduced by Mr. Causton, has for its object, as defined in the "Memorandum," the prevention of the increase of water-rates in London by reason merely of an increase in the annual or rateable value, which may be unconnected with water supply, and may involve no increased consumption of water. It is proposed to declare that the rate charged in the last financial year shall not be increased because the rateable value is raised, except for some adequate reason. The London Water (Meter) Bill, introduced by Mr. Gainsford Bruce, proposes to give the water consumers of London the option of paying for water in proportion to the quantity they use; and with that view it proposes to empower them to require to be supplied by meter. The Croydon Water Bill and the Southwark and Vauxhall Water Bill are Bills for extension of works, &c.

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* We hope to be able to give a summary of these reports next week.

† Under which it was proposed to buy up the London Water Companies at a cost of about 35,000,000*l*. For a full discussion of the subject at the time see the volume of the *Builder* for the first half of the year 1880, especially articles on pp. 180, 301, 593, and 750.

"THE HOUSE THAT JONATHAN BUILDS."*

If you will pardon my being briefly autobiographical, I should like to say in the first place that it is some fifteen years ago since I, with you on most occasions at my side, Mr. President, sat in this room and listened to the words more or less weighty, which fell from the lips of those potent, grave, and reverend Seignors, learned in the law of things architectural who, at such times, came to visit us. I might have prophesied then, that after the lapse of not so many years you, sir, would be the active and honoured President of this Association which in the interim has advanced with measurable strides towards that goal of distinction, utility, and esteem to which we, who knew it in its days of juvenility, looked hopefully forward. But little did I think that I myself would be standing upon this platform, a layman, talking to architects concerning subjects anent which my hearers, possibly, can teach me many valuable truths. The fact is that during the years which stretch between the present time and my active membership of this Association I have wandered far from the architectural fold, and have betaken myself to the one profession which I venture to conceive is at the same time as arduous, and, perhaps, less profitable, as that to which I formerly belonged, and in which you, gentlemen, are all, I know, one day or another, to achieve great and glorious renown. But, while I have exchanged the ruling-pen and the set-square for the quill and printer's ink, I have always retained, and to-day still take, a lively interest in my old trade. I have to thank it for one thing, at all events; and that is for a habit, early formed and never laid aside, of that constant and sub-conscious observation of the buildings with which he may be surrounded which leads an architect, or an architectural student, to be a perennial and perambulating critic of his brethren, present and past, domestic and foreign.

When I mention further, that with eyes influenced by this habit I have, for the last twelve years, been living in Yankee-land or Dixie's-land, for I may say that in both the Northern and Southern States of America I have not only lived but have actively practised the architectural profession, I think I have laid before you, I hope with not too much prolixity, such claims as I have upon your attention for the few desultory remarks to which you are about to be kind enough to listen upon the house that our cousin Jonathan is wont to build for himself. Let me say right here that the bill of fare which I offer you will contain very few solid or compactly nutritive dishes, but there are times when trifles even though not quite so light as air, are of assistance to the intellectual digestion, even if they do but create an appetite for more substantial fare. I am going to enter into no elaborate defence of American architects, as some of you may have imagined, and, so imagining, have perchance made ready and whetted the keen-edged knives of reprobation and satire, nor am I going to bombard with the heavy artillery of adverse criticism architecture as she is spoke in the United States.

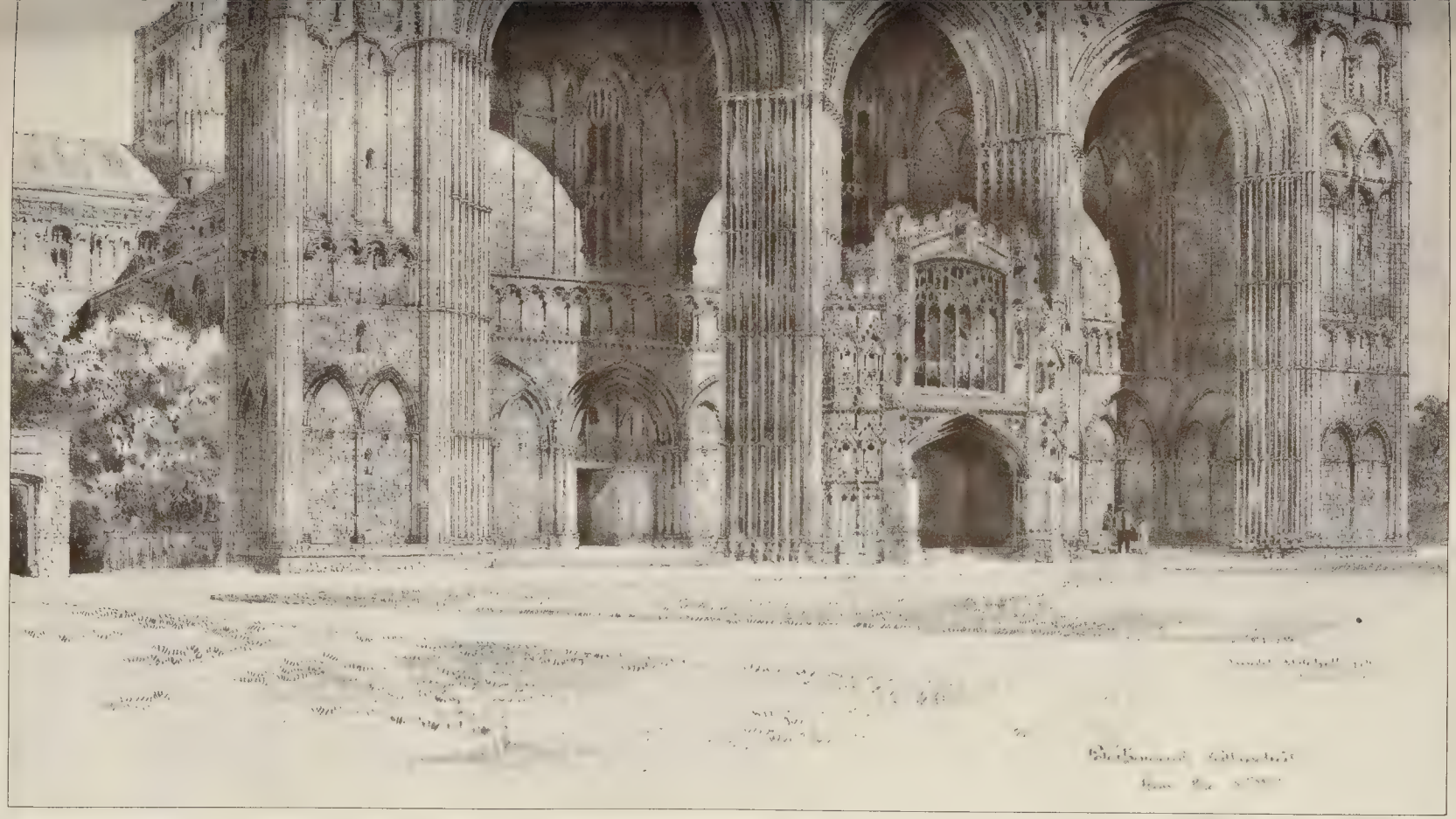
The architectural history of North America will not require an extensive array of bookshelves to contain it. When the early colonists, the stolid Dutch burghers of New Amsterdam (for New York, as you will doubtless remember, was originally settled by emigrants from Holland), the sedate Puritans of the New England States (who have left their descendants of to-day, among other legacies, that Puritan conscience and hatred of frivolity which has impressed itself in a measure upon New England architecture), or the gentlemen adventurers of Virginia and Maryland, had advanced beyond the initial stage of providing for themselves mere shelters from the inclemency of the climate, they looked to the mother country naturally enough for their architectural style; but for materials, to those forests which stretched around him for so many thousand square miles, and wood remains to-day, as it was in the seventeenth and eighteenth centuries, the main reliance of the American architect and builder. Of the early works to which I refer, but few examples remain to us; but those few examples have been so well taken advantage of by the native architect, have so impressed him as being the representative of the only mitigated antiquity to which his country can lay claim, that they have modelled to no inappreciable extent American architecture of to-day. You would be surprised if you could see what good eighteenth-century work there is to be found in America. The city halls of New York and Philadelphia, and certain churches in Maryland and Pennsylvania, are models which could afford valuable hints to the most devoted and learned student of Wren and the Queen Anne architects of our own country. Nor is the old domestic work which is to be found everywhere throughout the more early settled States, such as the old manor houses along the valley of the James or the Hudson rivers, and a few of the older city houses of Boston, New York, and Philadelphia, to be despised. A quaintly free Classicism; an ingenious use of wood, where stone or brick in this country would naturally have been used; a refinement and grace of detail, carving, and moulding; mark the work of this period, which, for want of a better name, the American architects have dubbed Colonial. A term which, at least, is more comprehensive, and founded more on actual fact, than our terrible misnomer of "Queen Anne." About the beginning of the present century, however, architecture became practically a lost art on the other side of the Atlantic, and it was, in fact, not until towards the close of the Sixties that any real and healthy regeneration took place. The last score of years, however, may fairly be termed a period of Renaissance as regards domestic architecture in America. The casual tourist may not at once be impressed with this fact when he rattles through Broadway, in New York, or the broad avenues of Chicago; he sees public buildings of a deadly monotony of ugliness and inartistic brutality on every side, and, naturally enough, says to himself that "all is barren," from the Dan of the Atlantic to the Beersheba of the Pacific. It must not be forgotten, however, that architects in America, or rather those architects who can lay worthy claim to the title in its most honourable sense, find themselves absolutely debarred from any prospect of ever having under their control any Governmental work; either that undertaken by the Federal authorities or by the more local legislature of the various States. In the former case the principles of the Governmental system place all buildings, including post offices, custom houses, and so forth, in the hands of a salaried government officer in whose appointment politics, as the word is understood in America, and that to the initiative means a great deal, plays no inconsiderable part. In the latter case, even if there be no State architect or State engineer corresponding to the Government architect aforesaid, no professional man who respects himself and his calling would consent to follow out the course of wire-pulling and log-rolling necessary to secure for himself the commission of building any important edifice. Thus one sees ignorant pretentiousness and sheer ugliness flourishing wherever public funds are expended in marble and granite.

The case is very different when one turns to the city or country house of the rich man, or even to the office building, bank, or railway station erected by those monopolistic, but liberal corporations, which form the leading feature of American commercial life. The private American is an excellent client, and in this fact I think is to be found the *raison d'être* of much that is good and better than European work in the American school of to-day. He gives his architect, as a rule, a perfectly free hand, and to those of you who have suffered, or have seen others suffer, under the captious interference and pitiful niggardliness of the British client, this will appeal with peculiar force. The fact is the American is too busy, as a rule, and too business-like to bother himself about the details of his house or warehouse. He goes to an architect, so he says, because the architect knows more about building a house than he does, and he would as soon expect the architect to meddle with the fashion in which he himself deals in stocks or pork, as put his own finger into the architectural pie. On the other hand, he has a very clear idea of what he wants, and, as a general rule, he wants the very best that he can get, whatever he may pay for it. Thus in not a few cases the professional man across the Atlantic has an absolutely free hand, and, if he be gifted with artistic conscience, he does a great deal better for his client than if he were hampered and harassed by continual fidgetting and interference. When I first made up my mind to become an emigrant, my ideas as to America and American life were of the vaguest. Such conception as I had of the country and its inhabitants led me to believe that, though they were a people who knew how to make money, and somewhat ostentatiously expend it when they had so made it, they had but rudimentary notions of the fine arts, including that of architecture, and were not particularly well informed in the science of life and luxurious living. If I thought of an American house at all, I have no doubt I had a hazy notion of a mud-beplastered log-cabin, standing in the midst of a rude clearing, as representative of the country dwelling; and of a wooden shanty with four square windows and a door, as the typical town-house. You in England to-day have doubtless learnt more of America and the Americans than we knew of them ten years ago, but I assure you that my ideas were then shared by the vast majority of my fellow Englishmen. I am not sure, after all, that you have got so very far beyond that stage of ignorance even now. Since I have returned, the most extraordinary questions have been put to me as to the tenour of domestic life in America, and only the other day a worthy lady evidently thought I was chaffing her when I assured her, upon my honour as a Christian and a gentleman, that American houses in the larger towns were sometimes built of other materials than wood, and that there were some American families in which servants were kept, and in which the wives and daughters did not do all their own housework. The fact of the matter really is,—and it is a fact that, I am glad to say, is becoming appreciated over here,—that no one in the world knows how to live better than the average American. I mean the Americans of the Eastern States, be it understood, most distinctly; for I will not deny that in the far off west, the south, and the north-west, there are certain crudities and roughnesses which are apt to set cultured teeth on edge. The New Yorker and Bostonian, and, to a less marked degree, the Chicagoan also, are cosmopolites in the truest and most admirable sense of the term. They have taken something of the best from every nation of the world; a hint here, an idea there, a suggestion from somewhere else, and the result is that they are better housed, better fed, better amused, better warmed in the winter and cooled in summer, than any European or any Asiatic.

Take the ordinary house of the middle-class American and compare it with the building of the same class on this side, and I think the odds will be found to be very largely in favour of the former. It is, in the first place, if a city house, better and more conveniently planned. Domestic service is an expensive luxury in New York, the result being that everything which will reduce household work to a minimum and render friction as non-existent as possible, is a distinct pecuniary advantage and worth taking a great deal of trouble to attain. My experience has therefore been that in most American houses of the class to which I refer, the relation of the domestic offices to the living and reception rooms is much more carefully studied, with the result of a vastly greater convenience both to servants and their employers. Such little labour-saving devices as lifts, or dumb waiters, for the carrying up of dishes from the kitchen to the dining-room, or for the sending down of soiled linen and so forth, from the top of the house to the basement, are much more universal there than here. The interior arrangements of the kitchen also, compare most favourably with the domain of the London cook. The comparative advantages of English and American kitchen ranges are not for me to discuss, but there is certainly less trouble and less work connected with the latter than with the former. There is one point, at least, in which the American house compares absolutely favourably with the English, and this is as regards the heating systems employed. Americans are exposed all over their vast country to extreme variations of temperature. They have accordingly been forced in self-preservation to so construct their houses that they shall be habitable when the thermometer is in the neighbourhood of zero, and at the same time shall not be too stifling when the temperature is semi-tropical. We in England, though we may not be exposed to quite the same variation, have something of the same nature to contend with. But we do not set

* A paper by Mr. Horace Townsend. Read before the Architectural Association on the 20th ult., as mentioned by us last week





Cathedrals of England and Wales.

No. 4. PETERBOROUGH.—Drawn by Mr. Arnold Mitchell, A.R.I.B.A.

bout it (or at least have not for a great many ndred years) with the same reasonableness as e American. To all intents and purposes it is ractically as cold when the glass is at 32 g. as when it is from 10 deg or 12 deg. or en 20 deg. below that point, and yet it seems me the average English house is built for mmer alone, and as though no such thing as inter existed. Since I returned home, at the ginning of this winter, I have hardly known hat it was to be warm within four walls, hether of a house, a theatre, or any other ublic building, unless I were standing or sitting ithin two feet of a blazing coal fire. Now the merican goes to work to warm his house a very different plan. It has required no very peculiar Yankee ingenuity his part, no very serious scientific udy of the question; he has simply said himself that in order to be warm in his use he must warm the house itself, and not e separate rooms thereof only. It is this ndamental principle which makes so great a fference between one's winter comfort in the o countries. I need not dilate upon the rious methods employed by the American to tain the desired end, but I should like to omentarily take up the cudgels in defence of e much-abused system of hot-air heating. e stories one hears of oppressive floods of ked, scorching air, which are supposed to rm one of the horrors of Yankee life, if the les of some returned travellers may be beved, are, in my humble opinion, sheer and diluted nonsense. The average American use is heated, not by *baked* air, but by *warm* air. Pure, fresh, cold air is drawn to the basements, heated to any degree hich may be desired, by an ingeniously nstructed furnace, and discharged through n-lined ducts into every room and every ssage of the house. The cost is trifling, e system is easily regulated, is absolutely safe, quires but little attention, and esults in a gree of comfort of which you can form no ea until you have become habituated to it. his thorough and universal heating of a house sposes to a certain extent of another problem, hich seems to me as unsolved to-day in this untry as it was a decade ago, though it has en one on which a vast amount of talk has en expended, and about which volumes have en written. This is the problem of effective ntilation, and, as I say, it disappears almost tirely when one has to deal with a house the r of which is throughout of one universal temperature, and which does not practically consist, s does the English house, of a series of more or ss efficiently heated rooms, separated from ch other by halls and passages of semi-arctic mperature. Something more of material mfort too is the result of these thoroughly eated houses. One can practically abolish ors, save for the purposes of securing ivacy, and the whole ground-floor of a use may, therefore, be thrown into one, d much valuable space gained for living rposes, which in this country would be asted on passages and hall. Most charming fects are gained in the smaller city houses of merica by this means, rooms being thrown to one by the raising of a portiere or curtain, d charmingly artistic vistas being thus ained. It has also led to the practice, which is n admirable one in a country where the verage building lot is never more, and frequently less, than 25 ft. in width, of placing e staircase hall in the centre of the house, ith the rooms rear and front opening into it nd connected by it. But the average American f moderate income does not live in a house at ll. I don't mean that he camps out in a tent, r that he is altogether homeless; he lives in flat; and I can quite understand the hudder of disgust with which this announcement will be heard by those whose notions f flat-life are gathered from that system as leveloped in London. A Londoner said to me he other day that in London a flat was ooked upon as a luxury. If this is so, all I can ay is that London ideas of luxury and my own notions of the same article are several miles part. The London flat is a creation of the ast ten years, and among the many sins for which that decade has to answer at the Last Day, it will, I am sure, be held the chief. The etter class of New York flat has its disadvantages, it is true. What is there in this decidedly second-rate world of ours which has not? Take it all in all, however, it is as convenient, comfortable, and economical an abode as intelligent man has yet devised for himself. By its means the New Yorker is enabled to live in a fashionable or convenient neighbourhood in a house,—or, at all events, in a portion of a house,—built in a style comparable only to those of the richest of his fellow citizens, and he pays for it the rent which he would have to pay for a small house in an inconvenient and distant suburb. Architecturally, the apartment-houses, as they are termed in New York and the larger cities of America, are among their most admirable features. They are run up to a somewhat alarming height, it is true, for though land in New York is dear, dearer even than in London, the atmosphere is free, and of this fact the American has taken advantage. But he has not thought it necessary to build a jaundiced-looking barrack with oblong holes punched into it in place of windows as one wicked individual, at all events, has done in London, and this abnormal height is from a practical point of view a matter of little moment; for when one ascends to one's apartment in a lift or elevator, as in Yankeedom it is termed, it matters little whether one stops at the third story or the thirteenth. The average number of storys, however, does not exceed nine or ten, and it is a significant fact that the rents are very often in direct proportion to the height of the story. The same principle is carried into the apartment-house as prevails in the ordinary dwelling-house. The staircases and passages leading to the various floors are not, as seems to be the fashion in London, cold, cheerless, and wind-swept, but are warm, carpeted, and decorated, as are the halls and staircases of a private house. The typical flat, when one enters it after stepping out of the elevator, consists of an inner hallway, or passage, from which open out the various rooms; some of these derive light and air from a central shaft, but as many as possible have direct communication with sun and air. Everything is done to economise room, and I think many valuable hints would be gained by English architects from a study of the plans and specifications of these American flats. The servants, as a rule, sleep upon the top floor, access to which is gained from each flat by a private staircase in the rear; the entire flat is heated either by steam or hot water, as the case may be, and in addition to this, there are open fireplaces in all the principal rooms. From the kitchen a dumb waiter or small lift runs to the basement, and is used by tradesmen for sending up their goods, and by servants for sending down the ashes and so forth. Coal and wood are kept in the cellar, and sent up every day as required by the janitor or caretaker attached to the premises. A large refrigerator, carefully drained, is as a rule built into the butler's pantry. The woodwork is generally hard wood, and exceedingly elaborate mantels and over-mantels with mirrors and bric-a-brac shelves, and so forth, are among the permanent fixtures. Cherry and ash are the predominant varieties of wood used, though mahogany is by no means uncommon. In the newer flats the lighting is effected by means of the incandescent electric system, and this, as well as the heating, is included in the rent. Some quarter of a century ago the ordinary house in New York was what is termed a brown-stone front, and was quite as hideous and unarchitectural as anything we can offer in this country. The exteriors were all cast in one mould, and the plan was always more or less on the same line They have changed all that now, and nowhere can a more interesting variety of elevation be found than in the more newly-built districts of New York. Even the so-called speculative builder's house is pleasing to the eye, and I have in my mind a couple of short streets in the upper part of New York which I used to pass every day, and which were entirely built by one man, an ordinary building speculator. Instead of going (as I think the same man here would) to an architect, even if he went to an architect at all, and getting from him the plans of one house, to be afterwards reduplicated as often as necessary, the American got half a dozen architects, all of acknowledged position, to design for him a number of houses of somewhat similar plan, but of absolutely varying elevation. The result is a street, which in its variety of gabling and fortuitous contrast of colour and material, is as picturesque as anything one can find in the oldest quarter of one of the oldest Dutch towns. The interiors of these small houses, which are let at a moderate rental, are arranged with a care and eye to effect, and are fitted with an opulence of detail as regards the woodwork, which could only be found here in such houses as rich men built for their own occupation.

I have said the Americans are better amused than any other nation; their amusements are certainly better housed The American theatre, both before and behind the curtain, is better arranged, on the average, than any playhouse in the world. They have thrown overboard all the hampering conventionalities which are still in force here, and render the English theatre, with all its arrangements, but a servile copy of that which was good enough for our grandfathers and great-grandfathers. As regards its plan, the American theatre is so arranged that the line of sight from every seat therein to the stage is, as a rule, perfect. The fact that the entire ground floor is taken up with what we should call here the stalls renders the task of planning, and of securing adequate entrances and exits somewhat easier, it is true, than that set before the English architect; but, at the same time, no such dangerous death-traps as one finds in London would be permitted in America. The building law of New York is in most of its provisions most admirable, but no sections are more commendable than those which expressly concern the erection of theatres or other buildings intended to be used for the purposes of public entertainment. It is provided that every theatre shall have at least one front on a public highway, and that on either side of such building shall be left a clear space of not less than 8 ft. in its narrowest part, and that this space shall begin from the line of the prosceni um wall and extend the whole length of the auditorium. No portion of any theatre can be used for any other purpose, while as far as possible the entire building and all it contains must be of noncombustible material and all stage woodwork scenery and so forth must be rendered noncombustible by approved means.

I hardly think I should be doing you any service by dwelling at too great length upon the purely artistic side of American architecture or of the value of the work of American architects—work you are perhaps not only more competent than myself to judge, but are probably just as well informed concerning, by means of the professional journals which so frequently contain reproductions of their prospective plans and elevations. Do not, though, be too ready, as I fear the fashion here is, to sneer at what I may euphemistically term their eccentricities. They may be vulgar at times, their straining for novelty so-called may occasionally be offensive to the judicious, but at least they are reaching out, blindly, it may be, but still honestly, towards a style of their own. That they will eventually, and perchance have even now attained their end, I sincerely believe,. That, of course, is only my personal conviction, but I feel sure you would share it had you been as I have actually been over the greater part of the North American continent and had you seen, as I have seen, the thoroughly good and artistic work which their best men are turning out The birth of the new style begins where all former architectural styles, we may be sure, began with—domestic work so-called—the building of the house, namely. But from that it will surely pass on to the monumental, and possibly, for they are a religious people in the main, to the ecclesiastical style. As regards this last named, it must be confessed that they are at present in a very parlous state indeed, and so many miles behind the English that the latter are quite out of sight. Nothing quite so shocking or so harrowing as the American vernacular church work would be permitted here by the public authorities. Detail is the weak point of the average American architecture, but his Gothic detail amounts to a crime. Of course, they have had Richardson, whom most of you, I am sure, know by name at least, and in Richardson they can claim the greatest architectural genius the English-speaking world has seen since Wren's days. "The King can do no wrong"—and Richardson's church work was almost on a level with his secular performances, which says everything. But Richardson is dead, and, like all men of the highest genius, he was a snare and a delusion to his followers. A big man intellectually, physically, and artistically, he was of such strong and marked an individuality that his colleagues had perforce to be his imitators, and the greatest menace offered to American architecture is the influence of this departed Titan, which is responsible for the presence of swarms of little tin Richardsons on wheels,

who are flooding the country with weak imitations of Richardsonian Romanesque, marked by all the vices but giving only pale reflections of the virtues of the original. Turn, on the other hand, to their country and town houses, and in the work of such men as Stanford White, of the firm of McKim, Mead, & White, of Richard Hunt and others whom I could name, though doubtless with but little benefit to English hearers, and one finds a restrained originality, a freshness of *motif* growing to a thoroughly trained cultured perception and trained knowledge which you would not find it easy to parallel on this side of the Atlantic. In speaking of American country houses, and in comparing them with those of England, it must be remembered that the country house, as we understand it here, the permanent home, that is of our richest and most cultured classes, the centre, indeed, of the higher English social system, does not exist in America at pre-eat. Even their largest country houses, and they have some very beautiful ones, are but the summer cottages "writ large," and they are necessarily marked by the cottage-like feeling of the primal type from which they have been evolved. As to their public buildings, I have already pointed out in what respect they are hampered regarding Government and Municipal edifices; but of their offices and corporation buildings I may say that though not so prominent as their domestic work, they are at least not quite so immoral as their churches, and such examples as the new *Times* building in New York are worthy of any country. This, I may say, is one of those exaggeratedly tall buildings the condition of real estate affairs in New York,—built, as it is, on a narrow island which admits of no circumambient extension,—forces on the native architects. Disproportionate, however, as is its height to its width, it has been treated with such consummate skill, that as one looks at it this is the last thought with which one is impressed. Without entering into any detailed criticism of the modern American architectural style,—for it has, I think, nearly outgrown the stage of fashion, even if it has not fully developed into its powers,—I may say that so far as I am aware its followers are the first architects in any nation who have journeyed with the sister arts of painting, music, and literature into the realms of impressionism. I can imagine I see some of you shake your heads, as though impressionism were a demonstrable mis-nomer as applied to architects. But a little reflection surely ought to convince you that such a thing may, under certain conditions, exist, and the study of modern American architecture will lead you to the further conviction that somewhere someone has at all events got upon the track of it. Architecture of course is not to be precisely and scientifically compared with the other arts in this respect. Nick-names and badges, such as that of the term I am applying, are somewhat reprehensible and dangerous, and are often but the outward sign and symbol of intellectual ignorance, but I think one can see that an artist may so design his building that the spectator may carry away from it, when he departs, a vivid impression of one particular feature in especial, and that that feature will for ever after be so intimately associated in his mind with that building that its image, to the exclusion of other features, will primarily be called into imaginative existence by his reminiscent faculties. Perhaps it will be the entrance, perhaps the roof, or a certain bay, or a particular chimney-stack, that is thus insisted upon, not to the detriment of other features, but to their semi-oblivion, and thus we shall think of the house, if it be a house we are considering, as the house with the door, or with the chimney, or the bay, or what-not. Again, a quality alone, or even a dimension, may be the impressive note. We may simply be struck with an ideal of domesticity, or of grandeur, or of simplicity, or with the sense of loneliness, or height, or breadth; the principle is the same in both cases, and, though this is only a half-digested idea, I am inclined to think there is a truth underlying it which is at present only imperfectly comprehended even by those whose work most strikingly evinces it.

And now, gentlemen, I have taxed your patience long enough; I frankly stated when I began that what I had to say to you would possibly be of no exceeding or practical utility, but I did not set forth to you in so many words the purpose which lay back in my own mind of the somewhat inconsequential and hastily-thrown-together remarks concerning those trans-Atlantic relatives of ours who are cousins, not only in blood but also in art. This purpose was to call your attention to the fact, or, rather, to lead you to find out for yourselves the fact, that before another generation has passed America is likely to have shaken off the leading-strings of the Old World as far as regards the art architectural, and to have worked out her own salvation in this most comprehensive of all the arts. I do not speak hastily when I declare my conviction that nowhere in the world is there a more healthy revival of architecture in progress than in America.

Mr. Owen Fleming said he had very great pleasure in moving a vote of thanks to Mr. Townsend for his admirable paper,—a paper which was admirable alike in matter and in manner. No one could look at the illustrations in the American architectural publications without seeing that architecture in America, and especially domestic architecture, was making great strides. The Americans, it seemed to him, were gradually evolving a distinct and very excellent style of their own, especially in domestic architecture. American architecture might be said roughly to consist of three divisions: domestic architecture, civic architecture, and ecclesiastical architecture; and, as Mr. Townsend had said, the domestic work was certainly far and away the best. It was true that the American architects did sometimes put forth some most extraordinary detail; but, if that were excised, there remained architectural elements of such character as bade fair to become the nucleus of a distinct style. With regard to their ecclesiastical work, it was true that they sometimes did some most excruciating things; but then it should be remembered that the Americans had been cut off from the study of the best buildings of ecclesiastical architecture. In that department of their work they had necessarily had to confine their study mainly to books, and the results showed very clearly how detrimental a thing that was. It was true that all rich Americans and, he was glad to say, a large number of architectural students, now made it a duty to cross the Atlantic, and visit the monumental buildings of Europe. As a result of that, he hoped and believed that they would develop even in ecclesiastical architecture, a style of their own founded partly upon the work of Richardson, and partly on the works of antiquity. There was one point, however, upon which he should have liked Mr. Townsend to have given them a little information,—viz., as to the enormously high buildings of New York and other cities. Did they not seriously interfere with the enjoyment of light and air and sunshine in streets?

Mr. T. E Pryce said that he had very much pleasure in seconding the vote of thanks. No one who had followed the illustrations of the American journals could fail to be aware of the way in which the Americans were, as he thought, running ahead of us in their domestic architecture. He at any rate had been conscious of that for a very long time. Of course it might be said that they had certain advantages over us in their wider choice of materials; timber being used by them to an extent which was impossible with us. He understood that the late Mr. Richardson built very largely with marble. That was a material that we could not use in this climate for our exteriors; partly, perhaps, on account of its cost and partly on account of its want of durability. But there was one material which he thought we might use much more largely externally, viz., granite. But even in our interiors we did not use the best materials at our command. Whether it was because we were too economical or too stingy, he could not say. With regard to what might be called the official or government work of the country, he regretted to say that here, also, such work was not, as a rule, entrusted to prominent architects; but was left in the hands of a government department. There was no doubt a great deal in what Mr. Townsend had said as to the importance and desirability of the whole house being equably warmed and maintained at one temperature; but whether the American plan was altogether suited to our requirements he did not know. There was no doubt that in the arrangement and appointment of their houses and residential flats, the Americans were far ahead of us; but were not their rents comparatively much higher than those which we paid?

Mr. Lanchester, in supporting the vote of thanks, said he always understood that the American was content to pay a considerably larger percentage of his income, for the purpose of being comfortably housed, than the Englishman; therefore, as a rule, the American architect had a better chance of building comfortable houses than was afforded to the English architect. As to heating, he had always understood that the American system of heating tended very much to dry the air, and had very deleterious effects upon the constitution of the people. He remembered that some years ago there came over to this country an American engineer named Leeds, who sought to introduce the American system of heating in our houses; but after a time he came to the conclusion that we ought to ventilate with cool air, and to substitute radiating coils, instead of open fireplaces for the purpose of warming the air instead of introducing the air warmed. He (the speaker) had been told by an American gentleman that he found that it was impossible to keep ivories in his house in America; for they came to pieces owing, presumably, to the introduction of hot air into the rooms. Possibly a system of warming which would have that effect upon ivories would require to be used for some generations of Englishmen before their constitutions became adapted to it.

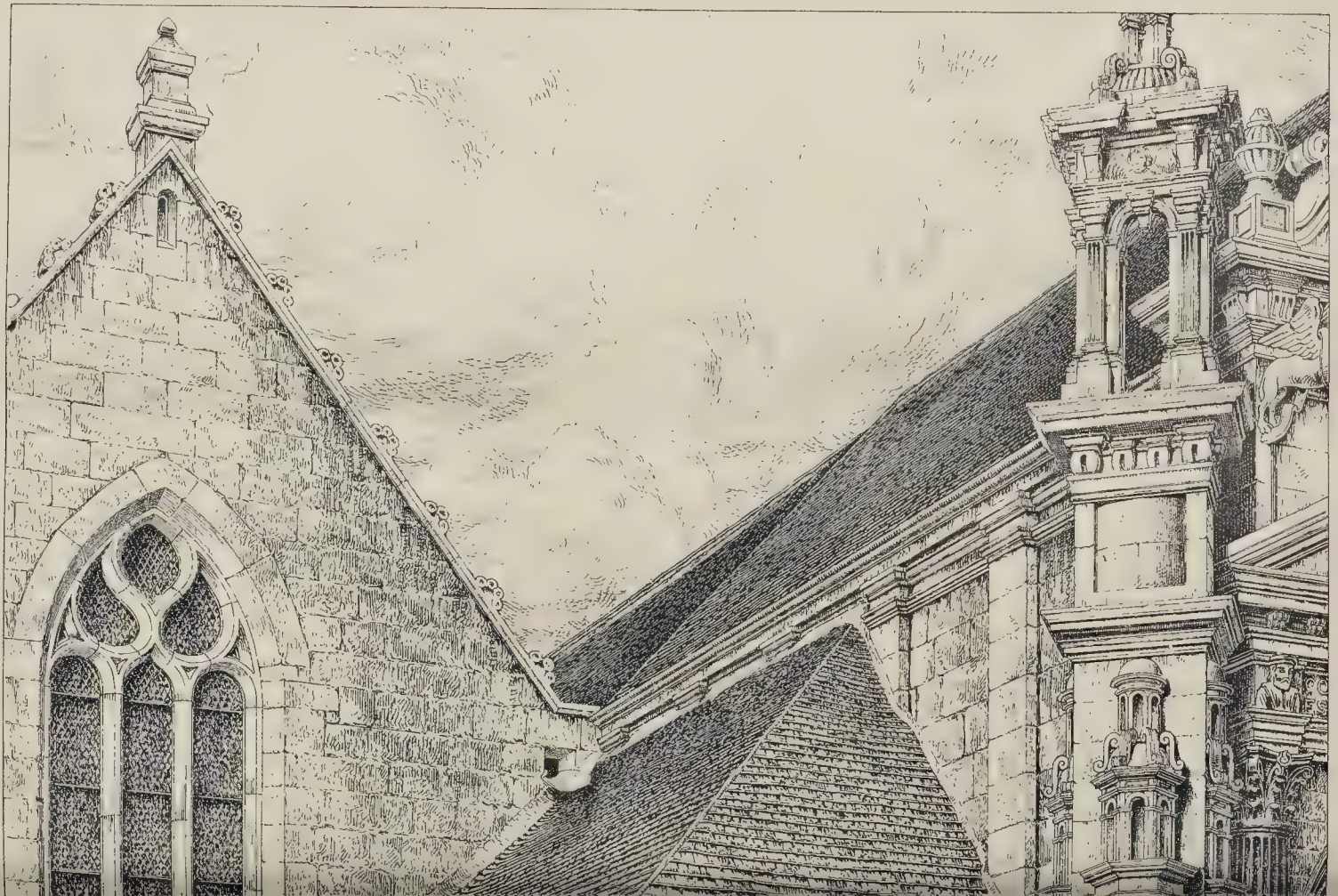
Mr. C. H. Brodie said that as one who had visited the States and had seen most of its large cities, he had very great pleasure in supporting the vote of thanks to Mr. Townsend. In the main he was able to cordially endorse what Mr. Townsend had said. As far as the American house was concerned it was far ahead of our English houses; and while speaking of American houses, he would most emphatically enter his protest against a remark which was made in a letter in *A. A. Notes* to the effect that American houses consisted of very little more than a series of cupboards. He must rather take exception to Mr. Townsend's remarks about the architecture of Chicago. To his mind some of the finest specimens of modern architecture were to be found in the big buildings of that city, and he alluded especially to those designed by the late Mr. J. W. Root. He was very glad indeed that another English architect had, after prolonged experience of American houses, expressed his agreement with the views which he (the speaker) had previously ventured to bring before the Association.

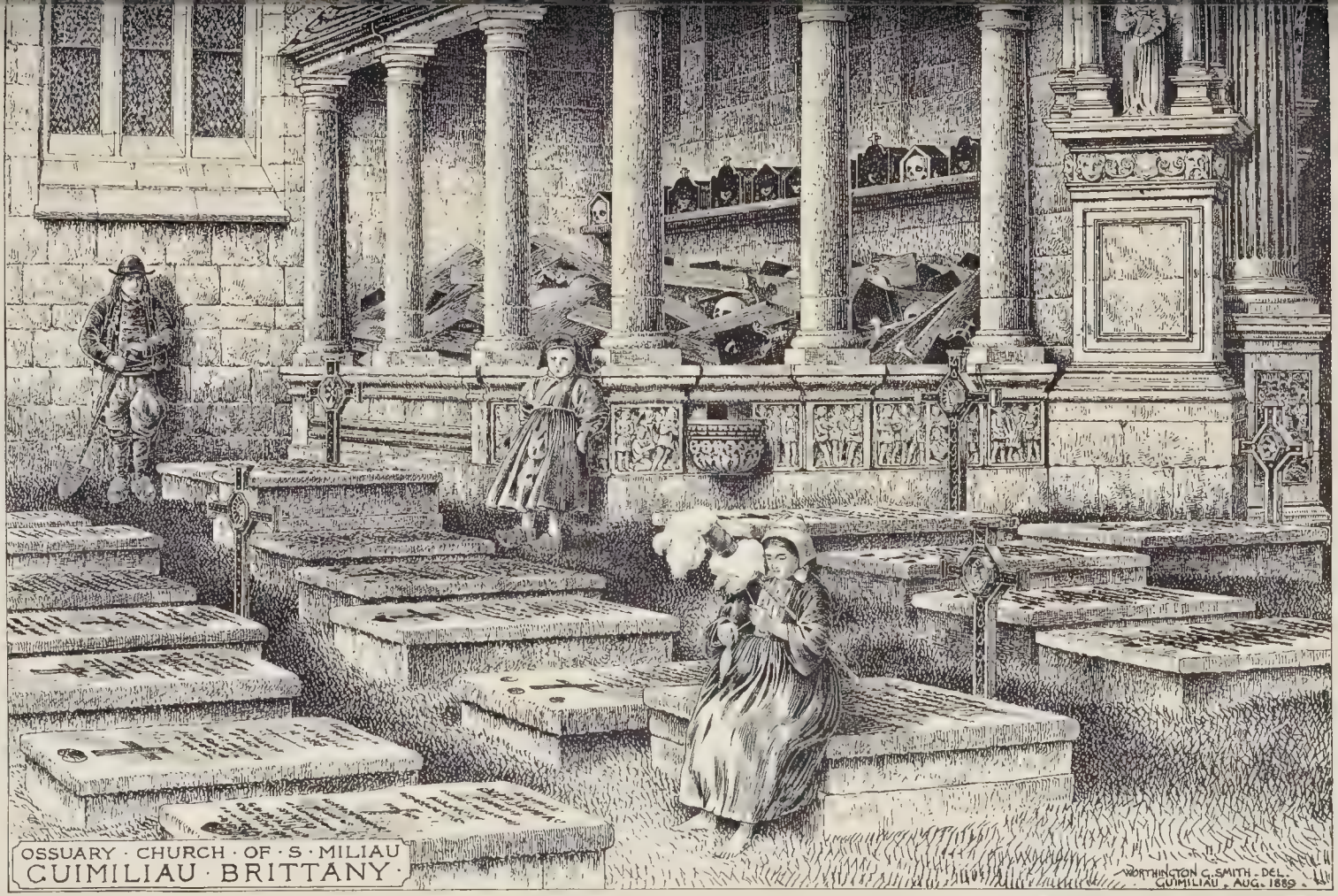
Mr. Moore, while supporting the vote of thanks to Mr. Townsend, said that it might possibly be true to a very large extent that we knew nothing of American architecture; but on the other hand he ventured to suggest whether it was not possible that, as Mr. Townsend had been absent from this country over ten years, he was not quite posted up in the present position of English architecture? Our knowledge of American architecture was no doubt chiefly gained from the illustrations which we saw in the American journals; but judging from them he had come to the conclusion that American architecture might be divided into two categories: the cast-iron and the rocky; the former style being used for public and commercial buildings and for town residences, and the last-named style for domestic buildings in the country. A great many of their buildings, he had struck him, were ultra-picturesque.

The Chairman (Mr. Leonard Stokes, President), in putting the vote of thanks, said he thought that Mr. Townsend's paper was calculated to set them thinking in a direction that would do them good. It was undoubted he thought, that American architects were running away from us in the character of their domestic work, in spite of what Mr. Moore had said about their fondness for the ultra-picturesque. Mr. Townsend had very usefully warned them against the influence of a great man –of the dangers of copying a great man. Just as in America there were "little tin Richardsons on wheels," so there were in the country little tin Shaws, whether on wheels or not. Mr. Moore has suggested that possibly Mr. Townsend was not thoroughly posted up in the latest achievements of English architects. He (the Chairman) devoutly hoped he was not, for he had been spared the sight of the awful results of attempts at imitation by the little tin Shaws.

The vote of thanks having been carried by acclamation,

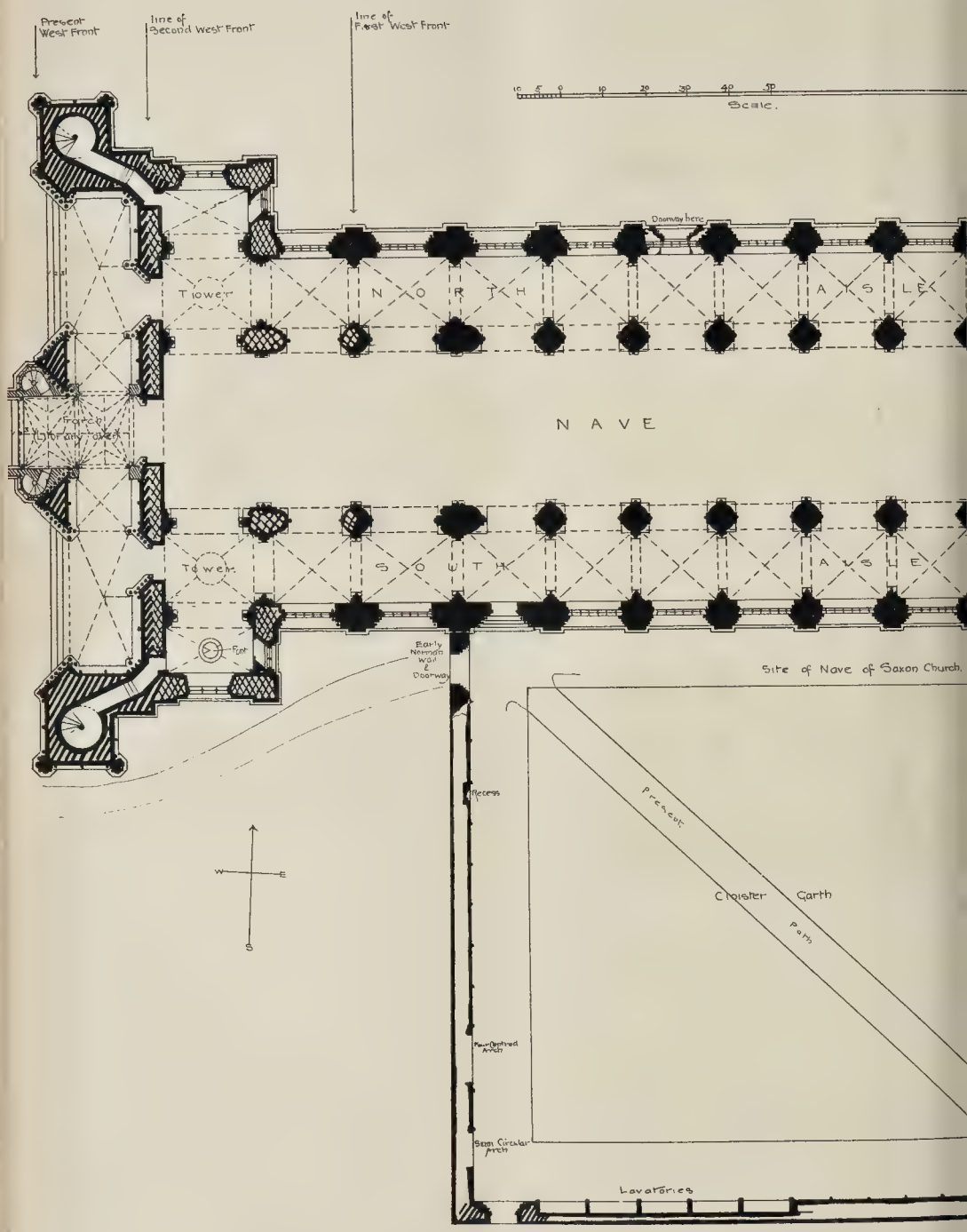
Mr. Townsend briefly replied, and thanked the members for the kindness with which they had received his paper. With regard to the possibilities of the ecclesiastical architecture of America, he did not think that they would



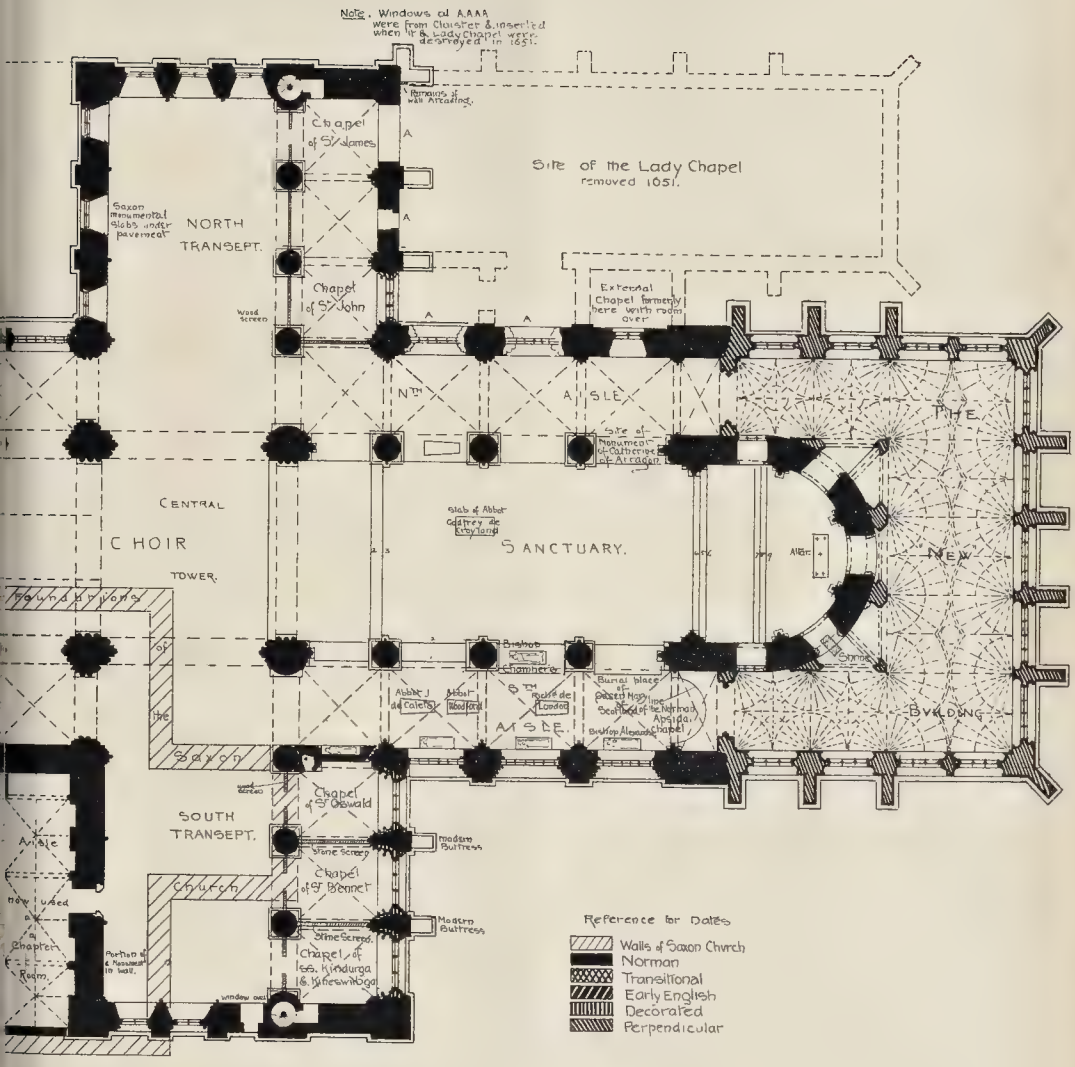

OSSUARY · CHURCH · OF · S · MILIAU
CUIMILIAU · BRITTANY ·
WORTHINGTON G. SMITH · DEL.
CUIMILIAU, AUG. 1889

THE CATHEDRAL CHURCH OF ST. PETER, PETERBOROUGH.

GROUND PLAN.



1891.



Roland to Paul
mens. et delt. 1891.

PHOTO LITHO SPRAGUE & CO 22 MARTINS LANE CANNON ST LONDON E.C.

achieve anything in that direction unless they struck out in an absolutely new direction. As to the great height of buildings in New York and other American cities, there was no doubt it was very detrimental to the free circulation of air and sunshine. He had been partly instrumental in having a Bill passed by the New York State Legislature to limit the height of buildings; but after it was passed it was discovered to be unconstitutional. As to the use of marble by Richardson, it was true the Americans used a great deal of marble; but after all it was only a very fine stone, and he thought we had some stones of equal excellence in this country. He had to thank Mr. Brodie for his highly appreciative remarks in endorsement of what he had said in the paper. As to heating by hot air, he did not think that it was so deleterious to the inmates of the houses as was generally thought to be the case. The air need not be baked or scorched; if it were, it would be owing to the carelessness of the servant or stoker. As a matter of fact, heating by hot air was the only means available within a reasonable limit of expenditure, for to have a steam-boiler for every house would be found exceedingly expensive. It was true that ivories were found to crack, but he did not believe that that was due to the system of heating. He believed it was due to the climate, to the excessive dryness of the atmosphere, and he was supported in that view by his experience that if a wet sponge were kept in the same case with the ivories they would not crack. As to the comparative price of house rents in New York and London, he thought that the balance was not against New York, where the landlords were content with smaller profits, and the taxes were less than they were in London.

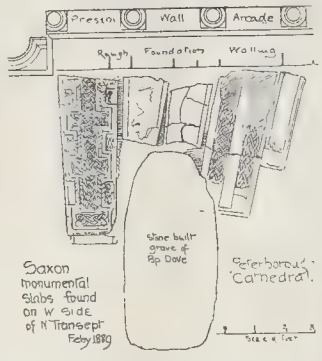
The meeting then terminated.

Illustrations.

PETERBOROUGH CATHEDRAL.*

AFTER a period extending over about seven years, the structure of Peterborough Cathedral church has now assumed its former appearance, if we are to except the absence of the four pinnacles or turrets which formerly crowned the central tower. It was during the rebuilding of this lantern, when everything in the nature of fittings was necessarily removed, and the foundations generally examined, that the traces of the early church, which we are able to show on the plan, were discovered and plotted. Whether or no these foundations are of the church which immediately preceded the great Norman building begun by Abbot John de Sais, it seems extremely probable that the relative proportions were to some extent taken as a basis for the plan of the Norman work. The dimensions of the Saxon building of which we have the foundation walls of the transepts and choir still in existence, have been approximately doubled in the Norman work, whether by accident or design. The site of the Saxon nave would occupy the space on which stand the nave cloister-walk and the south aisle of the present nave, and digging,—a matter of no great difficulty so far as the earth is concerned,—would reveal without doubt the extent westward of the early church, and determine whether or not it had aisles.

The doorway at the north-west angle of the cloister, which is inserted in a portion of a very early wall, happens to be central with the centre of the Saxon church, and may mark the west wall of the church. It is also a curious coincidence that the length of the nave, supposing it to be taken from the wall to the western piers of the Saxon central tower, is exactly half the total length of the present nave of the Cathedral. Fire, so often chronicled in the history of these establishments, destroyed the church existing at the beginning of the 12th century, and Abbot John de Sais, in March, 1117, began the erection of the Norman work, and we may reasonably suppose that, following the usual method, the work was commenced at the east, allowing for the larger scale on which his building was designed, the idea may, in all probability, have occurred to design the new work to occupy some portion of the old site. The space, too, north and east of the first church seems to have been a burial-ground of importance, and Saxon monumental slabs have been discovered in the north transept (see plan and diagram here given). The new church would thus occupy the ground that was associated with the early history of the Abbey.



The apsidal termination was adopted here, as in other great churches of the time, the aisles also being finished in a similar manner. One of the side apses was recently laid bare, and has been marked by a step in the south aisle (see plan).

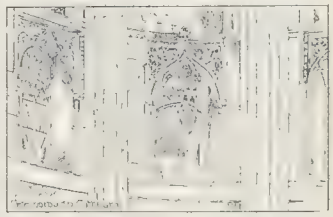
Although the design has been pretty closely adhered to throughout the long period which the remodelled church occupied in building, there are many traces in the detail, chiefly in strings and the sudden alteration or abandonment of ornament, which serve to denote that there was a stoppage from time to time in the works. It is westward of the central tower, however, that the more important changes in the structure are apparent. The second column westward of the crossing differs on plan from the first and other columns for eight bays from the central tower. It is quite possible however that this alteration in plan was either for the sake of variety (as in the Sanctuary where there are round, octagonal, and twelve-sided columns), or to mark the termination of the monastic choir westward. This purpose it now serves for the new return stalls recently put up. For six bays westward of this the columns are the same as that of the first column west of the crossing. The respond, however, of this bay is of larger dimensions, and marks the first termination westward, or more properly speaking, forms one of the piers which supported the west towers which were intended, or built. In Transitional times the nave was lengthened by two bays, and shallow western transepts were thrown out beyond the aisles north and south. Its design can be partially traced to day, but it has been considerably dovetailed into later work.

The desire for future extension was not apparently satisfied, and in the thirteenth century (its exact date is not recorded) the present western "porch" was erected. That it is unique is not to allow that it is in every sense satisfactory. However much we may admire the boldness of the conception, there is a lack of relation to what is behind it which almost causes regret that the earlier front of Transitional times, which certainly expressed its meaning better, was not spared. It is now impossible of course to say what the original Norman front was, but the design of the great arches of Peterborough recall strongly the great Norman arch of the west front at Tewkesbury Abbey, a monastery which belonged the same order—the Benedictine. An interesting point also with regard to the gradual spreading of the design may be suggested. It may reasonably be conjectured that, considering the church to be symbolical of the Cross, the base should take the form of the "Calvary," or steps. In the plan of Peterborough, it is the more apparent on account of the second projection formed by the small towers which flank the last façade; but the projecting towers, as at Wells, might well have been suggested by this endeavour to make symbolism largely enter into the design.

We have given this amount of space to the description of the Norman work, as it forms so large a portion of the existing fabric. The remaining portions of later date occur mostly eastward. As at Ely, a Lady Chapel was erected by William Paris, prior (1274-1296) parallel with the Sanctuary on the north side, and was approached from the north transept, and north ambulatory. For this purpose the outer wall was pierced (at AA on plan) the columns still remaining. In 1651 it was destroyed however, and also the cloister, and some windows from the latter were placed in the wall, which was again built up.

The remodelling of the east end of the church was the first work of Abbot Richard Aston, 1438 1496, and of Robert Kirton, who succeeded him. The Norman Apsidal terminations to the aisles were destroyed, and a rectangular building was thrown out eastward of the great apse, forming an ambulatory, and giving space for five altars against the east wall. The treatment of the external wall of the apse, to make it accord in some degree with the new work, forms a very picturesque portion of the interior.

The wall of the apse had already been pierced in Decorated times, and the very beautiful work (of which we show a portion in the subjoined



sketch) was inserted. The two side windows on the outer face of the wall (the delicate traceried work shown formed the rear-arches only) were glazed, and still retain their saddle-bars. The extension or "new work," as it is still called, rendered this unnecessary, and it not only seems to have been removed, but the three windows which occupied similar positions in the curved bays of the apse were destroyed, and perpendicular tracery inserted. The wall of the apse seems at this time to have been richly decorated with fresco consisting of heraldic shields on a diaper background, some considerable traces of which yet remain. The only other additions of importance were the central lantern, of Decorated date, and recently rebuilt from the foundations, and the chapel over a vaulted porch, which was so curiously inserted under the middle arch of the west front (see view), and which is now used as a library. But scanty remains exist of the monuments. Some effigies, including a mutilated one of Bishop John Chambers (d. 1557), and a curious tomb and effigy of Bishop Alexander, of Allwalton marble, still



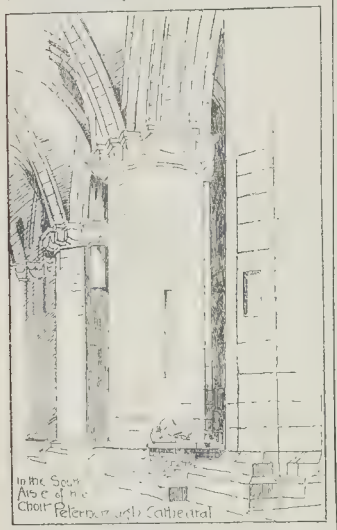
exist in the south aisle. A curious early shrine, with rude figures carved on its sides, and finishing with a coped top, has been placed in one of the recesses of the apse on the south-east. A good fragment of ironwork still remains on the door to the west aisle of the south transept (see sketch), now used as a

* We may mention here that the first of this series of illustrations of the Cathedrals of England and Wales, viz., Canterbury, appeared in the *Builder* for January 3; the second of the series, viz, Lichfield, in the number for February 7; and the third of the series, viz., St. Albans (before the alterations of recent years), in the number for March 7. The fifth of the series, viz., Wells, will appear in the *Builder* for May 2 next.

singing school, and for meetings of the chapter.

The sites are shown of the burial places of Catherine of Arragon, and Mary of Scotland, in the north and south aisles of the Presbytery respectively. Nothing, however, remains of any monument in either case.

Of the former fittings of the choir, some remains of the thirteenth-century choir stalls are to be seen in the chapel of St. James in the north transept. Parclose screens remain in the eastern chapels of both transepts, and the traces of the screens which stood between the Presbytery arches are still visible on the Norman columns (see sketch of south aisle of



Presbytery). The font, now in the south-west transept, is modern, with the exception of the bowl, which appears to be of the thirteenth century. With the exception of these few details, however, the interest of Peterborough lies almost exclusively in the early work of the main fabric. Of the abbey which adjoined it on the south, the walls of the cloister exist and some considerable remains of the infirmary standing south-east of the garth with its chapel. The cloister is apparently of fourteenth-century date, with later details inserted. The Early wall at the north-west angle with its doorway has been already referred to.

The refurnishing of the choir has been commenced. Blore's organ-screen, throne, and stalls have all been removed, and the first portion of the new stalls, designed by Mr. Pearson, are now the only permanent fittings in the choir. The steps on the plan have been shown as they at present exist, but in time further alteration will, no doubt, become necessary when a new reredos is placed in the sanctuary.

We shall give next week a few further sketches from Peterborough, by Mr. Arnold Mitchell.

OSSUARY AT THE CHURCH OF S. MILIAU, GUIMILIAU.

THE church of S. Miliau, with its famous Calvary and Ossuary, is in north-west Brittany, nine English miles south-west of Morlaix, and thirty miles east of Brest. The accompanying photo-lithograph is taken from a drawing made in the churchyard of Guimiliau. The chief and best-known attraction at Guimiliau is the magnificent Calvary, with the large figure subjects in sculpture taken from the life and passion of Christ; one of secondary interest is the south porch and Ossuary here illustrated. The Ossuary is a receptacle for human bones dug up in the churchyard in the process of grave-making, for old broken forms and boards used at interments, for broken skull-boxes and skulls, and for churchyard and church rubbish generally. At the south-west corner of the Ossuary is a holy-water stoup, and on the wall at the east is a long stone shelf furnished with small boxes or hutches (in various stages of dilapidation), each containing a human skull, minus the lower jaw. Notwithstanding the Ossuary and the skull-boxes, it is common to see numerous human bones lying about in the churchyards not only at Guimiliau, but in various other churchyards in north-west Brittany.

As to the strange practice of the preservation of skulls in boxes on stone shelves in churchyards, an old village woman at Guimiliau gave the following explanation. She said that after the dead have been buried for seven years, it is the custom of the grave-digger or sexton to re-open the grave and remove the head (minus the lower jaw) of the dead person; the sexton then cleans the head inside and out, and presents it to the nearest living relative of the deceased. The sexton, of course, gets a fee for this, and the old village woman added that many poor people nowadays had no money wherewith to pay the fee, and so were obliged to do without skulls. The relative of the dead accepts the head, pays the fee, and gets the village carpenter to enclose it in a box, which is nailed up all round, surmounted by a cross, and pierced in front with an orifice, representing a heart, a trefoil, a cross, or some other design, through which the skull can be partially seen. The hutch is painted black, inscribed with white letters, and placed on a shelf in the churchyard. The inscriptions are in French, often with the bad spelling so familiar in English, in some village churchyards in this country. The lettering is in the following style:—"Ci-Git Le Chef de Marie fse Rannou, décédée le 24 9bre, 1850, Épouse de Charles Caroff" ("Here lies the head of Marie Françoise Rannou, deceased the 24th November, 1850, wife of Charles Caroff"). Some inscriptions are shorter, as "Ici-Git Jeannet Prigent, Morte 1868." Some boxes are home-made and uninscribed. A few years' exposure to the weather soon causes the skull-boxes to fall to pieces, and the skulls then become quite exposed, and are seen to be full of vermin, such as spiders, wood-lice, and centipedes; snails also get inside the skulls to hibernate, and small wild plants grow from cracks and hollows.

The flat grave-stones in the churchyards are furnished at the foot with small depressions carved in the shape of a heart or cross, and these little depressions are kept filled with holy water. It is not uncommon to see the villagers coming from the churches with claret-bottles of holy water, from which, previous to prayer at the grave foot, they fill these little depressions. Several examples may be seen in the illustration. The figure at the back is a grave-digger; the woman in front is making woollen thread with a distaff and spindle.

The interior of the church at Guimiliau is full of pictures and gilded and painted images: there are several altars, all of the Renaissance period; at the time of our visit, garlands of flowers were hanging from pillar to pillar in the interior of the church in all directions. To students of the Renaissance, the churches of Brittany present great attractions, as the details of the architecture and ornament are elaborate, and show great study. Students of tenth, eleventh, twelfth, and thirteenth century work will find but little, although there are many vessels, ornaments, and small objects of great antiquity preserved inside of some of the churches of Brittany. W. G. S.

Dunstable.

THE BANK OF SWEDEN, STOCKHOLM.

WE gave last week the front and side elevations of this large building, in which the Legislative houses and the National Bank of Sweden are combined; we complete the illustration here by the elevation of the rear of the building, which is occupied by the bank, and plans of two floors of the latter.

The following are the references to the numbers on the plans:—

Entrance Floor of Bank.

1, 2. Bullion and Note strong-rooms.
3. Archives.
4. Reserved room.
5, 6. Bill-discounting offices.
7. Vestibule.
8. Corridor.

N.B. The un-numbered rooms in both the Bank plans are offices of secondary importance.

Ground Floor of Bank.

1. Consulting Room.
2. Passage.
3. Hand Printing Presses.
4. Steam Printing Presses.
5. Drying room.
6. Passage leading under the Drattninggata street to the lower floor of the Houses of Parliament, where remainder of offices are situated.

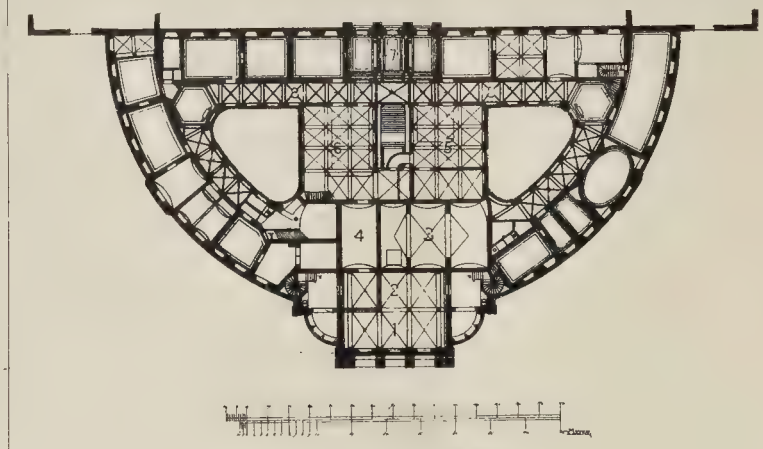
The hard and mechanical style of the elev
tions is not, of course, the kind of drawing w
like to see in our illustration pages, but the
are reproduced from lithographs from th
original drawings, and the Swedish architect
draughtsman is responsible for their style.
one of the most important new buildings in
northern capital the illustration is of interest
spite of the poor style of drawing, a matter
which England is certainly in advance of th
Continent.

UNIVERSITY COLLEGE LECTURES.

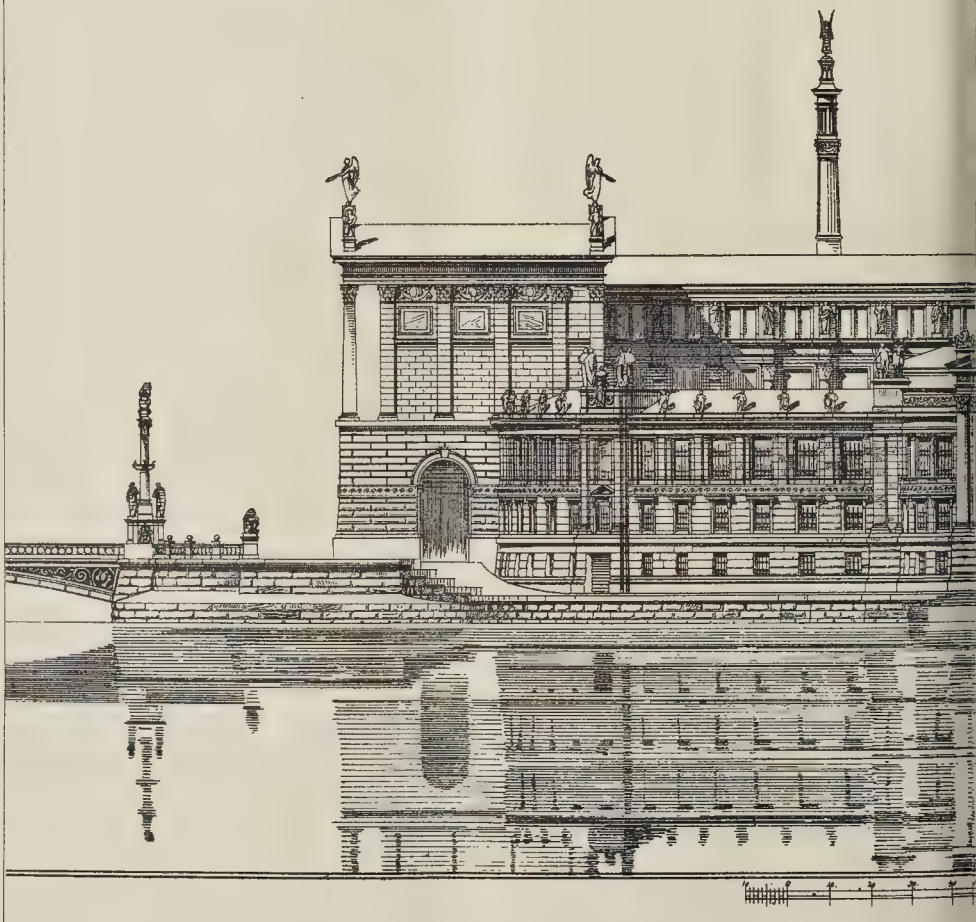
ON Tuesday, the 24th ult., Mr. Cecil H. Smith
gave the last of his lectures in the Britis
Museum on Greek Vases and Pottery. He spok
first of the excavations which had been carrie
on at the Acropolis of Athens. Among th
marble understratum of the Persian sack the
were found bases with four or five dedicatio
of certain objects to Athene by painters wh
were clearly to be identified with the men wh
painted the later vases, such as Nearchos. Th
habit of signing the vases begins to die o
about the time that the influence of the gre
painters, Polygnotus and others, began to
felt. These first practically raised painting
an art by itself. After 420 B.C. we have a fe
signatures, but these are in Southern Italy
Zenophantos appends to his signature the wo
Athenaios, as he worked probably near th
Black Sea, but wished to let it be known th
he was Athenian by origin. The great adva
tage we have in studying these vases from th
time of Pisistratus downwards is that
obtain a long, continuous line of paintin
influences, at least down to Phidias an
Polygnotus,—so little is otherwise known
Athenian painting. The sack of Troy, whic
is a representation repeated on many vases,
manifestly imitated from some original by
great artist. No trace of the drama is as y
found, the majority of subjects being Dionysia
scenes, &c., suitable for the circumstances
prosperity which marked Athens, described
Aristophanes as possessed of

"Peace, with wealth in her arms!"

Polygnotus flourished from 460–430, the be
period of the red-figured style. The vase
this time was decorated with one grand com
position, and as his paintings became known
their characteristics seem to have been copi
on the vases. He had but a small range
colours,—probably four,—and his compositio
were subjected to certain tectonic conditio
His perspective was only that of sculptu
relief, and his work merely decorative. As so
as painting lost its simply decorative charact
vase-painters no longer kept up with the high
art. The claim of Polygnotus to be a gre
painter lies in the æsthetic effect of his ind
vidual treatment of details; he was the paint
of what the Greeks called ἦθος, sculptural
idea, and possessing refined expression in t
gesture. He was followed, about 420,
Apollodorus, who was marked by a knowled
of *chiaro-oscuro* and a fusion of colours, wh
the work of Polygnotus consisted only of sim
broad washes on a white ground. Zeuxis da
from 400 B.C., and his style is described
Lucian. One work of his represents a fem
centaur suckling her young, while the m
centaur looks on; and from a mosaic we bo
a clear souvenir of this painter. The
painters had dealt formerly with gods
heroes or with daily life. A rough sa
attended on Dionysos, while the boy H
waited on his mother Aphrodite. From
time of Zeuxis, the saytr is shown playing
the goats, while Eros is not so associa
with the Goddess. It is said that Zeu
formed his idea of Helen from
combined charms of seven or five maids
Crotona. He painted Helen at her toilet
five maidens on each side of her, and
flying over her head. Parrhasius seems
represent quite the opposite pole; his subje
which are mostly gods and heroes, show
to have been under the influence of Euripi
and we know that he made designs for m
engraving vases, that those might serve
criteria for artists in the future. In the
century B.C. vases appear with a relief in
centre, and later on some whose whole dec
tion consists of metal and gilt. Mr. S
next referred to white lekythi. On one of t
the central scene is a mausoleum of
Oriental style; and the palpable aim is
æsthetic beauty of the figures in the red-fig
method. Soon we can trace the introduc
of fresh colours and shading; vase-paintin
losing its old idea of mere decorative pur

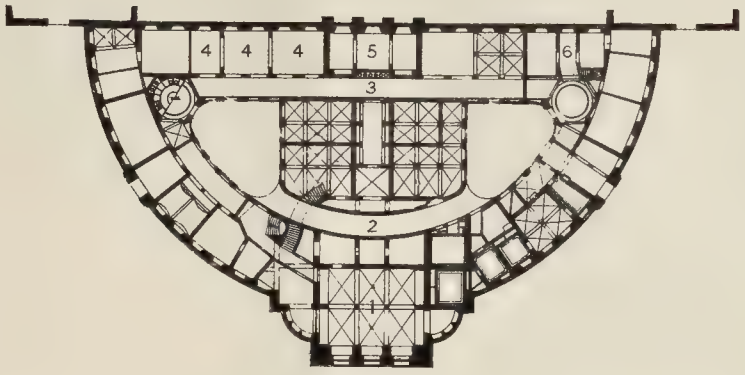


ENTRANCE FLOOR OF BANK



SWEDISH HOUSES OF PARLIAMENT AND

FAÇ



GROUND FLOOR OF BANK

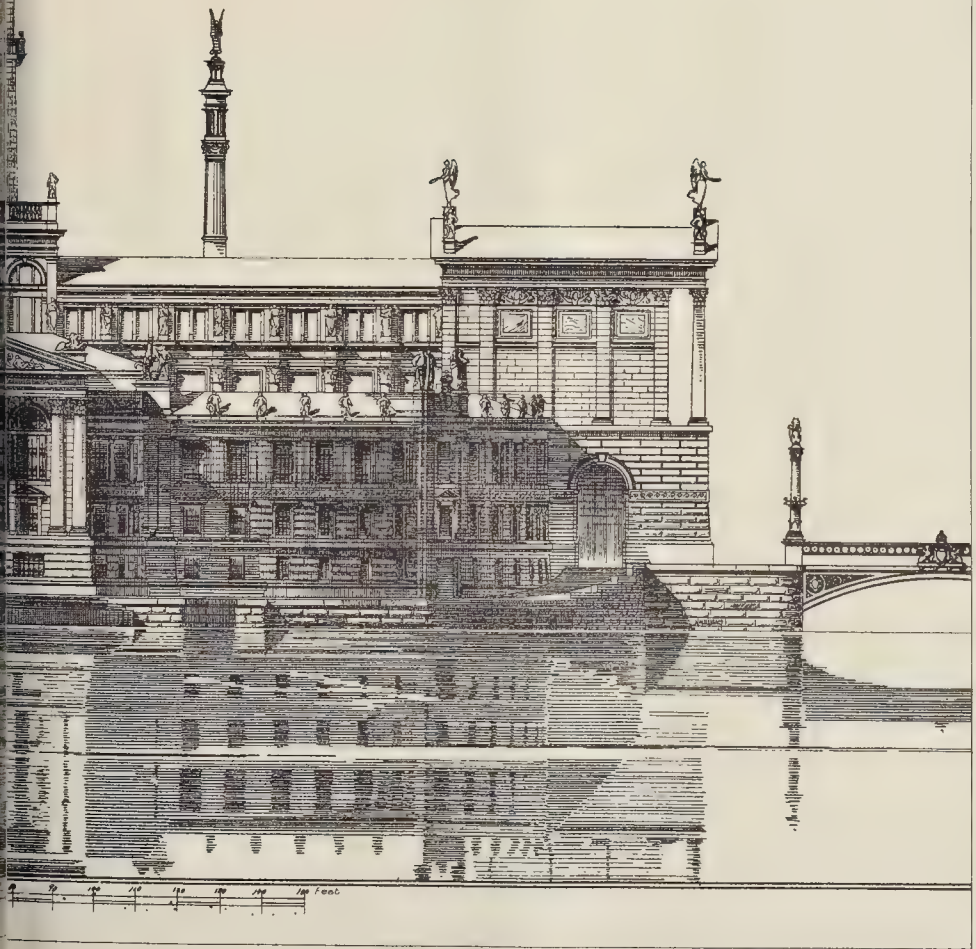


PHOTO THOS. SPARKES & CO. 23 MARTINS LANE CANNON ST. LONDON E.C.

EDEN.—Herr Helgo Zettervall, Architect.

GE.

he Panathenaic vases referred to in a former
cture were unchanged for two centuries; on
he side was Athene brandishing her spear, and
e combat-scene on the other. The reason
r there being no alteration here is that there
as a notion that these figures were of hieratic
haracter; and we have still the black figures
a red ground. These vases were either
ven away as prizes, or, as some think (and
at principally because the name of the
chon of the day is on many of them) kept as
oords of the games. On the same principle
e tetrogram remained unchanged in ap-
earance, lest the coin might not pass. Mr
ith next spoke of the taking of Athens by
emetrius in 307, after which no vase can be
finitely assigned to that city; the art passed
Italy and the Greek colonies there, chiefly
arentum, which was the great market of the
lonies; and the Tarentine style was peculiar,
though based on the old Athenian vase. It
d a special style of comedy—broad farcical
representation, the mode of Aristophanes
ving passed out of use. At Tarentum there
as also a continuation of the sepulchral
eatment, suggestive of the old idea of people
inging offerings to a tomb. The architectural
vance also began to make itself felt. The
ad person's figure was exaggerated and
tures of mourners were arranged on one or
o planes. The art of vase-painting seems to
ve either died a violent death, or expired
owly through the disturbed state of Italy
ring the second Punic war. The date of the
ll of Capua and Tarentum seems to correspond
th the end of the art.

RCHITECTURE.—A PROFESSION OR AN ART?

IN reference to the memorial on this subject
hich was addressed to the President and
uncil of the Institute a short time since, and
which we commented in our issues of the
n and 14th ult., pp. 184 and 203 respec-
ely, the following correspondence has taken
ce:—

"Royal Institute of British Architects,
March 5, 1891.

DEAR SIR ARTHUR,—The memorial addressed by
rself and others to the President and Council of
Royal Institute of British Architects, which was
eived at this office on the 2nd inst., was laid
ore them that day, and generally considered.
n reply, we are to ask you to be so good as to
ange with the other memorialists for a conference
the terms of your memorial, for which purpose
are to suggest that a committee of your number
y be appointed to meet a committee of our
ncil.—We are, &c.,

ASTON WEBB, Hon. Secretary.
W. H. WHITE, Secretary.

ir Arthur W. Blomfield, A.R.A."

"52, Berkeley-square, W., March 16, 1891.

DEAR SIRS,—In reference to the proposal of the
ncil of the Royal Institute of British Architects
hold a conference on the terms of our memorial
ween a committee of the Council of the Institute
a committee of the memorialists, we beg to
nk the Council for their offer to meet the memo-
ists, but we think it desirable to define our
tion more precisely before accepting their
tation.

We maintain that no one is entitled to be de-
ed an architect merely because he has answered
questions of an examiner in such subjects as
ay of examination, inasmuch as, without imagi-
on, power of design, and refinement of taste and
gment, he can have no true claim to the title:
these are qualities that cannot be brought to
test of examination. Consequently, we depre-
any attempt to make examination and diploma
ditions of admission to the pursuit of architec-
e, because a legislative sanction would thereby
ive to a false and delusive idea of the true
difications for the art.

o prevent misunderstanding we wish to make it
r that the kind of examination to which we
ect is a qualifying one, carrying with it as its
ect a diploma or certificate, or any recognised
inction. We fully admit the value and necessity
uch examinations as those made by a teacher of
work of his pupil in order to satisfy himself that
pupil has profited by his instruction.

he periodical review and correction of a
dent's work by his master is, of course, part of
y educational system. The examinations of the
itute are not of this kind, because it does not
th, and has no students.

he point on which we differ from the Institute
Mr. Gough's committee alike is that of a quali-
g examination, and its being made compulsory
hose who desire to become architects.

the Institute is so convinced of the value of a
ifying examination, and is so resolved to
tain it that they cannot entertain the idea of
g it up, we see no use in the conference to
which we are invited, and can only regret their
determination.

If, on the other hand, the Institute is disposed
to regard the matter as still an open question, we
shall be happy to confer with them.

We are, &c.

A. W. BLOMFIELD, A.R.A.	J. T. MICKLETHWAITE.
REGINALD BLOMFIELD.	EDWARD S. PRIOR.
T. G. JACKSON.	J. D. SEDDING.
MERVYN MACARTNEY.	R. NORMAN SHAW, R.A.
REGINALD BLOMFIELD, MERVYN MACARTNEY,	Hon. Secs.

The Secretaries, R.I.B.A."

"Royal Institute of British Architects,
March 24, 1891.

Dear Sirs,—Your reply of the 16th inst., signed by Sir Arthur Blomfield and others, to our letter of the 5th inst., suggesting a conference on the terms of your memorial, was laid before the Council of the Royal Institute of British Architects yesterday, when it received from them that careful consideration which is due to the distinguished architects whose names are attached to it; and the Council can only regret that its tenor appears to render futile any discussion such as was offered by them in the conference they proposed.

We are to remind you that the Institute examinations, which qualify for candidature for membership of the Institute, are held in accordance with the provisions of a Royal Charter and of by-laws made thereunder, which have been approved by the Privy Council, and from which there is no intention to deviate even if the power to do so existed. Indeed, the Council of the Institute believe that they will best fulfil their duty to the general body of members, and most surely advance the interests of architecture throughout the British Empire, by developing the examinations, which conduce in their opinion to the educational welfare of those entering the Institute,—an object that should command the sympathy, they venture to think, of all the memorialists.—We are, &c.,

ASTON WEBB, Hon. Secretary.
WILLIAM H. WHITE, Secretary.

Reginald Blomfield, Esq., M.A., and Mervyn Macartney, Esq., B.A., 52, Berkeley-square, W."

MELROSE ABBEY.

THE following is an abstract of a lecture delivered to the Edinburgh Borderers' Union, Edinburgh, on "Border Abbeys" (Jedburgh, Kelso, Dryburgh, and Melrose), by Mr. G. S. Aitken, on the 24th ult.:—

"We now reach the last abbey in our series. So much has been written in poetry and prose about its history and architectural beauty, and so thoroughly has the artist depicted its form from many points of view, that it almost seems superfluous to add a word to what has been so well done; but as the gleaner in the harvest-field by patient industry may gather a goodly sheaf, we may perhaps find something in that glorious building that has escaped the observation of the many pilgrims who have come from far and near to examine and study this precious shrine.

The abbey that we now see is not the building founded by David I. So far as we can ascertain no vestige of the original building remains. This mysterious disappearance of an abbey coeval with the other three we have been describing is an indubitable fact, for the style of the present building is one long subsequent in time to that which prevailed at the date of original foundation. It agrees with what is known as that of the Decorated period, and happily we are furnished with two fragments of evidence which serve to throw light on our mystery. *First* we learn that at the close of the wars between Scotland and England in the fourteenth century the church and monastery of Melrose lay in ruins, and that encouraged by the state of peace secured, and aided by a grant of 2,000*l.* from King Robert I. in 1326 (said to be equal to about 50,000*l.* at the present day), they were enabled to erect the present abbey in a state of magnificence that must have far surpassed the fabric of the twelfth century.

But it will naturally be asked, how is it that no part of the original was spared? The other three Abbeys passed through the same vicissitudes, and such parts as remain in these cases are linked on to the earliest period of their history. The answer that may be accepted is that, with the large sum promised, the Melrose brotherhood had an inducement that the other houses were not fortunate enough to possess, and, while we at the present day would be very scrupulous in removing old landmarks by destroying ancient architecture, the mediæval men had no such consideration for what had been done before, if it was not elaborate enough for the advanced architecture of their time. It has been already shown that the monks did not hesitate to pull down the ancient Norman presbyteries, and replace them by ornate Decorated or Perpendicular work, and so we may conclude they acted in this spirit in the case of Melrose, removing every visible part of the early work to the foundations.

And here we find our second fragment of evidence. If the plan of the nave be examined it will be observed that the north aisle is narrower by about 3 ft. than the south aisle, but that the whole width, including aisles, is approximately the *same* as the widths of Jedburgh, Kelso, and Dryburgh, with which it no doubt originally agreed in size. Our argument is this, that the monks, like reasonable men, while they discarded the original visible work, made use of the old foundations for the new work, but, wishing to have a more splendid church, *widened* their *nave* at the expense of the north aisle, in other words removed the pillar foundation of the north aisle further north, by this simple change sparing the greater part of their old foundations, and securing a larger and more magnificent church than the first one.

Our theory is confirmed by an examination of the north and south transepts, which are exactly the same width, within a few inches, as those of the other three abbeys, and, therefore, narrower than the new nave, which they crossed. The result is a crossing of an *oblong* form that also affected the tower above, which would be thus so far off the square. We may be sure this would not have been done if the monks had been building *de novo* independent of old foundations."

ARCHITECTURAL SOCIETIES.

THE ARCHITECTURAL ASSOCIATION (LONDON).—At a meeting of the Advanced Class of Construction and Practice, held on the 25th ult., Mr. W. Henry White read a paper upon "Technical School Planning." Mr. J. M. Brydon was the special Visitor for the evening, and drawings were kindly lent by Messrs. Alfred Waterhouse, R.A.; E. C. Robins, F.S.A.; and Messrs. Smith, Woodhouse, & Willoughby, of Manchester.

MANCHESTER ARCHITECTURAL ASSOCIATION.—A special general meeting of this Association was held at the Diocesan-buildings, on Tuesday last, for a discussion on the best means of preventing the effects of frost on plumbers' work, to which several of the leading plumbers of Manchester were invited. Mr. T. Chadwick, President, occupied the chair, and opened the discussion, which was continued by Messrs. Hodgson, Woodhouse, Cook, and other members. Mr. W. Jaffrey, plumber, and Mr. M. Ingram, engineer, replied to a number of points raised, and contributed some very valuable information. It was strongly recommended that all boilers should have safety-valves, and be fitted with a scouring or cleansing pipe, by which all pipes, boiler, and cylinder could be emptied when necessary. All pipes should be protected from the cold, and the overflows from cisterns which admit cold air, and cause the ball-cocks to freeze very soon, should be protected, or directed inside instead of out. The supply-cistern should be placed in a properly-prepared room, protected from the extremes of heat and cold, well-lighted, and easy of access, and not, as is often the case, in the roof.

EMIGRATION.—The April circulars and the new editions of the penny and other handbooks, with maps, issued to-day by the Emigrants' Information Office show the present prospects of emigration to the Colonies. A summary is hung up in every post-office in England, Ireland, and Scotland, so that intending emigrants have no difficulty in obtaining information. It is important to note that this is the best month in the year for emigrants to go to Canada, where, besides the usual demand for female servants, there is now a demand for farm hands and for men in the building trades, which is likely to continue during spring and summer. The Canadian Government now offers for the first time bonuses of 15 dols. to the head of a family, and half that amount to his wife and grown-up children, if he settles on land in the north-west or in British Columbia. In Australasia the harvest is now over, but there is still a demand for female servants, miners, navvies, farm hands, dairymen, ploughmen, bushmen, general labourers, and men who understand pruning fruit trees and nursery work. Such men and women will, under certain conditions, get free or reduced passages to Queensland and Western Australia. In South Africa, carpenters, masons, bricklayers, and other useful mechanics, navvies, and female servants are in demand, and may, under certain conditions, obtain reduced passages to Cape Colony and Natal.

COMPETITIONS.

Proposed New Banking Premises at Whitby.—The present banking premises of the York City and County Banking Company, Limited, at Whitby, being found too small, the directors have purchased a site in Baxtergate, near the centre of the town, and have selected the design of Messrs. Demaine & Brierley, architects, York, and Westminster, submitted in competition with two other firms of architects, for new premises.

Board School, Paisley.—The *Glasgow Herald* reports that at a meeting of the Paisley School Board on the 25th ult., Mr. T. Glen Coats presiding, the report of Mr. John Gordon, I.A., Glasgow, who had been asked by the Board to act as their arbiter on the plans sent in for the new public elementary school, was opened. It was found that Mr. Gordon had placed in the order given the plans having the following mottoes:—1st, "Streams of light from wall to wall," by Mr. T. L. Watson, Glasgow; 2nd, "A B C," by Mr. Henry Higgins, jun., Glasgow; 3rd, "W," by Mr. Robert A. Bryden, Glasgow. After considering Mr. Gordon's report, and examining the plans, the Board decided to accept Mr. Watson's plans, and to appoint him architect for their new school. It was also decided to give the premium of 25*l.* to Mr. Higgins, and the premium of 15*l.* to Mr. Bryden. There were altogether fourteen sets of plans sent in by architects in Paisley and Glasgow. The school, which is to accommodate 1,100 children, and will probably cost 10,000*l.*, is to be erected at the East-lane, Williamsburgh.

Books.

Ventilation: a text-book to the practice of the art of ventilating buildings, with a supplementary chapter on air-testing. By William Paton Buchan, R.P. London: Crosby Lockwood & Son. 1891.

The key-note of this book is to be found in the following sentence:—"The author has made many tests with numerous ventilators, but as yet has not come across one which beats his own one." In common, however, with several other tradesmen who have added to architectural literature what they are pleased to call text-books, but of which the principal text is, "Buy my wares," Mr. Buchan has given us much information, which, if not very new, is, at any rate, for the most part true, and has pointed out clearly and distinctly some of the most important of the vital principles of ventilation.

Mr. Buchan's "leading line" appears to be his "patent exhaust induced-current fixed ventilator," and the scope of his book, therefore, extends very little beyond the domain to which the use of such an apparatus is suitable, but the application of such apparatus and its concomitant requirements are adequately described, and thoroughly illustrated by diagrams of the various articles Mr. Buchan has for sale.

It is but fair to Mr. Buchan to say that amongst fixed ventilators producing an exhaust action by the utilisation of wind power "his own one" may certainly, with justice, claim a high place, both for logical and scientific design, and for efficiency of action. We are pleased to note also that Mr. Buchan admits, what many makers of such apparatus have in the past denied, that a "suck down" may and does occur with their use, and that the occasional down draught from them therefore requires to be provided against. This Mr. Buchan does by his "patent self-acting anti-down-draught and inspection valve-box."

In his first chapter, the author gives us once again the well-known facts of the composition of the atmosphere, its weight, and the causes and effect of the addition of an abnormal amount of carbonic acid. He also, very rightly, describes the diffusion of gases, and points out its important influence on the practical aspect of ventilation.

The author then proceeds to deal with the question of organic impurities in vitiated air, quoting numerous authorities, and emphasising the fact that, although the carbonic acid may be a convenient measure of impurity, it is the organic matter that is the most injurious component of foul air.

The chapter on "Gases and Germs," or rather on Biogenesis and Abiogenesis, is not of much value in respect to ventilation, but one can forgive a shrewd tradesman for thinking that a little scientific gas may help to buoy up a practical man's reputation.

We now come to some valuable chapters in the book, wherein Mr. Buchan points out some of the mistakes which have been made in the past in the arrangement of ventilating apparatus, chiefly in the matter of admitting cold fresh air at the top of an apartment. We regret, however, that Mr. Buchan should sully a good cause by some would-be humorous passages which are in the worst possible taste.

After pointing out the faults of bad arrangements, the author naturally proceeds to describe what he considers improved systems, dealing separately with inlets and outlets. The subject of inlets is well treated, as far as regards inlets suited to an exhaust system of ventilation, but there is one great difficulty in connexion with such a system as Mr. Buchan's with which he does not appear to have successfully grappled, and that is, the regulation of the temperature of the incoming air. As is imperatively necessary for a system of fluctuating activity dependent upon the velocity of the wind, he provides valves for the regulation of the amount of the air current, but the temperature of the external atmosphere will vary on different days, so that if the heating pipes be shows are adequate to warm the incoming air one day, they will be inadequate on another. This is a difficulty that can be obviated in a more satisfactory manner than by shutting off part of the fresh air supply, but how it is to be done does not appear in Mr. Buchan's work. This is the chief difficulty in the application of such a system as Mr. Buchan's, and unless it is overcome we cannot be in possession of the desideratum, which he thus rightly describes:—"The aim of good inlet ventilation may be summed up in a sentence, viz., a large or requisite amount of fresh air, to be admitted slowly, and of a temperature and in a manner so as to be both comfortable and safe, and, therefore, hygienic."

Mr. Buchan's description of improved outlets is an account of various ways in which different forms of "his own one" ventilator may be used, the efficiency of which would in many cases be greater if his ducts were more scientifically arranged.

In speaking of experiments with cowls, Mr. Buchan naturally sides with Mr. Hellyer against the famous "Kew tests." We therefore have to weigh the evidence of Messrs. Buchan and Hellyer, who have cowls to sell, against that of men like Eassie, Rogers Field, and Douglas Galton. There is surely a mistake in the statement that a "12 in. Boyle's ventilator drew up 37,558 linear feet a minute." That is a velocity of over 400 miles an hour!

The author's calculating formula is simply a rather indefinite rule of thumb for selecting the size of his own ventilator for any particular job.

Artificial or mechanical ventilation is dismissed in one not very long chapter, chiefly based on the late Professor Carnelley's Report to the Dundee School Board.

A chapter on the ventilation of drains is introduced to afford an opportunity of writing about "Buchan's traps"

The last chapter in the book is very refreshing and interesting. For it Mr. Buchan is indebted to Mr. John Foggie, F.C.S., and in it is well and clearly described the method of analysing and testing the purity of air as pursued by the late Professor Carnelley.

The Design of Structures, Bridges, Roofs, &c. By S. Anglin. London: Charles Griffin & Co. 1891.

The author of the above work has certainly succeeded in producing a text-book on the design of structures, which not only treats the different branches of the subject from a thoroughly practical point of view, but one which requires on the part of the reader only an elementary knowledge of mathematics. Throughout the work will be found a large number of examples, such as occur in the every-day practice of the engineer, all of which are fully worked out, many being solved both analytically and graphically.

In the early chapters of the book, the difference which should be observed between the words "stress and strain" is pointed out, and the meaning of elasticity and fatigue of materials explained. Attention is drawn to the experiments of Wöhler to determine the effects of varying and oft-repeated stresses, and it is shown that the factor of safety depends on the kind of load, as well as on the nature of the material. The properties of the chief materials used in structures such as timber, cast and wrought iron, and mild steel, are described, and such tests are given that will insure these materials being of suitable quality for the purpose to which they are applied.

A large portion of the work is devoted to describing the methods of working out stresses in all kinds of structures, from simple cantilevers to arches and continuous girders, but this subject has been so often and ably treated before that it is difficult to say anything very original concerning it. The student should, however, derive great assistance from the large number of practical cases which the author has carefully worked out to illustrate the methods adopted.

Sketches of Architectural Antiquities. By Vincent W. Voisey F.R.I.B.A. Eighty-two illustrations by a permanent process of photography. Bristol: James Fawn & Son. 1890.

This is an album of architectural sketches and measured drawings, reduced by photography from the originals. They show a great deal of industry on the part of the author, but perhaps would have been more useful for reference if they had not been reduced to quite so small a scale. The compensating advantage is that a great number and variety of subjects are got into a comparatively small album. The line drawings form the best portion of the work; the washed drawings appear to have been rather too loaded in working to reproduce well, and are consequently rather black and deficient in clearness. The sketches, we learn from the preface, were all made and completed on the spot, and not intended for publication. "They are freely interspersed with notes, details, sections of mouldings, and other things which may be of interest to architects, archæologists and others." The measured drawings are the really useful part of the collection. The author seems to have been aiming at a collection which might appeal to the unlearned as well as to architects. This is seldom satisfactory, and results in a rather heterogeneous collection of by no means equal value. Some very interesting pieces of old metal work are included. Among the measured drawings are a good set of Yatton Church, Somersetshire, which occupies sixteen plates, and would form the making of a good monograph on the church if produced to a larger scale. An elevation of one bay of Whitby Abbey, with a number of mouldings, forms another good page, also a geometrical drawing and a perspective view of the west front of Tewkesbury, with a section of the mouldings of the grand Norman arch; the whole is very correctly given. If the author had included more work of this kind there would have been a much more serious value in his sketch-book. As it is, the bulk of it is of the kind which does very well to lie on a drawing-room table as an ornamental book for visitors to turn over. In this light it is attractive, but it is hardly the kind of book which it is worth while for an architect to publish. The author has it in him to do something of more value than this.

Transactions of The Guild and School of Handicraft. Vol. I., 1890.

This volume of transactions, issued by "The Guild and School of Handicraft" in Commercial street, Whitechapel (why it claims to assume the definite article we know not), is a typical "æsthetic" literary production. It is covered with a wrapper of grocers' sugar paper, projecting an inch or two beyond the edges of the pages, which of course are left ragged and uncut. The printed page is filled up, where there would otherwise be a portion of a half blank, with rows of large and prominent black ornaments, which by no means beautify the page. If spaces in a page are to be filled up decoratively, it should be done with more delicate and less obtrusive and spotty work than this. In fact, however, the spaces left between paragraphs are better left blank, for the convenience of the reader, which is surely the first thing to be considered. They form a natural and immediately obvious index to the literary arrangement of the matter.

The contents of the book consist of reports of lectures given by Mr. Tadema, Mr. Rich mond, Mr. Stirling Lee, Mr. E. P. Warren ("Parlour Architecture") and others, contain much good reading and sensible advice, which would be just as useful and less irritating to read if it were not printed in so *outré* a fashion. The marginal notes, "Here the students gather round the table" &c. may be interest-

ds to the members of "*the* Guild," but ly to any one else. But the whole style of ssue is redolent of affectation.

rials of Edinburgh in the Olden Time. Sir D. Wilson. Edinburgh and London: & C. Black. 1891.

ave received Parts 3, 4, and 5 of this work h continues the sketch of events in the ical and social history of Edinburgh, npanied by illustrations of corners of old burgh, which are of interest as represent- hat has mostly disappeared or been altered recognition. The latter portion of Part 4 arked "Part II.," which we presume means II., and which treats of "Local Antiqui- and Traditions" commencing with "the e," of which however the account is rather re.

Trigonometry of One Angle. By the Rev. B. Lock, M.A. London: Macmillan & Co. 91.

RE are many students who have not suffi- l leisure to study a comprehensive treatise igonometry, but who should be able to find to obtain an elementary knowledge of the ct, such as is given in the above little book, h would enable them to read works on anics and many other similar sciences, to ughly understand which it is necessary to quainted with the properties of "sines and es." The author treats his subject in the simple and complete manner that has d his many other text-books to be so y appreciated both by teacher and pupil, quently there is very little difficulty in ering the rudiments of a branch of mathe- s which is of great practical value to those ged in the architectural and engineering ssions.

TRADE CATALOGUES.

SSRS. Richard Moreland & Son, engi- , of Old-street, St. Luke's, have issued a very l and well-got-up illustrated catalogue of ructional work in steel, wrought-iron, and iron. It contains sections, dimensions, hts, and strengths of rivetted steel and girders, roofs, columns, and stanchions, roof doors, flooring, &c. A useful feature is catalogue is the provision of a number ank leaves at the end for sketches or memo- , calculations, &c.

ssrs. J. Sagar & Co., saw-mill engineers, of ax, Yorks, send us two small catalogues of -working machinery, containing illustra- of many compact and ingenious machines, ble for large or small workshops, or for use orks in progress.

e St. Pancras Ironwork Company, of St. ras-road, have issued an illustrated cata- of pavement and floor lights, stall-boards, r-flaps, coal-hole plates, &c.

ssrs. Longden & Co., of the Phœnix dry, Sheffield, have sent a small descriptive hlet of their "Sunbeam" steam and hot- radiators for warming buildings. These tors are made on Mr. Leeds's patent, and ar to be well worth the attention of itects.

. Frederick Betts, of York-street, London- Southwark, sends us a comprehensive gue of builders' ironmongery and hard- including stoves, grates, and ranges of all , mantels and over-mantels, railings, s, sanitary fittings, locks, door furniture, It is very fully illustrated and is well ed and got-up.

ssrs. G. B. Kent & Sons, of Great Marl- gh-street, have issued their "Painting- List" for March, 1891. It includes brushes ools of all kinds required by the painter decorator. The productions of this house, was established as far back as 1777,—or ears ago,—have long been known in the for their excellence.

Charles Carr, of the "Woodlands" Bell Brass Foundry, Smethwick, sends his Catalogue" for 1891, which contains iptions and illustrations of church, school, actory bells, fire-alarms, &c. The catalogue contains illustrations of brass-founders' les, moulding-tools, plumbers' brasswork, nd will be found useful for reference.

ROW.—The *English Illustrated Magazine* for contains an article on Harrow School, con- ed jointly by Dr. Butler, Mr. Percy M. ton, and Mr. P. H. Martineau, with illus- sketches by Mr. C. T. Watson. The sketches ther slight, and hardly do justice to the build- presented.

Correspondence.

To the Editor of The Builder.

BYZANTINE ARCHITECTURE.

Sir,—Mr. Ferguson [see his letter, p. 233, *ante*] doubts the accuracy of my use of the word "rubble" for the filling in of Roman walls, and I think it would have been more prudent to have defined the sense in which I used it. At the time of writing, no other word occurred to me that would distinguish it from concrete, in the present acceptation of the word. Concrete now means some hard substance or substances of graduated sizes thoroughly mixed, wet or dry, with some cementing material, and then thrown into trenches or filled in between boards or walls. Some years ago, tesseræ, small triangles, and squares of pottery, intended for mosaic, but for which there was no demand, were used for this purpose, and were mixed with lime or cement and sand. Supposing a bed of concrete formed in this way were cut through, the pieces of pottery would be found lying at every conceivable angle, and an intelligent observer would come to the conclusion that the mixture, when soft, was thrown in; but, as far as I have observed, Roman filling was never like this, but always in courses more or less horizontal. As I had not much time, when I was last in Rome, to bestow on this investigation, I asked Il Cavaliere Bongioanini to give me his experience, and he said, "it was always 'coursed.'" Now let us see what M. Choisy says in his "Art of Building Among the Romans." After speaking of rammed concrete, in which pieces of stone are found with the most varied orientation, he says (p. 18), "The ordinary masonry, on the contrary, has none of this irregularity; it is a very uniform super-position of courses of mortar from 3 to 4 centimètres at the most, which alternate with courses of broken stone. All the fragments are laid flat and on their quarry bed, and if occasionally some bricks or broken pottery are employed instead of stone chips, the orientation of their faces following the horizontal course always shows itself in complete evidence. A widely-spread opinion consists in seeing in this common masonry a sort of concrete,—*i.e.*, a mixture prepared beforehand and employed by the running of stone chips and mortar; but the invariable orientation of the fragments of stone, which always turn their longest dimension horizontally, excludes, I think, this supposition."

It would not be fair to trespass on your kindness by more long extracts, but M. Choisy gives another reason for his conclusion, that the Romans did not care to incur the expense of a preliminary mixing, and showed their admirable organisation by keeping one gang of labourers to shovel on the mortar on which another gang laid the course of stone chips or brick-bats. I am inclined to believe that Vitruvius speaks of this method in his description of the filling in between walls (Lib. 2, cap. 8, para 4. Edit. Leipsig, 1869).

I came to the conclusion that the facing of triangular bricks was to serve the purpose that boards now serve in forming concrete walls above ground, *i.e.*, that it held up the soft mass of filling to a certain height without bulging, and that just before the height was reached at which the bricklayers' experience told them the walls would bulge, a course of whole bricks was carried through the wall. We know that when the Romans built walls of this rubble in trenches, the work was rammed with wooden rammers shod with iron (Vit., lib. 8, cap 6, para 14), but the mere fact of the brick-bats or stone-chips being level in ordinary walls above ground seems to preclude the idea of their being rammed.

There are two distinct methods of constructing vaults shown in M. Choisy's work, that in which a net-work of bricks on edge was used, and that in which there was a skin of flat bricks, although in this last system brick ribs were often employed as well at fixed distances, and for groin points.

When a student in Italy I once saw a room being vaulted by means of a flat brick skin, about 1½ in. thick; it was a room probably of 30 ft. by 18 ft., for I have lost my sketch. Narrow wood turning pieces were used, about 6 ft. apart. The two bricklayers began with a brick on a turning piece, and each brick was jointed in plaster of Paris, and so great was the confidence of the bricklayers, that they knelt on this skin, just set, to continue the vault; the spandrels were strengthened by small arches the reverse way, and the men told me that the whole would be filled up level with concrete, and a rammed mosaic floor be put on the top. The work was called "a la volterrana."

We are greatly indebted to Professor Middleton, Professor Baldwin Brown, Messrs. Chipiez, Perot, and Dieulafoy for all their interesting and important discoveries, but I think we should not withhold our praise and admiration from M. Choisy, the original discoverer of Roman and Byzantine methods of construction, whose first labours were mentioned by Viollet le Duc, in his Voûte article in 1868 ("Dictionnaire Raisonné"). As far as I know, no one ever dreamt of these methods before him.

G. Aitchison.

The Student's Column.

VENTILATION AND WARMING.—XIII.

ARTIFICIAL VENTILATION.

BEFORE illustrating the use of the formulæ we have been investigating, it will be well to give some attention to the principles of artificial ventilation, to which, as well as to natural ventilation, our formulæ are applicable.

By artificial ventilation is meant, as already mentioned, that form of ventilation in which movement of the air is produced by the consumption of mechanical power or artificial energy.

The means by which artificial energy is developed for the purpose of artificial ventilation are many and varied, while their application admits of a still greater diversity of treatment.

The apparatus employed may be classed under four heads—heat, fans, pumps, and jets. These may be arranged in two ways, either for the purpose of extraction or for that of propulsion, and these may, of course, be used either separately or in conjunction with each other.

The former of these methods was and still sometimes is called the "vacuum" method, on the supposition that, by the extraction of the foul or vitiated air, a partial vacuum is produced and that the traditional abhorrence of nature for such a condition caused the inrush of fresh air to fill the vacuum. Similarly the method by propulsion was called the "plenum" method, because by the forcing in of fresh air, the space was assumed to become more full.

Each of these methods has its advantages and its disadvantages. The chief advantage of the extraction or vacuum method is that it can usually be so applied as to minimise the cost of any particular scheme of ventilation, and the naturally high temperature of vitiated air can be utilised to assist the ventilation. Its great disadvantage is that the fresh-air inlets being not under complete control, draught is very liable to occur when this method alone is adopted; indeed, in this respect artificial ventilation by extraction stands on a level with natural ventilation, which, as we have already seen, is especially prone to this evil.

With the propulsion or plenum method, the inlets are completely under control if properly arranged, and it is accordingly easy to regulate the air currents to such temperature and velocity as shall escape the probability of draught. The outlets are in this case, however, not under absolute and complete control, and occasionally trouble may arise from this source, though with far less probability than in the case of the inlets in an extraction system.

There can be no doubt that for a thoroughly reliable and easily controlled system of ventilation, a combination of the two methods must be resorted to. The fresh air must be propelled into the apartment, and the foul air extracted, both by artificial means.

Of the various apparatus employed to produce movement of the air in artificial ventilation, the oldest are applications of heated columns of air. This heated column of air may be produced by a variety of means, by furnaces, gas-burners, steam-coils, or hot water. As the efficiency of any heated column of air is, as we have seen, dependent upon the difference between its temperature and that of the external atmosphere, it is evident that without elaborate arrangements for raising or lowering the temperature of the heated air column, and constant supervision and attendance, the action of such an apparatus must be fitful and irregular. With furnaces it is almost impossible to accurately regulate the temperature of the heated air column, and with the other appliances it is always more or less difficult. Irregularity of action is therefore usually the great dis-

advantage of ventilation by heated columns of air. Such systems are also apt to be costly when applied to any large scheme, though they are sometimes advisable for small operations, and especially as an adjunct to an application of natural ventilation. As a general rule, also, these systems are only available for ventilation by extraction, or in conjunction with the method of propulsion.

Fans are probably the most useful and the most powerful means of producing artificial movement of the air we have at our command. Their variety of form is extremely great. It has been stated, and the statement is probably not beyond the truth, that over 6,000 different forms of fans have been made and used for ventilation. The primary data required for the design of a fan are the amount of air to be moved, the pressure at which it is to be delivered, and the rapidity of action of the fan. Some fans are designed to deliver a large quantity of air at low velocity, others a small quantity at high pressure, and so on. Some are more particularly suitable for extraction, others for propulsion, some for use with a considerable length of ducts, others only where the ducts are short. So considerable a subject will therefore require to be treated in a separate chapter.

Fans may be driven in a variety of ways,—by steam-engines, by wind, by water-power, or by electric motors. They may be placed near the point of entry or extraction of the air or in a central situation. The determination of the actual arrangement will therefore be dependent on the circumstances of each particular case. What is admirable in one instance may prove quite the opposite in another. Judgment and consideration are therefore of the highest importance in the use of fans, in order that the best form, the most suitable situation, and the most economical method of driving for any particular case may be ascertained and employed.

Pumps for forcing in fresh air, or for extracting foul may be used as ventilating agents, and have been so utilised in the ventilation of mines, especially on the continent. For the ventilation of buildings they are hardly so suitable, and, practically speaking, are seldom employed.

Jets for producing air currents are of three kinds; steam, compressed air, and water. Their efficiency depends principally upon the degree of pressure at which the jet issues from the nozzle, while the form of this jet should be designed with reference to the space in which it acts, so as to produce the maximum of effect by a conical or fan-like form of the expanding fluid, suitable to the space in which it develops. All these jets are apt to be noisy in action, though those of compressed air are less so than the others. They are more generally employed as means of extraction than of propulsion, although they can be employed for either purpose, the water and steam jets being, however, subject to the disadvantage, when used to force in fresh air, that the air is moistened to a considerable extent. This may, of course, in certain cases, be an advantage instead of a disadvantage, but, as a general rule, for English practice, it means increased expenditure of heating power.

With the powerful means at our disposal for producing air currents, it will be readily understood that artificial ventilation, in some form or other, is the only satisfactory method of ventilating.

We can arrange for complete and immediate control of the amount of the fresh air supplied, its temperature, and its degree of moisture.

We can also cause our air currents to take any direction we please; indeed, many buildings have been ventilated by a downward current, the fresh air being brought in at the top of the apartment, and the foul air extracted at a lower level. This cannot be recommended for general adoption, as the lower strata of the atmosphere, in which the inmates are living and breathing, must of necessity be the most impure of all the air in the room, instead of being the least vitiated as it should be. With artificial lighting, the electric light excepted, the evil would be intensified to an almost unbearable degree in the majority of instances. In any application of natural ventilation, or with a small extent of air change, such a method is certainly always to be avoided.

The Proposed New Police Buildings at South Shields.—The Local Government Board has, it is stated, signified their intention of sanctioning the loan of 17,000*l.* to the Corporation of South Shields, for the purpose of erecting new police buildings. The loan is subject to an alteration in the plans rendered necessary by the sewerage works.

OBITUARY.

Mr. Edwin Fox.—Mr. Edwin Fox, founder of the firm of Edwin Fox & Bousfield, died on Monday last. Mr. Fox was born in the year 1820, educated at the Philological School, and, after having been articled to an estate agent at the West-end, commenced business as an auctioneer and surveyor in Coleman-street, being soon afterwards joined by Mr. Bousfield, and the firm was further augmented fifteen years ago by the accession of Mr. Fox's eldest son as a partner. Mr. Fox died at his residence, Heatham House, Twickenham, of inflammation of the lungs, after less than a week's illness.

Mr. J. Bladwell.—Mr. Joseph Bladwell, a member of the Bath Town Council, and a large builder and contractor, died on the 22nd ult., after a short illness. Among his largest contracts were the restoration of the Abbey, St. Andrew's Church, St. Paul's, St. John's and St. Mary's Catholic Churches, the Grand Pump-room Hotel, the National Provincial Bank, Manvers'-street Baptist Chapel, &c. He was sixty-four years of age.

GENERAL BUILDING NEWS.

Proposed New Sick Children's Hospital for Edinburgh.—A "communicated" paragraph in the *Scotsman* of the 25th ult. informs us that the directors of the Royal Edinburgh Hospital for Sick Children have resolved to erect a new hospital upon the site of the present one. The present building, not having been originally intended for a hospital, is wanting in many of the modern conveniences which are now considered really requisite for such institutions, and the work of the hospital has outgrown the building. The directors feel, therefore, that the time has arrived when a new hospital should be built equal to the requirements of the city and the calls made upon it from the various parts of the country. Anxious consideration satisfied the directors that to meet thoroughly the public wants, and to admit of the instruction in children's diseases which such an hospital affords, the institution must be located as nearly as possible to the centre of the town. Before deciding to build on the present site the directors made full inquiry, but could not find any site available so well adapted and so central as the present. They have had the present site thoroughly examined, and are advised that a building can be constructed in every way suitable, not only as regards accommodation, but as regards light and air and sanitary conditions. Mr. Washington Browne has been instructed to prepare plans for the proposed new building.

Nazeing Church, Essex.—The parish church of Nazeing, Essex, is now undergoing restoration under the direction of Mr. Walter F. Lyon, architect, of Craven-street, Strand. The building consists of nave, north aisle, chancel, and a fine brick west tower. The latter, with the aisle, appears to have been built in 1631, which date appears on the aisle wall on the nave side. This date may possibly allude to the restoration of the roof only, which, though good, is not Mediæval, having arch-moulded principals, which are at present much disfigured by plaster work. The aisle arches are Perpendicular, of a debased character, possibly built in Perpendicular times, but more probably, judging from the roughness of the style of work, carried out in 1631, the date on the walls. There are some good Perpendicular three-light windows in the chancel, and one very good Decorated two-light window in the nave.) The whole church is in a very bad state, disfigured by bad reparations which cannot be called restorations. The chancel arch is of cement in a degraded Batty Langley style, the walls throughout are in a sad state of dirt, the coign stones of windows being concealed by plaster and the filth of ages. There are a few very fine oak seats with boldly-carved ends, almost Italian in their character. The whole exterior is a terribly mutilated conglomeration of flints, plaster, odd bits of stone, &c., the coign stones being concealed by cement. There is a very fine wood porch of the late Decorated period, with very good open timber, well-moulded work in a deplorable state of repair. This really beautiful porch appears to have been brought from somewhere else, as the roof cuts across the arch of the church door. It is proposed just now,—funds being scarce,—to build a new vestry and organ-chamber connected with the aisle and chancel by arches, to put a Decorated chancel arch of stone, to open out all the roofs, and to re-plaster the inner walls, exposing the stone dressings to the different openings. The work is being done by Mr. J. A. Hunt, of Hoddesdon.

The New English Presbyterian Church at Llandudno has just been completed, at a cost, including schoolroom, of about 5,200*l.*, and was opened a few days ago. The plan is arranged with circular pewing, fixed in an isocoustic curve, which incline with the floor towards the pulpit; and the chapel being in one span, piers and columns are dispensed with, which enables the minister to be seen and heard by the whole congregation. Ample means of egress are provided by the entrances in Chapel and Gloddoeth-street, leading to tiled and parquet-floored porches and vestibules, the latter being constructed so that invalids may be conveyed with ease in their bath-chairs to the church, where accommodation is provided. Revolving-shutters i arched openings divide the church and school which may be thrown into one on crowded occa sions. The external walls are built of a dark local stone, with Cefn stone dressings, and the angles c the church are constructed circular, to assist th acoustic properties. The style of the building i Gothic. The organ-chamber is placed at the ex treme end, and projects from the main building The roof is of a conical shape, with the timber converging to the centre, forming an apex, on whic is a slated octagonal flèche. The ceilings ar panelled with moulded, decorated, and gilde ribs, and are coved at the eaves. The interior i fitted up in pitch-pine. The church is lighted wit "Stott Thorp" patent coronas and gas-governor and is heated on the high-pressure, small-bor system, fixed by Mr. Renton Gibbs, of Liverpoo Fresh air is admitted through inlet shafts, and thi foul air carried away through decorated and orne mental ventilators fixed in the ceilings attached t shafts that are connected to a large air-pump (Boyle patent) ventilator constructed in the flèche. Th builder is Mr. W. H. Jones, Llandudno; the archi tect is Mr. T. G. Williams, of Liverpool.

The New Mansion-House of Gosford, N.B.—On the 21st ult. the Edinburgh Architectural Association visited the new mansion-house o Gosford, the property of the Earl of Wemyss, whic was completed a short time ago. The *Scotsman*, i reporting the visit, says it is true that there ha been within the Gosford policies since the beginnin of the present century a "new" mansion-house, th erection of which was originally embarked upo many years earlier by the present Earl's great-grea grandfather. This house, designed by the brother Adam, was completed in 1803, and in due course th valuable collection of pictures belonging to th house of Wemyss was transferred from the ol house,—now demolished,—to that building. Soo after the pictures had been hung in their ne quarters, however, an apprehension arose that th building was damp in consequence of sea-san having been used in the mortar, and lest the should be damaged the collection was removed agai to the old house, and the new mansion, partiall demolished, remained tenantless. It is this build ing which Lord Wemyss has, at a great outlay o money, restored and worked into a palatial an complete mansion-house. The whole reconstructio was carried out to the designs and under the direc tion of Mr. William Young, architect, London. I addition to the internal reconstruction of th central portion of the original building which re mained, new wings have been added on the nort and south ends. At the south end of the building which, including the wings, is in length 341 ft., an entrance court-yard enclosed by an ashla panelled and pilastered stone wall, correspond ing with the architecture of the house; an there is a similar court-yard on the north side known as the kitchen court-yard. The groun floor story is of rustic stone work, and on th west,—the sea,—and east,—the garden,—fronts o the original building is an arcading of a simila character extending about 10ft. from the old wall and forming a *piazza* on the ground level, and o the principal floor a broad terrace connecting th two wings. From this terrace, to which the prin cipal rooms open, charming views are obtaine westward of the Firth of Forth as far as the Fort Bridge, while on the east side there are delightf vistas of the gardens and ponds which are a feature of Gosford policies. In the centre of the latte front is a grand flight of stairs, 38ft. in length giving access to the gardens. The exterior of th sea-front of the central building is treated as Corinthian order, extending the whole length of th wall above the terraces, with double pilasters a the ends and engaged columns in the centre Between are large arched windows with a mino ordinance of the Ionic order. In the centr is a pediment over which, springing fro an octagonal base, rises a dome, th outline of which must be familiar to all who hav enjoyed the view of Aberlady Bay from the Calto Hill of Edinburgh. The Ionic order is carrie through the new wings, which have a broken an picturesque outline, and the design adopted is suc as to give to the whole composition a pyramid form. The entrance is at the southern end of th house from the main avenue, and through a cou enclosed by ashlar walls, designed in character wit the architecture of the house. Passing through a outer hall—in design quiet and simple—entrance obtained to the magnificent staircase hall, whic is the feature of the interior of the mansion house. The lower story of the hall is su rounded by solid walls, panelled in Caen sto and alabaster,—broken only by three doorwa with alabaster architraves and over-doors ar two niches for life-sized figures. On th wall for a base rises an arcading of alabaster a Caen stone, which extends around the four sides the first floor. Facing the entrance door is an ov alabaster arch, resting on similar clustered colum and pilasters. A double marble staircase, startin on each side of the hall, is carried over this arch, in treatment not unlike the Rialto Arch at Venic —and meets in the centre, while inside the arch a fine Italian chimney-piece in Istrian stone. T balustrade which extends up the staircase and co tinues round the first floor is of alabaster, with be

nd capping in Caen stone. On the ground floor the all is 38 ft. by 48 ft., but on the first floor it opens p by the arcading,—behind which extends a corridor verlooking the hall,—to 56 ft. by 70 ft., with a eight of 45 ft. from the floor to the centre of the ome. This arcading is formed by a Corinthian ain order in Caen stone, 20 ft. high, each side eing divided by pilasters into four bays, and the nds into three bays. Each bay is again subdivided y a minor ordinance of the Ionic order into three, y a Venetian arch and side-openings formed with labaster columns, pilasters, archivolt, and inlaid labaster spandrels. A rich entablature in Caen tone completes the arcade, and above this springs bold cove panelled and enriched in canvas plaster ork. The ceiling is thence brought into the form f a circular dome, all in enriched canvas plaster. y the marble staircase is reached the principal oor, which contains the whole of the reception and ving rooms, as well as the family bedrooms and ost of the guests' rooms. The picture-gallery, hich is first entered, is 63 ft. long by 20 ft. wide.

Proposed Restoration of St. John's Church, erth.—A meeting of the General Committee ppointed in connexion with the restoration of St. ohn's Church, Perth, was held in the Commissioners' Hall, Perth, on the 26th ult. The eeting approved of the scheme prepared by the ub-committee, and agreed to issue to the public circular along with a plan of the scheme. The stimated cost of Mr. A. Heiton's plan was set own at 10,000*l.*

Higher Grade School, Portsmouth.—At the eeting of the Portsmouth School Board on the ith ult., the School Management Committee commended the acceptance of Mr. W. Learouth's tender, at 9,704*l.* 10s. 7d., for the erection the new Higher Boys' School in Victoria-road orth, and the appointment of Mr. Henry Lawnce, as clerk of the works, at a salary of 3*l.* 3s. r week. Mr. Lawrence was clerk of the works at e new Town Hall.

Proposed New Church at Newlay.—According the *Leeds Mercury*, the plan of Mr. Fraser for a w church to be erected at Newlay, in connexion th Bramley Parish Church, has been unanimously ccepted by the committee. It provides for 212 airs in the nave, twenty-eight seats in the chancel, o vestries, and an organ-chamber. It is proposed erect the church on a site between the canal and e Newlay station apjoining Pollard-lane.

Centenary Hall of the Masonic Institution or Girls, Wandsworth Common.—The Centenry Hall of the Masonic Institution for Girls, Wandsorth Common, and a new wing containing a nture theatre, six class-rooms, governesses' room, d six dormitories, were opened by the Prince of ales on the 12th ult. The Centenary Hall is in e style of the transition period between the late dor and the Elizabethan. The side walls are coaded, and a wall has been built between the treme points of the buttresses, leaving seven ep recessed alcoves on each side of the hall. gh up in these alcoves a floor has been serted; the buttresses have been perfo-ed, and in this way a gallery has been rmed which affords a complete promenade und the hall. The seventeen windows with hich the hall is lighted are all of stained glass, the signs being formed of the arms and crests of dges and individual Freemasons who have been ong the most generous donors to the institution. l the locks, with master-key arrangements, gether with door furniture and brass lock plates, re supplied by Mr. James Hill, to the architects' ecial designs. The new Centenary Hall is also ted with Hill's patent fanlight-openers to all the ndows. The order for the sixteen large and ecially-designed brass and copper gaseliers was o entrusted to Mr. Hill. The architects for the w wing were Mr. H. A. Hunt and Mr. Ralph utton, and the architects of the Centenary Hall re Messrs. H. A Hunt and F. G. Knight.

SANITARY AND ENGINEERING NEWS.

Congress of Hygiene.—The Council of the ciety of Arts, acting under the provisions of the njamin Shaw Trust, have offered two Gold dals, or two prizes of 20*l.* each, to the Executive mmittee of the Congress of Hygiene and Demo-phy, for any inventions or discoveries of date sequent to 1885, exhibited at or submitted to the ngress, and coming within the terms of the Trust. der the conditions laid down by the donor, these es are to be offered for new methods of obviating diminishing risks incidental to industrial occuions.

Kings Norton Sewerage.—The Rural Sanitary thority of this Union, at its meeting on March h, received, approved, and adopted a scheme for ling with the sewage of Northfield and Kings rton, prepared by Mr. Robert Godfrey, Assoc. Inst. C.E., Engineer and Surveyor to the hority. The scheme, which, with the purchase and, will cost about £10,000, has been favour-y reported on by Mr. E. Pritchard, M. Inst. ., to whom the Rural Sanitary Authority rred it. Application is to be made to the Local ernment Board for the necessary sanction and at once.

Birmingham Water Supply.—The Birmingham poration recently called in Mr. Mansergh to consult with their own engineer as to the future sources of water supply, the present demand having arrived very closely to the available maximum from local sources. In accordance with his report, the Water Committee have resolved to recommend a scheme for the construction of reservoirs to impound the waters of the Elan and Claerwen in Merionethshire, tributaries of the Wye, and to bring the same to Birmingham by a conduit, from which supplies will, probably, be afforded to other towns on the way. The estimated cost is 4,000,000*l.* sterling.

FOREIGN AND COLONIAL.

France.—A Franco-Belgic hospital has been opened in rue Championnet, Paris, open to members of both countries.——The Château de l'Etang la Ville, which in the seventeenth century belonged to the famous Chancellor Séguier, is for sale.——MM. Le Seneschal de Kerdreoret, Couturier, Mascotte de Guivière, de Champeaux, Laboulaye, and d'Argence, have been appointed painters to the Ministère de Marine.——The landscape-painter Edmond Yon is to have an exhibition of his paintings, pastels, &c., at the Georges Petit Gallery on the 7th, 8th, and 9th of April, and they are to be sold on the 10th at the Salle Drouot.——M. Eugène Rigaut, former architect to the Post and Telegraph Department, has been appointed by the Government as architect to the Ecole de Pharmacie, in place of the late M. Charles Lainé.——There is talk of making near Dinard a large promenade like the Bois de Boulogne, to be connected with the town by a grand avenue.——The Minister of Public Works has just opened a new line of railway from d'Estrées St. Denis to St. Just and to Froissy.——A public subscription is to be raised for a monument to M. Meny, Mayor of Belfort during the seige of 1870.——A decree of the President has authorised the erection, in the Commune of La Brède, of a statue of Montesquieu. The sculptor Pierre Granet, of Bourdeaux, is commissioned to execute the work.——An International Exhibition of machinery, electric plant, and chemistry, is to be opened on May 15 at Toulouse, to close in September.——The Chair of Architectural History at the Ecole des Beaux Arts is vacant by the death of M. A. Lenoir. Architects desiring to enter as candidates for the post have to send in their demand to the Ministry of Public Instruction before April 10.——M. Felix Régamey, of Paris, has been commissioned by the artistic club of Brussels to prepare an exhibition of paintings illustrating the art of fencing.——Mdme. Anselma Lacroix, a Parisian artist, has just finished for the Salle d'Athenée, at Madrid, a fine ceiling painting, symbolising Eloquence, Peace, and the Fine Arts. The design is accompanied by two pendentives, one representing Truth and Ignorance, the other Poetry and Science.——The sculptor Frétigny, Professor in the Fine Art School of Marseilles, and much esteemed there, is just dead.——The Church of Etrelles near Vitré has been destroyed by fire, the bare walls only being left. It was only very recently restored.——It is announced that M. Charles Garnier has resigned the position of architect to the Church of Sacré Cœur at Montmartre, which he had recently accepted.——M. Theodore Ralli, pupil of M. Gerôme, has been named President of the Committee of organisation for the first picture exhibition to be held in Cairo.——As we announced, the château of Nohant was duly put up for sale, but as no purchaser presented himself, the property of George Sand remains in the hands of her heirs for the present.——M. Bienvenüe, "Ingénieur ordinaire" of the city of Paris, has been created Ingénieur-en-chef, and his former post filled by M. Widmer, Ingénieur des Ponts et Chaussées, who executed the harbour works at Havre.——An old sculptor in wood, M. Joseph Keller, has left his fortune to the city of Paris in trust for the foundation of an annual prize, to be called the "Prix Keller," to the best pupils issuing from the professional schools in Paris.—— The Ministry of Public Instruction and Fine Arts has ordered the immediate undertaking of the necessary repairs to the church of the Madeleine of Vézelay. The architect of the "Monuments Historiques" for the Department of the Yonne has been urging every year the dangerous condition of the church. It is to be hoped that the work will be confined strictly to such repairs as are necessary for the stability of the structure.

Berlin.—At the "Landesausstellungs-Park," in the Exhibition buildings of which the International Art Exhibition is to be opened on May 1, great activity can be noticed, the arrangement and adaptation of the halls for this purpose having been taken in hand and exhibits already arriving in great numbers, among them a batch of some 280 pictures from Spanish artists, and some seventy-five Belgian works of art. The last receiving-day for exhibits is, as we have already stated, April 10. On May 19, the anniversary of the formation of the "Verein Berliner Künstler," under whose auspices this Exhibition is being arranged, some great fêtes are planned, in connexion with which a so-called "Künstlerfest," with procession (period: Charles the Great), will be held on May 21, and promises to be a very imposing spectacle.——The Anthropological Society intend trying to push through their idea of having a large German "National" Museum erected at Berlin, and have now taken steps to interest the Imperial Government in the matter. This is now the fourth large museum design on paper, of which number only one, the proposed classical museum (architect, Professor F. Wolff), one of the three to be placed on the so-called "museum island," has for the present any hope of seeing its completion within a reasonable space of time.——Dr. Schliemann's book, "Report on the Troy Excavations of 1890," is to be brought out next month, by the Leipsic publisher, Brockhaus. The preface is by Mrs. Schliemann, and several of the important paragraphs have been written by Dr. Dörpfeld. Dr. Schliemann's biography, which is to be an extension of the one to be found in his "Ilios," is to be published shortly, Mrs. Schliemann having taken the matter in hand.——German architects have been invited to compete for the Boissonet Bursary, value 150*l.*, given under the auspices of the Royal Technical College. The successful candidate is required to spend a summer in Sweden, and to there measure up the Romanesque Cathedral at Lund.

Ulm.—It has now been officially stated that it will still take three years to complete the work on the Ulm Cathedral, the spire of which was finished last summer.

MISCELLANEOUS.

A Cliff Tramway-lift at Hastings.—The new lift at the West Hill, Hastings, was opened on the 25th ult. The lift has been designed to afford a ready and easy means of access to the top of the West Hill, with its beautiful views and fresh breezes, which have hitherto only been attainable by the young and vigorous by considerable exertion. It also affords a means of communication between the town of Hastings and the outlying districts of Ore and Halton, which are rapidly growing into importance. To enable the lift to reach the top of the hill it was necessary to drive a tunnel a length of about 363 ft., the total length of the track being 450 ft., at an inclination of about 1 in 3. As in this case the travel is longer and the gradient less than in the Folkestone lift, the motive power is derived from a 16-h.p. Otto gas-engine, fixed in an engine-room at the top of the track, and driving through a counter-shaft on to a very powerful set of double-worm and wheel-gearing, giving motion to a large cast-iron wheel round which the steel-wire ropes pass to the cars. The gearing drives in either direction, and it is claimed that the lift is always absolutely under control, and can be stopped at any point by the attendant. When either car arrives at the top the lift is stopped automatically, so that in the event of inattention, or accident to the attendant, the cars would come to a standstill of themselves at the end of the journey; and it is added that if a driving-band should break, the cars would at once become stationary. There is also an automatic governor to arrest the lift in case of an excessive speed being attained. There are two cars, each arranged to carry sixteen persons, made of teak and ash, and suitably upholstered. Each car is fitted with a safety apparatus, consisting of a double set of powerful clutches with teeth, connected with two strong springs; these pass on each side of an oak timber fixed between the rails, and in the event of the ropes breaking the cams would close on the timbers and hold the car in position. The cars are connected by two powerful steel wire cables, each equal to a breaking strain of about twenty tons, so that every portion of the work has been constructed so as to afford an ample margin of strength and safety. The work has been carried out by Messrs. R. Waygood & Co., of Falmouth-road, London, S.E., for the Hastings Lift Company, under the supervision of their architects, Messrs. F. & J. Plowman, who adopted the scheme, and the construction of the tunnel and track was executed from their plans by Messrs. Holme & King.

The Consistory Court of London.—On November 15th last we adverted to a faculty which had been granted to the City of London Real Property Company for opening some ancient lights that overlook the churchyard of St. Gabriel, Fenchurch. On Wednesday, 25th ult., an additional faculty was granted by the Consistory Court of London, sitting in St. Paul's, in respect of a fresh right of way across the burial ground. The Company in question are owners in fee of Nos. 35 and 36, Lime-street. In April last the rector and churchwardens agreed to give to the Company a right of way from Fen-court to their premises, for a term of eighty years, at a yearly rental of £45, payable to the rector; the Company to lay out, pave, and fence in with iron railings and gates, the pathway. The Lord Chancellor, the Corporation, and the Vestry consenting, Dr. Tristram, Chancellor of the Diocese, gave the faculty as asked for, it being agreed that the public should have use of the pathway during certain hours and on certain conditions. The Court then proceeded to grant a faculty for authorising alterations in St. Paul's church, Camden-square, comprising the erection of a chancel screen with gates. This church was built about forty years ago, after the designs of Messrs. Ordish and Johnson, architects.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Public Hall and Offices, Earlestown	Newton-in-Mackerfield Commissioners	50*l.* 25*l.* and 15*l.*	May 14
*Treatment of Sewerage	Aylesbury Local Board	Not stated	No date
*School House	St. Marks, New Swindon Committee	do.	do.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Road Works	Hendon Local Board	S. S. Grimley	April 6
Timber, Kerbing, Pitching, Road Metal, &c.	Swansea Town Coun.	*Official*	April 7
*Kerbing, Paving, &c. &c.	Lewisham Bd. of Wks	do.	do.
Parish Church, Ballymacarret, Ireland	Rev. G. G. Mervyn	Samuel P. Close	do.
Maintenance of Roads	Blackrock (Ireland) Town Commrs.	*Official*	do.
Sewering and Paving	Belfast Corporation	do.	do.
*Sanitary Works	Metro. Asylums Board	W. D Young	April 8
Police Station and Residence, Plymouth	Plymouth Corp.	Geo. D Bellamy	do.
Alterations to Property, Elgin, N.B.		Chas. C. Doig	do.
Road Materials	Cerne (Dorset) Highway Board	*Official*	do.
Public Baths, &c. Templemore-avenue	Belfast Corporation	do.	do.
Farmhouse, Charlton Musgrove, near Wincanton	Mrs. Malpas	Hudson & Martin	April 9
House, Shop, &c. Crawcrook, nr. Ryton	Wm. Allen	John Harkness	do
Stoneware Pipe Sewers (2,450 ft.)	Devonport Twn Coun.	J. F. Burns	do.
Two Shops and Dwelling-house, Bramley, Leeds	Leeds Indus. Co-op. Soc. Lim.		do.
Silo House, Drying Kilns, &c. Bishopwearmouth	E. & F. Richardson	Joseph Potts	do.
*Tar Asphalting	Twickenham Loc. Bd.	H. M. Ramsay	do.
Cast Iron Pipes	Manchester Corpraton	*Official*	do.
Chapel at Cemetery	Conisbrough Burial Bd	George White	do.
Bacon Factory, Redruth	West of England Bacon Curing Co	Oliver Caldwell	April 10
Supply of Materials	Bootle Corporation	*Official*	do.
House, Pill, Somerset	W. H. Gilmore	E. H. Edwards	do.
Iron Fencing, Baddiley Mere	Nantwich Local Bd.	W. S. Williamson	do.
New Cemetery Chapel at Durham County Lunatic Asylum	Visiting Committee	Wm. Crozier	April 11
*Road Materials	County of Chester	S Bull	do.
Premises, Blandford, Dorset		W. J. Fletcher	do.
9 Cottages, Cymmer, Glyncorrwg, near Pontypridd	George Evans	A. O. Evans	do.
*Asphalte Road Works	St. Giles Board of Wks	C. Wallace	April 13
*Painting, Cleaning, and Repairing Works	Metro. Asylums Board	*Official*	do.
*Tar Paving	Bournemouth T. C.	F. W. Lacey	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Two-storey Goods Shed (1,376 ft. in length)	Clyde Navigation Trus	Jas. Deas	April 13
Road Materials	Hoo (Rochester) Highway Board	T. W. Price	do.
Police Station, Failsworth	Lancashire C.C.	W. T. Gannon	do.
Police Station, Levenshulme	do.	do.	do.
New North Pier	Arklow Harbor Comrs	W. G. Strype	do.
*Sewerage Works, Mitcham-lane	London County Council	*Official*	April 14
New Road, George Inn	Gelligaer Highway Bd.	W. Bevan	do.
*Making-up Carriageways and Paving Footways	Willesden Local Board	O. Claude Robson	do.
*Pipe Sewers, &c.	do	do.	do.
Schools, Cadbury Heath, near Warmley	Oldland School Board	Bernard & Drake	do.
Heating Schools, Kingswood, near Bristol	do.	W. L. Bernard	do.
Re-building Church, Waterloo, Liverpool	do.	Paley, Austin & Paley	do.
*Pipe Sewers, &c.	Fulham Vestry	J. P. Norrington	April 15
*Roadmaking and Paving Works	do.	W. Sykes	do.
Police Station, Masham, Yorks	N. R. County Council	Walker Stead	do.
*Drainage Works at Lambeth Infirmary	Lambeth Guardians	T. W. Aldwinckle	do.
Repairs to several Police Stations	Dorset Standing Joint Committee	*Official*	do.
*Public Works	Southampton Corp.	W. B G. Bennett	April 2
*Four Miles of Cast-iron Socket Pipes	Coventry Waterworks	T. & C. Hawksley	do.
New Cemetery	Witton & Deane Bridge (Cheshire Burial Brd	Jas. Holland	April 23
*New Post Office at Blackpool	Com. of H M. Wks, &c	*Official*	April 24
*New Offices	New Barnet Valley Local Board	F. W. Shenton	April 27
*General Works, Extending Goods' Warehouse and Offices	N. E. Ry. Co.	W. Bell	April 29
*Shop Buildings, Brentwood	W. A. Wilson & Co	E. N. Cubitt	No date
*New Grammar School, Chelmsford	King Edward VI. Grammar School	H. A. Cheers	do.
Forty Bee-hive Coke Ovens, near Annfield Plain, co. Durham	South Moor Coll. Co.		do.
Draining, &c. Twenty Houses, Leeds	A. F. Holroyd		do.
Two Dwelling-houses, Francis-street, Leeds		Geo. Hutton	do.
199 Cottages, Desaby, Yorks	H. Arnold & Sons		do
Steel Girders, Beams, &c.	Coatbridge (N.B.) T.C.	A. M'G. Mitchell	do.
Wesleyan Chapel and School, Bentley, near Doncaster		C. J. Innocent	do
Church, Heap Bridge, near Heywood, Manchester		John Lowe	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Assistant Secretary	Architectural Assoc.	100*l.*	April 7
*Sanitary Inspector	Westminster Vestry	120*l.*	April 16
*Architectural Draughtsman	Wakefield Coun. Surv.	2*l.* 10*s.*	No date

Those marked with an Asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv. vi. *and* ix. *Public Appointments, p.* xx.

PROPERTIES FOR SALE. — By private contract: Cers-y-Gedol, on the west coast of Merionethshire, between Harlech and Barmouth, consisting of more than 5,000 acres, and an old Elizabethan residence. Three large lakes and the River Ysgethin provide good fishing, and a seaward track of about 1,000 acres could be converted into a golf-link and to building purposes. By auction, at Edinburgh, on the 22nd instant, the Penicuick estate, in Midlothian and Peeblesshire. This property, of nearly 10,600 acres, and yielding an aggregate rental of 8,196*l.*, besides that of the house and shootings, will be offered at an upset price (reduced) of 210,000*l.* Penicuick House, on the North Esk, was built in 1761, for Sir James Clerk, Bart., who employed Runciman to decorate the ceiling of the "Ossian's Hall." Hard by stand the ruins of Brunstane Castle, and Logan House, an ancient hunting-seat. Sir James Clerk set up in his grounds an obelisk to Allan Ramsay; Newhall, Linton, and Habbie's How, on Glencross burn, in the neighbourhood, have been identified with some of the scenery described in the "Gentle Shepherd." And by public sale, at Edinburgh, on the 15th instant, the Dunalastair estates, in Perthshire, including Lochgarry, Kinloch Rannoch, Dunalastair, Crossmount, &c., and extending over 20,000 acres in all. These sporting properties will be "exposed" at an upset price of 140,000*l.* Loch Rannoch, on their western border, is famous for its situation and as the scene of some memorable episodes of early feudal history in Scotland.

LIVERPOOL ENGINEERING SOCIETY.—The ninth ordinary meeting of this Society was held at the Royal Institution, Colquitt-street, on Wednesday evening, March 18. A large number of members had assembled when the President, Mr. Ferdinand Hudleston, Assoc. M. Inst. C.E., took the chair. The principal business of the evening was the adjourned discussion upon Professor H. S. Hele Shaw's paper, entitled "The Education of an Engineer," which was read at the last meeting of the Society. The President opened the discussion, and, in his remarks, emphasised many of the points bought forward in the paper. He thought the preliminary education of an engineer should be as broad as possible, and urged in particular the value of the study of the higher mathematics. He also impressed upon the meeting the value of scientific societies, and the benefits to be obtained from them. — Mr. George Farren referred to the Continental system of training, and gave particulars of various courses of studies adopted in the Government schools in Holland for the preparation of engineers.—Mr. Henry H. West dealt principally with what he called the half-time system of training, six months' College, and six months' work, and entered an energetic protest against such a system. He advocated the old-fashioned principle of five or seven years' apprenticeship in the shop or office, and suggested that that should be followed, if possible, by two years of college training.—Mr. Andrew Higginson spoke from experience with his own apprentices in favour of this system, by which the engineering student had six months' work in the shops in the summer, and six months' training in the college in the winter.—Mr. J. H. T. Turner thought that the student should first be brought face to face with the commercial aspect of his profession, and later on, when he has seen what is actually done, and what has to be done in the shops and offices, in the field or on works, then let him give some time to scientific study of the principles that underlie what he has seen practised.—Mr. Robert E. Johnston looked upon technical engineering colleges as extremely valuable, and spoke as to the value of technical education to the artisan class.—Mr. Coard S. Pain spoke in favour of the present English system as against the Continental system.—Upon the termination of the discussion, Professor Hele Shaw replied to various queries that had been put and objections that had been made with regard to points raised in the paper, and a unanimous vote of thanks terminated the proceedings.

THE ENGLISH IRON TRADE.—The holidays and the nearness of the quarterly meetings have both contributed towards making the past week one of the quietest of the year. The market is still weak and prices are nominal, and in cases where actual business is put through they are generally in favour of buyers. Only a very moderate business has been done in pig-iron, and at lower prices. Warrants have pursued their downward course, and Middlesbrough pig-iron is 6d. a ton cheaper. As a rule, makers have ceased quoting altogether, as no satisfactory terms can be secured by them, thinking it the wiser plan to await the result of the quarterly meeting. A similar feeling exists in the manufactured iron trade, and bars and sheets are 2s. 6d. lower in price. There is an easy tone in tinplates, which are quiet. The steel trade is hardly better than the finished iron branch, but there are more inquiries for rails. Shipbuilders are not booking nearly the tonnage they are launching, and are looking forward to quieter times. Engineers, although fairly well engaged at present, are beginning to feel the effect of a reduced inquiry.—*Iron.*

THE GOVERNMENT BUILDING CONTRACT.—There appears to be an uncertainty in the building trade as to the terms upon which the new triennial building contract of the Government has been offered and accepted. "Is sub-contracting prohibited?" is asked by one, "Is overtime to be fully paid for?" by another. Without going into the matter in detail it may be said in answer to the first question that while sub-contracting is not wholly forbidden, clauses have been inserted in the agreement between the Office of Works and the contractor by which the sweating, at all events, will be rendered impossible even should the contractor wish it. "Sub-contracting" is becoming a somewhat ambiguous term, and the best method of judging of its merits and demerits is by estimating the good and the evil it represents in each particular case. If it mean the relegation to special industries of the small portions of a contract which do not come within the range of the operations of the contractor-in-chief, then, under proper restrictions, there is little to be said against it; if it represent in the slightest degree a propagation of the sweating evil it ought to be abolished entirely. As to payment for extra work, we are informed that the attention of the Office of Works has been directed to the discouragement of overtime, and to insisting that where overtime is necessary it shall be paid for at the rate prevailing in the trade.—*Evening News and Post.*

MEETINGS.

SATURDAY, APRIL 4.

Association of Public Sanitary Inspectors.—Dr. G. Danford Thomas on "Burial and Funeral Reform." 6 p.m.

MONDAY, APRIL 6.

Royal Institute of British Architects.—Mr. William Simpson on "Mutation in Indian and Eastern Architecture." 8 p.m.

Surveyors' Institution.—Mr. C. Fortescue Brickdale on "The Present Work of the Land Registry." 8 p.m.

Builders' Clerks' Benevolent Institution. — Annual Dinner, Cannon-street Hotel. 6 p.m.

Society of Engineers.—Mr. T. B. Lightfoot on "A Trial of a Refrigerating Machine on the Linde System." 7.30 p.m.

Clerks of Works Association (Carpenters' Hall).—Ninth Annual Meeting. 8 p.m.

Royal Institution.—General Monthly Meeting. 5 p.m.

Liverpool Architectural Society.—Paper by Mr. W. E. Hill. 7 p.m.

TUESDAY, APRIL 7.

Institution of Civil Engineers.—Mr. R. E. B. Crompton on "The Cost of the Generation and Distribution of Electrical Energy." 8 p.m.

Society of Biblical Archæology.—(1) Mr. J. Pollard on "The Baal and Ashtoreth Altar Discovered at Kanawat in Syria, now in the Fitzwilliam Museum, Cambridge." (2) Paper by the Rev. C. J. Ball. 8 p.m.

Glasgow Architectural Association.—Mr. Robert Wemyss on "The Life and Work of Michelangelo." 8 p.m.

WEDNESDAY, APRIL 8.

Society of Arts.—Mr. A. P. Laurie on "The Durability of Pictures Painted with Oils and Varnishes." 8 p.m.

THURSDAY, APRIL 9.

Society for the Encouragement of the Fine Arts.—Mr. T. L. Southgate on "A Phase of Ancient Egyptian Art." 8 p.m.

Institution of Electrical Engineers.—Mr. W. B. Esson on "The Design of Multipolar Dynamos." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Edinburgh Architectural Association.—Mr. A. H. Millar on "Curiosities of Architecture in Dundee." 8 p.m.

Dundee Institute of Architecture.—Mr. A. Hutchesons F.S.A Scot., on "The Sculptured Stones of Scotland." 8 p.m.

FRIDAY, APRIL 10.

Architectural Association.—Mr. Percy D. Smith will read "The Travelling Student's Notes." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—(1) Mr. W. F. Fullon on "Modern Locomotive Construction." (2) Mr. John H. Barker on "The Design of Locomotive Cylinders." 7.30 p.m.

Royal Institution.—Sir William Thomson on "Electric and Magnetic Screening." 9 p.m.

SATURDAY, APRIL 11.

Architectural Association.—Visit to the Church of St. John the Baptist, Holland-road, Kensington. 3 p.m.

Royal Institution.—Professor Silvanus P. Thompson on "The Dynamo." I. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

7,318.—SEWERAGE SYSTEM: *W. Hallock.*—This invention relates to a system of drainage, consisting of a succession of man-holes with bottoms on the same level, and connecting-pipes placed on the same level grade, the whole system is trapped by a single trap, which is formed by placing the discharge-pipe on the last man-hole above the level of the connecting-pipes.

9,180.—VENTILATING FANS: *R. W. Waddle.*—The fan which is the subject of this patent is provided with a band or partial covering which contracts the available outlet, and utilises a larger percentage of the power required to work the ventilating fan.

13,134.—BRICKS, SLABS, &c.: *C. D. Abel.*—To make porous and fire-proof bricks and similar articles used in building purposes, the inventor uses a volcanic material (pumice-sand or pumice-gravel), which is mixed with slaked lime or gypsum or cement. The bricks are very light, porous, and fireproof, and, possessing a rough surface, bind together most effectually when laid in mortar or cement, affording a very efficient keeping surface for plastering.

16,619.—VENTILATING FANS: *H. W. Waddle.*—In the open running fans the blades are, by this invention, arranged so that the air is less suddenly forced into motion, and thus less power is required to drive the fan.

19,329.—IMITATING WALNUT WOOD: *P. Jaeger.*—To imitate walnut wood the inventor employs the following method:—Planks of inferior wood are piled in a closed air-tight chamber, with walnut husks between them, some of the husks being treated with a mixture of ebony and iron-filings, so that by the action of steam the wood may acquire a colour shading and graining like walnut wood.

IMPROVED WINDOW SASH-STOP: *J. Pollock.*—This invention consists of a window stop in two pieces, one a screw or plug fitting into the side of upper sash, about 1in. above the lower one with a hole in it; the other being a split pin fitting tight into the hole of boss and projecting over the under sash, to prevent either sash being beyond it.

3,507.—SQUARE TURNING BALUSTERS, &c.: *E. Antlan.*—The chief object of this invention is to provide means whereby the strips or pieces can be easily removed, and the whole surface of the drum can be covered, notwithstanding the width of the strips. To effect this holding flanges and fittings are adapted to allow the strips to be placed closely on the drum.

NEW APPLICATIONS FOR PATENTS.

March 16.—4,626, J. Burghes, Joint for Drain-pipes.—4,635, J. Chaffer, Securing Sashes, &c., when Opened or Closed.—4,657, L. Forester & H. Greatbatch, Composition for Economy in Placing Glazed Tiles or Plaques, &c., Majolica and Earthenware in Kilns or Ovens, also Washing Kilns.—4,665, D. Tuley, Hinges.—4,671, W. Hart & J. Graham, Fastening of Skylights, &c.—4,672, Wilson, Stucco for Plastering.—4,686, R. Warren, Fastening Attachment for Gates.—4,691, S. Phipps & J. Stephens, Fastenings for Window Sashes.

March 17.—4,725, S. Thompson & J. McEwen, Syphon Trap for Water-closets and other Cisterns.—4,743, N. Webbs, Indicator for Doors.—4,750, The Société Anonyme des Ardoisieres de Deville & Victor Van Der Weyden, Material for Building, Pairing, &c., from Waste Pieces or Débris of Slate.—4,769, H. Button, Holding Safety Steps or Ladders.—4,765, F. Simonson, Machinery or Apparatus for Handling Logs in Saw Mills.—4,779, T. James, Glazed Panels for Furniture and Interior Decorative Work.

March 18.—4,819, J. Southall, Flushing Cisterns.—4,836, E. and J. Hutchings, Press-down Lever for Opening and Opening Closet.

March 19.—4,940, H. Woodhouse, Fire Grates or Stoves.—4,948, H. Smith, Plane for Beading and Side Planister.

March 20.—4,962, A. Goerke, Buildings or Structures.—4,973, J. Wilson, Checking or Registering and Indicating Workmen's Time.—4,981, H. Clark, Stench Preventer, Drain Ventilator, and Improved Trap, for all purposes, all shapes, and all sizes of drains.—4,983, F. Smith and J. Corbett, Iron Casements and Frames.—5,000, J. Boyd-Wilson, Compositions for Use in Building Constructions, &c.—4,997, J. Bennett, Roof Tiling.—5,028, W. Horn, Ventilating and Heating the Walls of Buildings.—5,032, W. Thompson, Construction of Towers, Chimneys, &c.—5,041, H. Leigh, Waterclosets.

March 21.—5,068, F. Quéry, Kilns for Use in the Manufacture of Pottery, &c.—5,089, A. Smith, Ornamentation of Wood, &c.—5,081, W. Munns, Dooranger.—5,123, W. Longmire, Rain-water Stacks or Water Pipes, &c.—5,127, J. D'Almeida and another, Gas-indicating Apparatus.

PROVISIONAL SPECIFICATIONS ACCEPTED.

894, H. Dixon and H. Cohen, Veneering Cabinet-furniture, &c.—1,403, C. Pfister and J. Schmidt, Flushing Cisterns.—2,831, F. Podger, detaching Sashes from Window-frames and raising and lowering same without Weights.—3,276, R. Whitaker, Wood and other Screws.—3,353, A. Francombe, Slow Combustion Fire Stoves.—3,369, J. Hamilton, Fire-grates.—3,550, W. Barns and J. Kilburn, Wheelbarrows.—3,610, A. Steale and W. Cuningham, Stoves or Fire-grates.—3,637, T. Brown, Ventilators for house drains, &c.—3,734, P. Bright, Lavatory Basins.—3,747, H. Snell, Water-closets, &c.—3,842, A. Morison, Lock or Latches for Water-closets, &c.—4,247, J. Adair, Baker's Ovens.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

3,822, D. Cliff, Effecting Correct Designs on Decorative Tiles.—18,667, H. Heiland and J. Kaufmann, Scaffolding.—2,865, H. Williams, Composition for Paving &c.—2,947, J. Meyer, Coupling of Outlet or Discharge Pipes to Sewer or Drain Pipes.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MARCH 19.—By *Dyer, Son, & Hilton* (at Lee): 193, Shardeloes-rd., Lee, u.t. 37 yrs., g.r. 18*l.*, r. 55*l.* p.a., 470*l.*; 54, and 56, Church-st., and plot of land, u.t. 37 yrs., g.r. 45*l.* 10s., r. 360*l.*; 20, Dacre Pk., u.t. 35 yrs., g.r. 10s., r. 30*l.*, 165*l.*

MARCH 23.—By *Moss & Jameson:* 179, Albion-rd., New Newington, f., 2,010*l.* By *Chesterton & Sons:* 93, Leicester-ter., Hyde-pk., u.t. 62 yrs., g.r. 18*l.*, £2,110*l.* By *Edward Wood:* 152, Meyrick-rd., Battersea, f., r. 148*l.*, 275*l.*; 8, 9, and 10, Ingoldisthorpe-grove, Old Kent-rd., f., r. 71*l.*, 840*l.*; 126, Eastfield-st., f., r. 18*l.* 4s. p.a., 135*l.*; 8, Roskill-rd., Putney, u.t. 94 yrs., g.r. 5*l.* 10., r. 42*l.* 18s., 250*l.*; 52, Alkham-rd., Stoke Newington, u.t. 86 yrs., g.r. 28*l.*, 470*l.*; The Residences "Albert House," "Gladstone House," and "Granville House," Tetcott-rd., Chelsea, u.t. 91 yrs., g.r. 30*l.* 12s., r. 317*l.*, 1,425*l.* By *W. & F. Houghton:* 184, Camberwell-grove, Denmark-hill, f., 610*l.*; the residence "Roxburgh," Prospect-hill, Walthamstow, f., 650*l.* By *Alfred Richards:* 84 and 86, Marylebone-lane, Manchester-sq., u.t. 9 yrs., g.r. 42*l.*, 400*l.* By *J. H. Bulmer:* 28, Cooper's-rd., Old Kent-rd., u.t. 41 yrs., g.r. 4*l.* 10s., r. 33*l.* 16s., 220*l.* By *E. H. Sales:* 17, Cambridge-rd., Lee, u.t. 73 yrs., g.r. 10*l.*, 300*l.*

MARCH 24.—By *R. W. Scobell:* 1,g.r. of 12*l.*, Mecklenburgh-sq., u.t. 18 yrs., g.r. 62*l.*, 635*l.*; 44, King's-cross-rd., Clerkenwell, f., r. 50*l.*, 750*l.*—By *Vaughan & Co.:* 20, Acacia-rd., St. John's Wood, u.t. 43, yrs., g.r. 50*l.*, r. 55*l.*, 560*l.*—By *Debenham, Tewson, & Co.:* 203 and 205, Queen's-rd., Dalston, u.t. 38 yrs., g.r. 21, r. 107*l.* 10s., 1,000*l.*; 94, Beulah-hill, Norwood, u.t. 78 yrs., g.r. 20*l.*, 730*l.*—By *Farebrother, Ellis, & Co.:* 112, Queen's-rd., f., 920*l.*; an enclosure of f. land, East Ham, 8a. 2r. 16p., 1,200*l.*; an enclosure of f. land, 50a. 3r. 8p., 4,600*l.*—By *E. Tabernacle:* 1, 2, 7, and 8, Prospect-pl., Woodford, f., r. 64*l.*, 430*l.*; 3 to 10, Vicarage-ter., Leyton, f., 2,325*l.*; 1 to 8, Avenue-rd, f., 1,190*l.*

MARCH 25.—By *A. Young:* Two plots of f. land, Armada-st., Deptford, area 25,823 ft., 1,460*l.*; A plot of f. land, Trevithick-st., area 5,280 ft., 400*l.*; a plot of f. land, Benbow-st., area 6,980 ft., 850*l.*; 23, Mount Pleasant, Clerkenwell, f., area 2,237 ft., 1,520*l.*; a plot of f. land, Kentish-town-rd., area 9,760 ft., 3,600*l.*; a plot of f. land, Brook-st., Ltmehouse, area 1,116 ft., 120*l.*; two plots of land, Rosebery-av., Clerkenwell, area 1,501 ft., let for 80 yrs. at 37*l.* a year; two plots of land, area 1,664 ft., let for 80 yrs. at 34*l.* a year; six plots of land, area 8,641 ft., let for 80 yrs. at 208*l.* a year; a plot of land, Coldharbour-lane, Camberwell, area 1,970 ft., let for 80 yrs. at 22*l.* a year. By *Jenkins & Sons:* 70, Wickham-rd., Brockley, u.t. 81 yrs., g.r. 24*l.*, 1,300*l.*—By *W. Andrews & Son:* 1 to 4, Sussex-pl., Mortlake, 1 and 2, Sussex-cottages, and "Elizabeth Cottage," u.t. 58 yrs., g.r. 14*l.*, r. 109*l.* 16s., 710*l.*—By *R. J. Collier:* 132 and 134, King Edward's-rd., Hackney, u.t. 48 yrs., g.r. 13*l.*, 1,103*l.*; a plot of freehold land, Muswell Hill, 1a. 1r. 18p., 200*l.*—By *R. Tidey & Son:* 15, Southgate-rd., Kingaland, u.t. 27 yrs, g.r. 8*l.* 15s., 215*l.*

MARCH 26.—By *C. E. Joy:* 1 Cottage-pl., Kensington, u.t. 29 yrs., g.r. 8*l.*, r. 40*l.*, 350*l.*—By *T. Young:* 9, Hampton-rd., Forest Gate, u.t. 85 yrs., g.r. 8*l.* 16s., r. 35*l.*, 285*l.*—By *Dyer, Son, & Hilton:* "Alison Lodge," Court-rd., Eltham, 7 yrs., g.r. 50*l.*, 2,500*l.*—By *A. Cole & Co.:* 84 and 88, Wharton-rd., Kensington, u.t. 59 yrs., g.r. 11*l.*, 800*l.*; 26, Hayter-rd., Brixton, u.t. 76 yrs., g.r. 8*l.*, 445*l.*; 2 and 4, Poultney-st., Islington, u.t. 14 yrs., g.r., 10*l.*, r. 56*l.*, 165*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; j.g.r. for improved ground-rent; c.g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	load	6/0/0 7/15/0
Teak, E.I.	load	8 10 0 14/0/0
Sequoia, U.S.	ft. cu.	2 3 3/0
Ash, Canada	load	2 10 0 4 5 0
Birch	do.	2 7 0 4 5 0
Elm	do.	3 10 0 4 15 0
Fir, Dantzic, &c.	do.	2 0 0 3 15 0
Oak, do.	do.	2 10 0 4 10 0
Curvals	do.	4 17 6 6 10 0
Pine, Canada red	do.	2/10/0 3/10/0
Do. yellow	do.	2/0/0 3/10/0
Lath, D'antzic, fath		5/0/0 6/0/0
St. Petersburg		5/0/0 7/0/0
Deals, Finland,		
2nd & 1st std	100	7 0 0 10/0/0
Do. 4th & 3rd	do.	7/0/0 8/0/0
Do. 2nd yellow	do.	8/0/0 9/0/0
Do. white	do.	6/10/0 10/0/0
Swedish	do.	6 10 0 15 0 0
White Sea	do.	8 0 0 16 10 0
Canada, Finelat		13 0 1 24 0 0
Do. do. 2nd	do.	9 0 0 15 10 0
Do. do. 3rd, &c.	do.	6 10 0 16 0 0
Do. Spruce, 1st	do.	8/10/0 10/10/0
Do. do. 3rd & 2nd	do.	8/0/0 7/10/0
New Brunswick	do.	5/0/0 7/0/0
Battens, all kinds	do.	3/10/0 15/10/0
Flooring Boards, sq. 1in. prep		0 10/0 0/14 0
1st	do.	0 10/0 0/10 6
Do. 2nd	do.	0 0/0 0/8 6
Other qualities	do.	0 5 0 0 7 6
Cedar, Cuba	ft.	4 /4
Honduras, &c.	do.	/4 /4½
Mahogany, Cuba	do.	/4½ /6½
St. Domingo, cargo av	do.	/4½ /6½
Mexican	do.	/5½ /5½
Tobasco &c.	do.	/5 /7
Honduras	do.	/5½ /6½
Box, Turkey	ton	4/0/0 13/0/0
Rose, Rio	do.	10/0/0 20/0/0
Bahia	do.	9/0/0 18/0/0

TIMBER (*continued*).		
Satin, St. Domingo	ft.	0/0/10 0/1/3
Porto Rico	do.	0/0/9 0/1/6
Walnut, Italian	do.	0/0/3½ 0/0/7
METALS.		
IRON—Bar, Welsh, in London	ton	6/5/0 6/15/0
Do. do. at works in Wales	do.	5 15 0 6 5 0
Do. staffordshire, in London	do.	6/5/0 7/0/0
COPPER—British, cake and ingot		56/0/0 57/0/0
Best selected	do.	59/0/0 60/0/0
Sheets, strong	do.	66/0/0 0/0/0
Chili, bars	do.	52/10/0 0/0/0
YELLOW METAL	lb.	0/0/8½ 0/0/8½
LEAD — Pig, Spanish	ton	12/12/6 0/0/0
English, com. brands	do.	12/15/0 13/0/0
Sheet, English, 3lbs per sq. ft. and upwards	do.	14 5 0 0 0 0
Pipe	do.	14 10 0 0 0 0
ZINC — English sheet	ton	26/10/0 0/0/0
Vieille Montagne	do.	27/0/0 0/0/0
TIN—Straits	do.	90 10 0 0/0/0
Australian	do.	90/15/0 0/0/0
English Ingots	do.	94/10/0 0/0/0
OILS		
Linseed	ton	22/10/0 22/15/0
Cocoanut, Cochin	do.	36/0/0 0/0/0
Do. Ceylon	do.	30/0/0 0/0/0
Palm, Lagos	do.	27/0/0 0/0/0
Rapeseed, English pale	do.	29/15/0 30/0/0
Do. brown	do.	28/5/0 28 10 0
Cottonseed refined	do.	21/10/0 0/0/0
Olein	do.	21 15 0 24 0 0
Lubricating, U.S.	do.	6/0/0 7/0/0
Do. refined	do.	7/10/0 12/0/0
TAR—Stockholm	barrel	1/1/6 1/2/0
Archangel	do.	0/13/6 0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than 12 noon on Thursdays.*]

ABERDARE.—For alterations to Nos. 3 and 4, Cardiff-street, for the Aberdare Co-operative Society, Limited. Mr. Charles H. Elford, architect, 16, Cardiff-street, Aberdare:—

John Morgan	£537 0 0
Jones & Charles, 22, Wind-street, Aberdare*	439 0 0

* Accepted.

ABERTILLERY (Mon.).—For the erection of an infant school at Six Bells Village, for the Llanhilleth School Board. Mr. Jas. McBean, architect, Abertillery, R.S.O. (Mon.):—

A. P. Williams	£1,260
William Jones & Son, Newport, Mon. (accepted)	997

ACTON.—For the erection of a house and laundry, Park-road, North Acton, for Mr. H. Hawkes. Mr. Thos. S. Stephens, architect, Acton:—

W. Neil	£1,188
F. Colwill & Co.	1,100
A. Morgan	1,070
H. G. Heywood (accepted)	£1,048
J. Jackson	1,038
R. Barclay	748

[Architect's estimate, £1,060].

ALTRINCHAM.—For the construction of a 12-in. pipe sewer along Back-lane, Timperley, for the Union Rural Sanitary Authority. Mr. McKenzie, Surveyor, Lossie Bank, Hale, near Altrincham:—

Geo. Bowen	£205	W. Burton, Altrincham*	£185
Jas. Hamilton	157	G. Bemerson	120

* Accepted.

BANGOR (Co. Down).—For forming and completing outfall sewer and three new roads, for Mr. R. F. Ward, D.L., Bangor Castle; Mr. Daniel Drew, J.P., Belfast, and Mr. John Moore, Belfast. Mr. John Russell, engineer, 16, Waring street, Belfast:—

Wm. Geddis	£4,485 0 0	Workman & Green	£2,606 14 1
W. H. Campbell	3,267 10 0	J. Ross & Son	2,543 16 2
Charles Ritchie	3,533 0 0	Thos. Mac Murray, Lisburn	2,427 0 0
J. Quinn	3,227 7 4	Warrenpoint	2,404 16 3
John Stewart & Son	3,175 10 0		

* Accepted.

For outfall sewer and Mr. Moore's one road only.

J. Colville, Bangor	£741 7 9

BECKENHAM.—For alterations and additions to the "Ferns," Beckenham. Mr. Newton Dunn, architect:—

Andrew & Nanson	£902 0 0	Syme & Duncan	£512 0 0
Maxwell Bros.	547 0 0	Coffin	451 11 0
Peacock Bros.	515 0 0	Carmichael	480 0 0

BOVEY TRACEY (Devon).—For the erection of a shop and dwelling-house, for Mr. Peters. Mr. Samuel Segar, architect, Union-street, Newton Abbot:—

Gibson	£1,230 0 0	Blackmore	£947 0 0
Wills Bros.	1,043 7 0	Brimblecombe	943 0 0
Zealley	1,000 0 0	Vanstone	932 0 0
Winser	1,021 5 0	Yeo	875 0 0
Palfrey & Davie	1,000 0 0	Bearne	873 0 0
Stacey	1,022 0 0	Barrow, Newton Abbot (accepted)	794 0 0

BRISTOL.—For the erection of mansion buildings in St. Philip's District. Mr. John Bevan, architect, 4, Unity-street, Bristol:—

T. H. Brown	£2,298	W. Church	£2,044
Easterbrook & Sons	2,250	O. E. Davis	2,014
Stephens & Bastow	2,129	T. L. Hathaway	1,997
A. G. Pope	2,100	J. Perkins	1,990
E. W. Teris	2,240	R. Wilkins & Sons	1,945
Cowlin & Son	2,087	J. Perrett	1,939

All of Bristol.

BRISTOL.—For the construction of a bakehouse and store at Bishopston, Bristol, for Mr. S. S. Curtis. Mr. A. P. I. Cotterell, architect, 7, Baldwin-street, Bristol:—

J. Bastow	£900 0 0	C. Charley & Son*	£951 0 0
Wilkins & Sons	884 0 0		

* Accepted.

[Architect's estimate, £954.]

CHISLEHURST.—For additions and alterations at private residence, Chislehurst, Kent. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C.:—

W. Holt & Son	£142 10	F. Wood	£124 12
Stratford & Son	132 0	R. A. Lowe	120 0
T. Crosley	125 10	D. Payne, Bromley*	106 0

* Accepted.

COOKHAM.—For alterations and additions to Moor Hall, for Mr. Frank H. Lambert. Mr. Edward Hide, architect, New City Chambers, 124, Bishopsgate-street, E.C. Quantities by Mr. Edward J. Payne, 11, Great James-street, W.C.:—

Bracher & Sydenham	£5,470	Cooper & Sons	£4,420
Peter Bros.	5,021	Cox & Co.	4,275
J. Wood-ridge	4,850	Silver & Sons, Maidenhead (accepted)	4,160
Norris & Son	4,804		

COVENTRY.—For alterations and additions to the male sick wards, &c., at the workhouse at Meriden, for the Meriden Union Guardians. Mr. H. W. Chattaway, architect, Trinity churchyard, Coventry:—

Clark	£480 0 0	W. Moss	£390 0 0
S. Downs	400 0 0	C. Rope	385 0 0
W. Gilch	390 0 0	C. J. Hill, Coventry*	380 0 0

* Accepted.

CROYDON.—For the erection of a factory in Church-road, Croydon. Mr. Henry Gough, architect, Station-road, West Croydon:—

W. Manger	£2,784	A. Bull	£2,555
H. Hurst	2,740	M. Taylor	2,723
Kime & Son	2,700	E. J. Saunders	2,500
H. & J. Saunders	2,680	E. P. Bulled & Co.	2,463
W. Smith	2,640	D. W. Barker	2,353
S. Page	2,567		

FARNBOROUGH (Kent).—For the erection of shop and stables at Farnborough, Kent. Mr. G. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C.:—

W. Owen, Farnborough	£100 0 0		

[Accepted; not to contract.]

GATESHEAD.—For the erection of a residence at Low Fell, Gateshead-on-Tyne, for Mr. Benjamin D. Raine. Mr. Thos. Reay, architect, 95, Pilgrim-street, Newcastle-on-Tyne:—

Nobb & Waugh	£1,097 7 9	Robert Henderson	£914 10 0
F. Wakefield	926 0 0	Thos. Gateshead, Gates.	860 17 0
Thos. Robson	860 17 0		

GRAYS.—For erecting office in the New-road, for Mr. H. Perter. Mr. H. Seager, architect, Gravesend:—

Brown	£170 0 0	Carter	£158 12 6
C. Ross	167 0 0		

[Architect's estimate, £150.]

HEXHAM.—For the erection of new premises, Cattle Market, Hexham, for Dr. Stamthorpe, credit being given in the amounts of the tenders for the old material upon the site. Quantities by Messrs. Bolton & Morton, Sunderland. Mr. Henry Groves, architect, Albany Chambers, South Shields:—

H. Brown & Co.	£2,495 0 0	Ed. Snowball	£2,222 0 0
J. Elliott	2,445 0 0	W. & J. Darlington	2,172 0 0
Wm. Scott	2,374 18 5	J. Civil, Hexham	
Rutherford & Armstrong	(accepted)		2,113 0 0

LEITH.—For work in the erection of a shop at Craighall road, Leith, for the School Board. Mr. Geo. Craig, architect, 79, Duke-street, Leith:—

Mason Work.—A. & W. Fingzies, Leith			£1,390 0 0
Carpenters.—W. & J. R. Watson, Edinburgh			1,550 0 0
Ironwork.—Peter Bell & Son, Edinburgh			288 17 8
Slaters.—W. & S. Christie, Leith			172 0 0
Plaster, Cement, and Tile.—P. F. Cavanagh, Edinburgh			1,729 0 4
Plumbers and Gasfitters. Thos. M. Pherson, Leith			913 0 0
Painters. Hadden & Sons, Leith			285 10 9½
Heating.—Lowe & Son, Edinburgh			392 0 0

LONDON.—For the erection of factory, Golden-lane, E.C., for Messrs. I. & R. Morley. Contract No. 2. Mr. H. J. Treadwell, F.S.I., architect:—

	Add Alternative Estimate for Floods.	Credit.
Peto Bros.	£29,992	£1,761 £520
Dove Bros.	29,670	1,740 780
Bywaters	28,187	1,845 860
Brown & Son, & Bluebell	28,140	1,866 420
Rook & Son	28,148	1,992 480
Colls & Son	27,765	1,726 880
Ashby Bros.	27,439	1,864 600

LONDON.—For alterations at the premises of the Central Bank of London, White Lion-hill, Branch. Mr. Herbert Knight, architect, 129, Cheapside, E.C.:—

Hearle & Son, Whitechapel (accepted)	£1,998 10 0

LONDON.—For the erection of baths and washhouses in the Caledonian-road, N., for the Commissioners of Baths and Washhouses for the Parish of St Mary Islington, N. Mr. A. Hessell Tiltman, architect. Quantities supplied by Mr. J Leaning:—

Willmus & Sons	£18,450	Brass & Son	£16,777
Nightingale	17,283	Balnain	16,520
Stimpson	17,230	Thos Turner, Limited	16,270
Todd	16,881	J. Allen & Sons	15,695
Chessum & Sons	16,870	J. O. Richards in, Albert Works, Peckham*	14,993
Kirk & Randell	16,848		
Willmott & Sons	16,800		

*Accepted.

LONDON.—For erecting new stores, offices, and entrance in the Eastern Hospitals, Homerton. Mr Keith D. Young, architect. Quantities supplied by Mr. W. T. Farthing:—

J. O. Richardson	£7,369	Gibbon	£5,625
Stephens & Bastow	6,767	Balnain	5,588
Eyre	6,698	Allen & Sons	5,540
Wall	6,580	Chessum & Sons	5,500
Mallett	5,977	Wells (accepted)	5,481
Lawrance & Sons	5,956	Hughes	5,391

LONDON.—For the completion of the upper stage of the tower and spire of St. Mary's Church, Newington, Surrey. Mr. James Fowler, architect, Louth, Lincolnshire:—

	Tower.	Spire.	Total.
Higgs & Hill	£2,100	£1,250	£3,350
D. Charteris	1,817	1,284	3,101
R. B. Nightingale	1,826	1,198	3,024
Cornell & Baxter	1,875	1,150	3,025
Dove Brothers	1,780	1,200	2,980
Chas Bryant	1,800	1,175	2,975
Rudd & Son	1,775	1,025	2,800

LONDON.—For repairs, decorations, &c., at the "Horse Shoe" Hotel, Tottenham-court-road. Mr J M Knight, architect:—

Majlo	£3,218 19 2	Shoolbred	£3,011 15 0
Patman & Fleming (Glading	2,894 0 0	Foxley	1,940 0 0
Rabbetts	2,277 0 0	Ashby Bros.	1,670 0 0
			1,638 0 0

LONDON.—For the erection of a studio at Stewart's-grove, Chelsea. Mr. Alfred J. Bean, architect, 17, Southampton-street, W.C.:—

Carl Tabow	£745 0	T. Chapman	£714 0
Green & Green	717 0	W. Keen	704 0
C. Barrett	695 10	R. G. Bartley	679 0
G. W. Richardson & Son	670 0	Scrivener & Co.	668 0
Garratt & Son	660 0	R. Bartley	650 0
Rider & Son	645 0	Stewart & Co., Walworth*	597 10

*Accepted.

LONDON.—For alterations to Nos. 16 and 17, High Holborn, for Messrs. Payne & Son. Mr. Edward J. Paine, architect, 11, Great James-street, W.C. No quantities:—

Stimpson & Co.	£147	J. T. Bassano (accepted)	£340
E. Houghton & Son	134		

LONDON.—For additions and alterations to No. 170, Upper Brook-street, and 80, Park-street, W., for the Right Hon. the Earl of Shrewsbury and Talbot. Mr. T. Taylor-Smith, architect, 4, Cirencester-place, E.C. Mr. Henry Bushell, surveyor, 1, Finsbury-circus, E.C.:—

Lascelles & Co. (accepted, at per schedule of prices.)
[No competition.]

MORDEN.—For deep drainage of New Cemetery, at Morden, for the Battersea Burial Board

Geo. Bell	£4,265	Botterill	£3,360
Neave & Son	4,237	W. Cunliffe, Kingston-on-Thames (accepted)	3,153 15
King	4,234		

NEWCASTLE-ON-TYNE.—For rebuilding Falstone Church, North Tyne, for the Rev. R. Picton, R.N. Messrs. Plummer & Burrell, architects, 46, Cloth Market, Newcastle-on-Tyne:—

Middlemiss	£2,114	Cape & Son	£1,422 1 7
Brown	1,992	J. & J. Martin, & Welton, North Tyne*	1,319 11 10
Weightman	1,941 7 11		
Robinson	1,940 0 0	J. Ainsley	1,277 4 0
T. Craggs	1,921 17 7	W. Smith	1,275 7 11
F. Caldcleugh	1,864 0 0		

*Accepted

NEW FOREST (Hampshire).—For the enlargement of Milton Hotel, for Mr. Hugh Wyse. Messrs. John Colson & Son, architects, 45, Jewry-street, Winchester. Quantities by Mr. J. B. Colson:—

F. Hoare & Sons	£1,530	H. Stevens & Co.	£1,170 0 0
H. J. Sanders	1,375	Hammerton & White	1,14, 15 0
W. Hoare	1,293	Bull & Sons, Limited	1 135 0 0
Jenkins & Sons	1,188		

NEWPORT (Mon.).—For re-building the "Alexandra Inn," Commercial-road, for Messrs. Hall & Co., Limited. Messrs. W. G. Habershon & Fawckner, architects, Parade Chambers, Newport, Mon.:—

Wm. Price	£1,744	John Linton (accepted)	£1,620
W. M. Brabourn	1,747		

[All of Newport.]

NORFOLK.—For the erection of police-stations at Wells and Harleston, Norfolk, for the Norfolk County Council. Mr. T. H. B. Heslop, C.E., County Surveyor, Norwich. Quantities supplied:—

Wells.			
Sparks	£1,450	W. J. Larner	£1,164 12 6
Wimbers	1,279 10	R. Mayes, East Dereham	1,123 0 0
T. H. Blyth	1,198 0	Dain (accepted)	
Harleston			
Arthur Rayner	£598	Hy. Brett	£822 13 0
T. H. Blyth	581 3	A. G. Berry & Son, Harleston (accepted)	765 0
Smith & Watling	551 0		
Richard Mayes	529 0		

ORPINGTON.—For conservatory and greenhouse at private residence, Orpington, Kent. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C.:—

Conservatory.

Somerford & Son*	£191 15	Kinnell & Co.* (heating)	£29 15

Greenhouse.

Somerford & Son	£1,2 2	T. Knight*	£81
W. Owen	98		

*Accepted.

ORPINGTON.—For additions to shop and erection of stables at Orpington, Kent. Mr St. Pierre Harris, architect:—

Somerford & Son	£655 0 0

SHEFFIELD.—For the erection of a chimney stack 120 ft. in height, for Messrs. J. Gregory & Co., Deepcar, nr. Sheffield. Messrs. Fowler & Marshall, architects, George-street, Sheffield. Quantities supplied:—

Henry Freckingham	£140	Joseph Walker, Deepcar*	£105
John Woodward	130		

*Accepted.

SOUTH FEATHERSTONE (Yorks).—For additions to school, Back-street, for the Featherstone School Board. Mr. S. H. Gaskell, architect, Ackworth-road, Pontefract:—

Geo. Bird & Son	£2,116 6	Wm. Dean, Normanton (accepted)	£169 0 0
W. & L. Wilkinson	1,1 0 0		

TOTTERIDGE (Herts).—For additions and alterations to farm-house and buildings at Goldmans Farm, Totteridge, Herts, for Col. Price M. Wilmot. Wrightson, architect, 29, Bridge-row, Westminster:—

Phillips	£2,2[illegible]	[illegible]	£1,800
Courtney & Fairbairn	1,[illegible]	C. Bowman	1,771

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The Builder.

VOL. LXI. No. 2514 SATURDAY, APRIL 11, 1891.

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Berlin Street Architecture: The Werder-Haus Buildings.—Herr Alfred Messel, Architect ..... *Double-Page Ink-Photo.*
Cottage Hospital, Stanmore.—Mr. John F. Curwen, Architect ..... *Single-Page Photo-Litho.*
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The Disposal of Sewage from Isolated Buildings.

*II.**

WE will now give a few practical hints on the construction and mode of operation of some of the principal processes. A little consideration may first be given to one or two points, which are largely the same in all processes.

And first, as to storm-water. In the case of a new building, where the separate system of drainage is wholly or in great part adopted, little or no difficulty will be experienced in dealing with the rainfall, however great it be. It is conveyed straight to the river. But in the case of an old building, with only one system of drains, the outfall-works will often be overtaxed, and special preparation must be made for disposing of excessive rain.

A moment's consideration will reveal the difficulty. The mansion mentioned in our last article would, with its out-buildings, yards, and entrance-lodge, but exclusive of gardens and grass-plats, occupy an area of not less than 1,000 square yards. An inch of rainfall on this surface represents a total fall of nearly 4,700 gallons, and even if only two-thirds of this finds its way into the drains, it means that a volume of water more than six times the volume of the sewage, has to be treated at the outfall. To construct tanks large enough to contain such a quantity, would be a waste of money. But some provision must be made, or a chemical process will be for a time deranged; and, in the case of a land-treatment, the vegetables or other produce will be flooded and so damaged.

Several methods may be adopted for diverting the storm-water. One is the clever but simple arrangement shown in the adjoining diagram. The ordinary sewage, flowing at a moderate velocity along the drain A, falls into the pipe marked B, which conveys the sewage to the proper outfall, but the increased volume of water caused by a storm flows at a greater velocity, leaps over the weir at C, and escapes by the storm-pipe D. Full particulars of this arrangement for various gradients will be found in Latham's "Sanitary Engineering."

Another method is to allow the water to enter the tank as usual, and to arrange the tanks (which are always in duplicate) so that, when one is full, the sewage can overflow into the other; if both are filled, the sewage

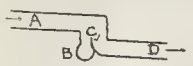


Figure 1.

overflows into a special storm-water channel. This arrangement is shown in Fig. 2, hereafter described. This method, of course, cannot be adopted in those cases where the tanks as soon as full are discharged automatically by syphons. In this event, the sewage is received in a small chamber from which it passes usually into one or other of the tanks; a storm-outflow is provided, a little above the ordinary sluices or openings, and when the drain is delivering a large volume of water, a considerable portion of it finds its way out of the chamber by this storm-channel.

In town-works, beds of osiers are frequently formed, and the storm-water is diverted into them. The osiers retard the flow of the water, and so assist in the deposition of the solids contained in it. Besides this, the osiers are rank feeders, and will not be at all damaged by having the lower part of their stems flooded for several days. These osier-beds ought not to have underdrains, as these would soon become choked by the long osier-roots.

Such beds offer, perhaps, the best means of treating the storm-water arising from isolated buildings which have only one system of drains, but where the separate system is adopted, as we propose here, they are not absolutely necessary, although they may on occasion prove useful.

A word or two about screening-tanks. In treating town-sewage, these are quite necessary; the number of pieces of wood, cork, rags, and other articles, which reach the outfall, is considerable, and as such things would be a source of annoyance, both in tanks and gutters, they are extracted from the sewage before any other treatment is attempted. The channels, by which these solids reach the drains, are the ventilating manhole-covers (the dirt-boxes under these being often full to overflowing), street-gullies, untrapped openings, dishes without grates, and even trapped openings. In a large town, there must necessarily be a number of such imperfections existing. In a new isolated building, however, we may well assume that the drainage has been carefully executed, that traps and grates are perfect, and therefore that the number of solids arriving at the outfall will be reduced to a minimum. Leaves may be excluded from the rain-water pipes, by means of roses placed in the heads.

We do not think, therefore, that screening is necessary for the sewage of small isolated buildings, especially if rain-water be in the main excluded. But for large buildings it may prove useful. There are several ways of accomplishing the object, perhaps the simplest being the suspension of a perforated iron pail in a small chamber adjoining the tanks; all the sewage flows into this pail, the solids being retained therein, and the liquid passing forward into the tank. Where fall cannot be obtained for this method, a vertical strainer, made of wire in an iron frame, may be placed across the small chamber. Sometimes a separate strainer is provided for each tank. The refuse collected by the strainer or in the pail should be dug into the ground, or covered with soil until required for garden purposes.

Another point to be considered is the necessity of storage tanks. These are, of course, an absolute necessity in all chemical processes, whether applied to the sewage of towns or of isolated buildings (Conder's iron process claims to purify sewage without the necessity of tanks, but of this we will speak hereafter). In treating large quantities of sewage, either by irrigation or filtration, however, storage tanks are not necessary, unless pumping must be resorted to. But the small amount of sewage arising from an isolated building, or even from a village, cannot well be treated by land without first being stored. The reason for this is that the sewage arrives at the outfall in such a small stream that, if allowed to flow at once upon the land, it would be absorbed within a few yards of the outfall, and this portion of the gutters would be overtaxed, while the remainder would not, per-

* See *ante*, p. 259

Figure 2.

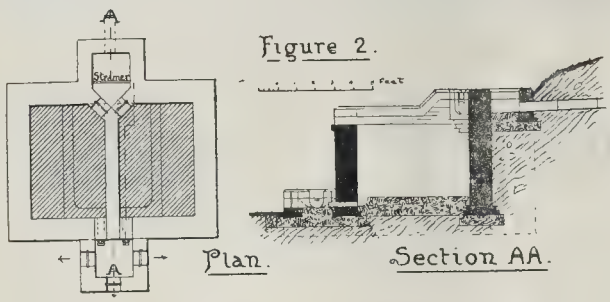
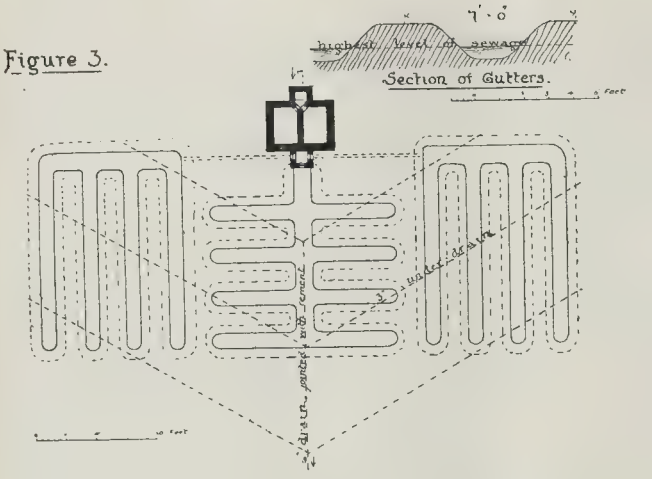


Figure 3.



haps, have been used at all. If the sewage be collected and discharged, say, once a day, every part of the gutters may be put into operation, the whole of the plants on the ground will be nourished, and a better effluent will be obtained.

A further advantage of storage-tanks is the diminution of smell. The sewage, stored in a tank, and having, therefore, a very small surface exposed to the air, will yield little or no offensive odour, and can be discharged upon the land at any hour of the day,—early morning, probably,—when there will be least danger of annoying the occupants of the building. Sewage continually flowing upon the land will be more likely to prove a nuisance, besides having the disadvantage mentioned in the last paragraph. Storage-tanks are frequently covered with wooden lids, in order to prevent the spread of smell as much as possible.

From this it will be seen that the cost of the various methods of treating the sewage of towns furnishes us with no criterion for estimating the cost of the same processes applied to the sewage of isolated buildings. Land-treatment has, for certain towns, proved remunerative, whereas in all cases chemical treatment involves loss. But for isolated buildings similar tanks are required for both modes of treatment, and practically the same amount of labour will be required daily in actually conducting the treatment. The cost of the precipitant must, of course, be added to the charge for maintenance of chemical processes, but it will be only trifling.

Figure 2 shows the arrangement of tanks for storing the sewage of the mansion previously mentioned. A small straining-chamber also is shown. Each tank will hold 650 gallons,—that is to say, each will hold 150 gallons of rain-water in addition to the maximum daily quantity of sewage,—namely, 500 gallons. An inch of rainfall on the gathering-surface of 78 square yards, neglecting absorption and evaporation, yields, we said, 365 gallons, and, consequently, such a fall will cause one tank to overflow to the extent of 215 gallons; this quantity will, therefore, be treated with the next day's sewage, which, in turn, will overflow to the extent of 65 gallons; and so on, until the normal condition of treatment has been regained.

The amount of rainfall which these tanks can receive, in addition to the sewage, without overflowing into the storm-channel,—assuming one tank only to be emptied each day—is $2\frac{7}{8}$ in. in one day, or rather more than $2\frac{1}{2}$ in. in two days, 3 in three days, or $4\frac{3}{8}$ in. in a week. With so much provision for rainfall, the storm-channel will seldom or never be required.

But where a natural treatment is adopted for the stored sewage, there is no reason why both tanks should not, after a storm, be emptied at the same time, over a somewhat larger area than usual. It will, therefore, be found sufficient in these cases to construct two tanks, each large enough to contain the maximum daily flow of sewage,—*i.e.*, 500 gallons; this will allow the addition of 500 gallons of rain to the sewage in a day, or $1\frac{3}{4}$ in. of rainfall, without causing any overflow into the storm-channel. The two tanks may be emptied together at the usual time, two series of gutters being used instead of one.

It is only when the tank-effluent has to be passed through prepared filters of limited area, that the quantity discharged each day must be kept within reasonable bounds, as, for instance, in the International process.

The tanks for chemical treatment ought, therefore, to be of the size shown in the figure. For another reason, each tank ought to be capable of taking an ordinary rainfall without overflowing, and that is because the precipitant is, as a rule, more active if the sewage with which it is mixed is absolutely still, and the overflowing of one tank into the other will therefore prevent, to some extent, the proper precipitation of the solids.

Very often the tanks are discharged automatically by means of a syphon, and of course this method has obvious advantages, but it is only applicable to sewage simply stored preparatory to land-treatment. It cannot be adopted for chemically-treated sewage, and it has this disadvantage for land-treatment,—the sewage will be discharged at varying hours of the day, and may often prove a nuisance to those occupants of the mansion who may be wandering in the vicinity of the tanks; whereas, if the tanks were discharged at a certain time every day, say, early morning, before the occupants of the mansion were astir, no nuisance could possibly arise. For this reason, a valve in charge of an attendant is a better though more troublesome arrangement.

The work involved in laying out part of an estate to receive by broad irrigation a small quantity of sewage, such as that from the mansion before-mentioned, may be very little; in fact, simple furrows, made with the spade or plough, may be all that is required. In most cases, however, the land must be under-drained 4 ft. deep or more, and the principal carrier is usually formed with socketed stone-ware or concrete channels. From the main carrier the sewage can be turned by means of sluices to flow into any of the branch carriers, which are usually simple furrows about 9 in. deep and nearly the same width. These furrows may be ten or fifteen yards apart, and on gently-sloping ground they may be cut nearly in the direction of the greatest fall, provided that the gradient of the furrow does not exceed 1 in 20. At intervals along the furrows small movable stops of wood or sheet iron or slate are fixed by the attendant to check the flow of the sewage, and, in fact, transform the gutter into a series of long narrow pools. By this means the sewage is given full opportunity of spreading laterally among the roots of the herbage.

On steep ground, the furrows are cut to follow nearly the natural configuration of the surface, having, however, a small inclination, say, 1 in 300. When the uppermost carrier is filled, the sewage overflows the lip of the carrier and spreads down the slope, until it reaches the next one, and so on. Arrangements are made, however, for turning the sewage into any of the lower carriers or grips, so that the upper portion of the irrigated land may have rest and be re-oxygenated. Stops are placed where necessary, as in the ridge and furrow system. The arrangement just described for steep ground is known as the contour or catchwater system.

On flat ground, great care must be taken to prevent the accumulation of the sewage in ponds; this can best be effected by forming the ground between each pair of furrows with a convex surface, similar to the surface of a road.

The furrows stop short of the pick-up carrier, which runs along the bottom of the irrigated plot,—sometimes even 50 yards from it,—so that the sewage has a considerable distance to spread before it reaches the carrier. For small quantities of sewage, and also for light soils, the pick-up carrier may be dispensed with, the under-drains being sufficient to take all the moisture not absorbed or evaporated.

In light sandy soils, it will be found necessary to form the carriers with turf, as otherwise the flow of the sewage will wear away the sides and so destroy the carriers.

The underdrains are sometimes two-inch, but more frequently three-inch agricultural drain-pipes, carefully laid with uniform fall, and connected with larger mains according to the size of the irrigated area and the quantity of sewage poured upon it. Their distance apart varies according to the nature of the soil.

The irrigated land may be utilised for growing rye-grass, turnips, wheat, and, in fact, nearly everything which farmers and market-gardeners cultivate. It is sometimes used as a pasture for cattle; part of the Croydon sewage-farm is let to a dairyman.

But the cattle ought not to have access to any portion of land actually under irrigation, and not indeed to any portion until some days have elapsed since it has been treated with sewage.

The flat-bed system of irrigation is not now recommended. In this system the land was divided into a series of level beds, each surrounded by a low bank of turf; into this tray-like space the sewage was turned, and there it was allowed to settle, the effluent passing off by under-drains 5 ft. or 6 ft. deep.

Intermittent-filtration works require greater preparation, but about four-fifths, or nine-tenths, less ground than broad-irrigation works. The ground must be deeply underdrained, certainly not less than 5 ft., deep, and preferably more; sometimes the underdrains are 7 ft., and even 9 ft. deep. If there be too little earth above the drains the effluent will be impure, on account of the small thickness of the filtering medium; and the sewage may even percolate to the drains so quickly as to carry with it large quantities of sand and soil, and so tend to destroy the ridges and furrows. The under-drains may be as described for irrigated land, but closer together,—that is to say, from five to ten yards apart. Care must be taken that the under-drains run across the gutters, and not immediately under them in the same direction.

The surface of the ground is laid out into ridges and gutters, usually 6 ft. or 7 ft. from centre to centre, the gutters being about 1 ft. 6 in. deep. The best arrangement of gutters is one with a main gutter, from which shallower ones branch at right angles; the maximum depth of sewage in the main gutter is about 9 in., and in the branches 6 in. The chief deposit of silt or sludge takes place in the main gutter, and when this is sufficiently dry it must be lifted and dug into the ridges.

As before stated, at least two, and preferably four or five sets of gutters must be formed, so that the necessary intermittency of action can be insured.

On steep ground it will be necessary to form a series of terraces, so that each system of gutters may be level.

The ridges may be planted with cabbages, turnips, potatoes, and other market-garden produce, including even strawberries; in fact, the filtration area may be the kitchen-garden of the house.

Fig. 3 shows a scheme of intermittent filtration, for treating the sewage of the mansion before mentioned. The ground measures 13 perches, and is laid out in three beds. The under-drains are from 6 ft. to 7 ft. deep, and 5 yds. apart. Each bed has an area of about 130 square yards, and each filtering medium, reckoning it to be 2 yds. in depth, contains, therefore, 260 cubic yards. This has to receive in one day 500 gallons of sewage, or nearly two gallons per cubic yard. On a rainy day, it will receive from the tank 650 gallons, or two-and-a-half gallons per cubic yard, and, in addition to this, it will receive the actual rainfall on its own surface, which, if we assume 1 in. as the largest fall to be provided for, will be four gallons and three-quarters on each square yard, or nearly two-and-a-half for each cubic yard. This will give a total of very nearly five gallons per cubic yard as the maximum daily quantity which the area will be required to purify; the average daily quantity, however, will not reach three gallons per cubic yard. It is usually said that a cubic yard of suitable porous soil will satisfactorily purify five gallons of sewage in a day; consequently the filtration beds shown in the figure, err, if at all, on the safe side.

It will be seen that the sewage, on being discharged from either of the tanks, enters the small sluice-pit, from which it can be turned by sluices to flow into any one of the three beds. On steep ground it might be necessary to place the tanks at the highest corner of the plot, and to convey the sewage from the sluice-pit to the different series of gutters, in drain-pipes or stoneware channels.

Sometimes osier-beds are formed to receive the whole of the sewage of an isolated building or even of a village, and this mode of treatment achieves good results economically. Under-drains, as before stated, must not be laid in osier-beds, but in place of them each bed must be separated from the adjoining beds by deep ditches, into which the liquid portion of the sewage can percolate, and by which it can be carried to the nearest stream, or to a line of pipes communicating with the stream. The surface of the ground may be laid out in various ways; sometimes ridges and gutters, similar to those used in intermittent filtration, are adopted; and at other times the surface of the bed is level, and surrounded by a rim of turf a few inches high, as in the flat-bed system of irrigation. Intermittency of action is as necessary for this as for any other method of land-treatment.

Until quite recent years, no other than land-treatment has been advocated,—at any rate with any success, for isolated buildings. If sufficient land has not been available for the surface-disposal of the sewage of such a building, two alternatives only remained,—sub-irrigation and cess-pools. The latter ought only to be used as the very last resource, and the former mode of treatment, although it has been adopted in several instances in close proximity to buildings, is not a very good method. The drains by which the sewage is passed under the ground become choked with filth in a year or two, and must be opened out in places, so that the whole can be cleaned by passing canes or other implements through them from opening to opening; and this certainly is not a very savoury procedure.

Nowadays, however, there are at least two chemical processes, which have been adopted for isolated buildings with manifest success; these are the International Process and Conder's Iron Process. The whole process of purification differs in these two methods, from the application and action of the precipitant to the completion of the treatment. It will therefore be necessary to describe both somewhat in detail.

Of course, other modes of chemical treatment have been tried in connexion with isolated buildings, but these two possess several advantages, which render them more uniformly suitable for such structures. The system in use at the Lodge Moor Small-pox Hospital, Sheffield, may perhaps be mentioned. See fig. 4. In the large copper at A, a quantity of permanganate of potash is dissolved, and the solution feeds the two-gallon closed cistern at B; the sewage enters the large tank at C, and when this is nearly full, the contents of the small cistern are discharged automatically into the tank and disinfect the sewage therein; the large tank is then emptied by means of an automatic syphon, into the tanks marked

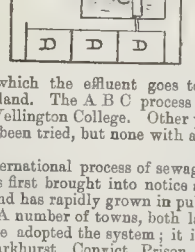


Figure 4.

D, from which the effluent goes to irrigate adjoining land. The A B C process has been used at Wellington College. Other processes also have been tried, but none with any great success.

The International process of sewage purification was first brought into notice at Acton in 1887, and has rapidly grown in public estimation. A number of towns, both large and small, have adopted the system; it is also in use at Parkhurst Convict Prison, Isle of Wight, at Powis Castle, Welshpool, at Larbert Lunatic Asylum, Stirling, and at other places. The purity of the effluent has won high commendation. Sir Henry E.

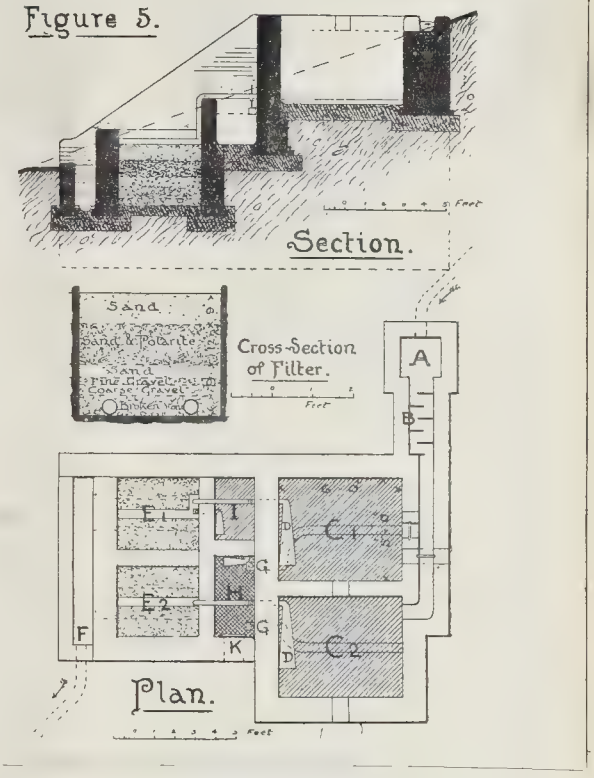


Figure 5.

Roscoe, in August, 1888, reported that the effluent passing from the filter-beds at Acton; after they had been in continuous use for fourteen months, was "bright, clear, and colourless, and free from any objectionable smell." Mr. Carter Bell, the Borough Analyst of Salford, analysed the effluent from the experimental works at Salford in August, 1890, and reported, "This is a first-class effluent; many well-waters in the country are not so pure as this." The International, the Electrical, the Aluminoferric, and the Barry systems have all recently been tried at Salford, in order that the Corporation may have actual evidence before them in selecting a system of purification. The sludge formed by the International process was found to be as 1 to 2·46 in comparison with that produced by using lime as precipitant. The effluents from the International and Electrical systems, said Mr. Carter Bell, at the beginning of this year, "are very good; they were all bright, clear, and colourless, and remained so for weeks, not giving off the slighest odour of decomposition." Dr. Frankland, Prof. Macadam, and other eminent sanitarians have passed high encomiums upon the process.

The quantity of precipitant added to the sewage is smaller than in most other chemical processes, but larger than in Conder's iron process, and the sludge produced is less with the same exception. Ferozone, the precipitant employed, is not expensive, the cost being from 20s. to 30s. for a million gallons of sewage.

Fig. 5 represents the works required for treating the sewage of the mansion previously mentioned, according to the International method. The tanks are of the same capacity as those shown in fig. 2, namely, 650 gallons. As already stated, any excess of rainfall on one day over the capacity of the tank in use for that day will overflow into the adjoining tank, and must be treated on the following day. In conjunction with the two tanks are two filter-beds, each having an area of 1½ square yards, and these, like the tanks, are used on alternate days. A straining-chamber may be formed, when necessary, on the higher side of the mixing-pit at A.

The mode of treatment is as follows:—In the mixing-pit, at A, a perforated hopper of galvanised iron is suspended, and in this a certain quantity of "ferozone," varying from five to eight grains per gallon of sewage, is placed every day. The sewage flows around the hopper, and gradually dissolves and carries away the ferozone: the thorough mixture of the precipitant with the sewage is effected by the baffling-plates at B, past which the compound flows on its way to the tanks C_1 and C_2. By means of sluices, either of the tanks can be made to receive the sewage. When one tank is full, or, rather, at a certain hour every day, whether the tanks be full or not, the incoming sewage is turned to flow into the second tank, and that in the first is allowed to stand for two or three hours, during which time the solid matter will be deposited as sludge at the bottom of the tank. The liquid floating above the sludge is drawn off by the floating arm at D, and allowed to flow over one of the filter-beds, E_1 or E_2; in order to prevent the sand of the filters being washed away, the liquid passes into a trough laid along the centre of each filter, and from this trough overflows gently upon the sand. The effluent from the filters is carried away by the drain, F. When the clarified liquid has been drawn from the tank, the valve at G should be opened, and the semi-fluid sludge conveyed to the pit, H, provided for it.

The solid matter in the sludge in H will gradually settle there, and when the pit is full, the liquid can be drawn off into the small tank at I, and there further treated with ferozone; the liquid arising here will pass by the floating arm on to the filter-bed E_1, and the sludge must be lifted back into the sludge-well H.

The quantity of sludge which may be expected to be deposited from 500 gallons of sewage, is little more than one cubic foot, and by the further settlement in the sludge-well, its bulk will be reduced about one-third. If the sludge-well have a capacity of eight or ten cubic feet, it will hold the sludge arising from a week's sewage; the liquid portion of this may then be drawn off into the small tank, and the remaining sludge must be taken out by lifting the penstock at K, and may be dug into the adjoining land, after the liquid has largely evaporated and drained away.

This arrangement can only be adopted where considerable fall can be obtained. In other cases, the sludge-well and the filter-beds may have to be on the same level, and the liquid arising from the sludge must be pumped back into the large tank or into the outfall sewer above the mixing-pit A.

The cost of a sludge-well may be avoided by taking the sludge directly from the precipitating-tanks into shallow lagoons on the land, and allowing the water rising from the sludge to drain off on the land.

The tanks are formed with concrete bottoms having smooth floated surfaces, laid to fall to central gutters, which should have a somewhat rapid inclination down to the outlet-valve. The walls are of brickwork in cement, and may be faced inside with salt-glazed bricks; in any case, the bricks used should be dense, and as little absorptive as possible. The filter-beds are 3 ft. thick, and are formed with layers of sand, sand and polarite (mixed in equal proportions), gravel, and broken stones, in the last of which 4 in. agricultural drain-pipes are laid to convey the effluent into the outfall-drain. The surface-sand of the filters becomes in time somewhat foul, and should therefore occasionally be raked over, and replaced with clean sand when necessary.

The ferozone, which is used to deodorise and precipitate the sewage, consists mainly of sulphate of iron and magnetic oxide of iron; and the polarite, used in the filter-beds, has for its chief constituents magnetic oxide of iron and silica. It is said that the polarite in the filters is practically everlasting, and merely requires short intervals of rest to keep it thoroughly active. For this reason the filters are in duplicate, each having alternate days of work and recreation. The annual cost of the ferozone required in treating 500 gallons of sewage a day, is about 5s. The polarite costs about 14s. for each square yard of filter-bed: that is to say, in this case two guineas. It will be seen that the cost of the chemicals used in this process is very small, and the treatment, which includes both precipitation and filtration, is carried out on a very small area of ground.

For the treatment of 1,000 gallons of sewage daily, two precipitation-tanks will be required, each to hold 1,200 gallons, and two filter-beds, containing each 2 square yards; for 10,000 gallons, two tanks holding 11,000 gallons each, and three filter-beds of 6 square yards each; and for 20,000 gallons, two tanks holding 22,000 gallons each, and three filter-beds each containing 10 square yards.

The last process which we shall describe is Conder's iron process. It was introduced about five years ago, and, unlike the International system, which has been used chiefly for large quantities of sewage, as from towns, this has been applied mainly to the sewage of isolated buildings, and in only a few instances to larger volumes. The chemical employed is sulphate of iron, and may be added to the sewage in one of two ways, either by means of ferrometers, one of which should be placed inside the building, close to each w.c. apparatus and sink, or by means of a small dissolving-tank at the side of a manhole just outside the building. The former method is in use at Windsor Castle, Buckingham Palace, Alnwick Castle, Hatfield, Crossley and Porter Orphanage at Halifax, Infirmary at Ayr, Eagle House School near Reading, and at many country houses; the latter method has been adopted at Chichester Barracks, Eastney Barracks, at Grange-over-Sands in Lancashire, and in part of the borough of Halifax.

By the former method, the chemical is added to the sewage at the very commencement of the drains, and by the latter, as near the commencement as possible, and this is in one respect a great advantage, as the sewage is rendered innocuous immediately after its production; in hospitals for infectious diseases, the value of such a disinfectant (for sulphate of iron is a good disinfectant) regularly applied is obvious. A disadvantage, which cannot be dissociated from the foregoing advantage, is that the silt produced by the action of the chemical will have a tendency to settle in the drains. It is said that a flow of half a mile an hour, or ·73 ft. per second, is sufficient to carry the silt along; this, we fear, is somewhat misleading, as a gradient of 1 in 1,700 is calculated to produce such a velocity in 6-in. pipes flowing half full, and of 1 in 1,200 in 4-in. pipes, and after making a large allowance in order to make up for the loss of speed caused by bends, the gradients would still be ridiculously small. Probably an inclination of 1 in 60 would be sufficient to keep house-drains free from deposits.

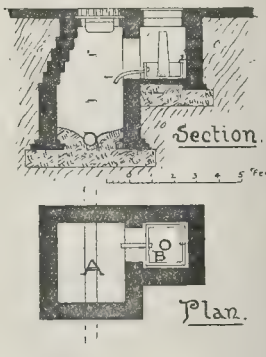
The ferrometer consists of an upright glass tube, in which the sulphate of iron is placed, and the perforated bottom of this tube dips into a porcelain cup, to which a small but regular supply of water is conveyed. In the cup half the skin of a lemon or orange is put, and this is replaced by a fresh piece once a week or when it ceases to float. The chemical is gradually dissolved by the water, which is regularly trickling into the cup, and the solution overflows and passes down a pipe into the trap of the water-closet or sink. This pipe needs occasional cleaning with a wire brush, as a slight deposit of oxide of iron takes place in it under certain conditions.

One pound of sulphate of iron is considered sufficient to disinfect for one person for a month, and the ferrometer can be regulated to dissolve more or less, according to circumstances; this is effected by means of set-screws, which regulate the depth to which the glass tube dips into the cup. The quantity of water required to dissolve the chemical is about one gallon a day for each person.

The mansion and lodge previously mentioned would require for their eighteen occupants about 2 cwt. of sulphate of iron per annum, which would cost from 12s. to 18s. (according to quality) if bought by the cwt., or about £3. 5s. if bought in boxes, each containing a charge for 100 days for one person.

The other method of applying the chemical is similar in principle to the one already described, but differs in detail. It is employed in immediate connexion with the drains themselves, and not with the internal fittings of

Figure 6.



the building. Fig. 6 shows the usual arrangement. Adjoining the manhole, A, is a small chamber containing a glazed earthenware tank, B, in which stands a cone of similar material, with perforations around near the bottom. The cone is filled with sulphate of iron, and a small stream of water, turned into the tank, dissolves this, and the solution over-

ows into the sewage-channel of the manhole. he quantity of water required will be rather ss than a quart a day for each person. Half lemon should be placed in the tank and newed when necessary.

Immediately on its union with the sewage, e chemical begins its work of disinfection, odorisation, and precipitation; and after a w of a quarter of a mile or of about four inutes' duration, the work is complete. here such a length of flow is not obtainle, the sewage must be discharged into a nk, so arranged that the contents may be pt in a state of agitation by the incoming wage; in this process, unlike other chemical ocesses, quiescence is not desirable.

It is said that after the length of flow just entioned, the sewage, consisting of a clear uid and a fine black silt, is quite innocuous, d may be turned at once into a river; cerinly this course would be good enough if e quantity of the sewage were small in nparison with the volume of the river-ter, but otherwise, further treatment ought be adopted. Settling-tanks in duplicate, newhat similar to those shown in fig. 5, ould be constructed, in which the silt n be deposited; the liquid can be drawn off a floating arm and conveyed to the stream in exceptional cases passed over land, and silt can then be swept out, and, after liquid in it has to some extent evaporated drained away; can be dug into the land spread upon it as manure.

The use of sulphate of iron as a sewage-cipitant is no novelty; it was tried at rthampton twenty-five years ago, and led in its object; but Conder's process fers in one or two points from previous plications, and possibly these differences count for the success which has so far ended it. Professor Maguire, in his book "Domestic Sanitary Drainage and Plumb-" (1890), thus writes:—"Sulphate of iron loubtedly effects powerful action on sewage-tter in a dark drain. Whether it altoher destroys whatever is putrescible in age-matter, or only delays the process of refaction, is a question the writer cannot ve." Certainly we think that further atment, as mentioned in the last paragraph, desirable; but there cannot be two nions as to the utility of a process which s, either for a time only or altogether, take y from sewage its evil properties at its y formation, and so prevents the spread of ious gases in our buildings, and the forion of sewer-gas in our drains.

EGISTRATION OF PLUMBERS.—Mr. T. N. rews (secretary) and Mr. W. N. Elliott (master mber) attended a public meeting in Penzance on 25th ult., as a deputation from the Plymouth rict Council to explain the objects of the onal registration system. The Mayor presided, there was a large attendance of trade repreatives, the following being elected on a Local mittee to carry out the system in Penzance:—srs. Mowatt, T. H. Stewart, R. Kemp, H. mas, J. Thomson, and O. Caldwell. —At the ual meeting of the Hull District Council Dr. burn, J.P., was re-elected president, and srs. T. B. Holmes, Councillor Cohen, and Dr. on, D.P.H., vice-presidents. The annual rt of the hon. treasurer (Mr. A. E. White,), was adopted. The Council decided to ask members of the trade for tenders for the rial made up by the students at the practical uction classes. A letter was read offering, on alf of the Plumbers' Company, prizes and ificates to successful students. Pocket certifi-s were decided to be issued to registered abers yearly for production when required. — he last meeting of the Munster District Council, ork, it was resolved:—"That a sub-committee ppointed to wait on the Corporation, and urge hem the necessity of appointing a properly fied plumber for the purpose of inspecting the ally arrangements of the houses in the City."

E SOCIETY OF ENGINEERS.—At a meeting of Society of Engineers, held at the Town Hall, minster, on Monday evening last, Mr. W. N. n, President, in the chair, a paper was read by T. B. Lightfoot on "A Trial of a Refrigerating hine on the Linde System." The author deed the construction and arrangements of a ng station for refrigerating machines that had recently built at Munich, and gave the results test trial with a refrigerating machine on the e system.

NOTES.

IT is with the greatest regret that we have to record in another column the unexpected death of Mr. John D. Sedding. He was one of the most really original minds among contemporary English architects; one of those who was never content to work in the ordinary fashion of the day, but always had his own impress to give to a building; and he was one of those who really felt the art of architecture as a form of poetic creation, not a mere system of planning and construction. He was strongly impressed with the feeling that this creative and artistic element could be realised in pure architecture, without any adventitious aid from painting or sculpture; his paper on this subject read at the Edinburgh Art Congress in 1889 was an eloquent exposition of this view, which he has practically illustrated in many most picturesque buildings; not that he was indifferent to the unity of the arts, but he realised the fact that architectural design had its own special field, and was not necessarily dependent on assistance from "handmaid" arts. In his passion for individuality he was sometimes led into what might be called eccentricity in architectural design, but it was eccentricity not without a charm of its own. His comparatively early death,—for according to the ordinary term of life he might yet have been among us for many years,—is a serious loss to English architecture; but by the many who knew him he will be even more missed as a man than as an artist. It is not too much to say, and we are sure many of our readers will echo the sentiment, that to know John D. Sedding was to love him. He was one of the most simple-hearted, genial, and kindly of men, absolutely without pretence or vanity, and one of those few to whom it is given to preserve in mature life all the enthusiasm and buoyancy of youthful feeling.

IT is worth note that the memory of the deceased Vienna architect, F. von Schmidt, is being honoured outside Austria, and especially at Berlin. Not only have there been memorial celebrations to the deceased held under the auspices of the architectural societies, and an exhibition of some of the deceased's wonderful examples of draughtsmanship opened, but also a subscription started, in connexion with the Austrian one, for the purpose of erecting a monument to him, in form of a statue, at Vienna. In the invitation to subscribe, special note is taken of the fact that the late artist has left a name and many an architectural monument that will outlive any statue raised, and that the proposed sculptural monument is to be placed solely as a tribute of esteem by the members of his profession.

THE passing of the second reading of the Public Health (London) Law Amendment and Consolidation Bills can only be regarded with satisfaction in the main, whatever details may be susceptible of improvement. In regard to the duty now put upon a houseowner or occupier of cleansing the foot pavement in front of his house, the criticism that this duty ought to fall on the locality and not on the individual is no doubt perfectly logical in theory, but we concur with Mr. Ritchie in thinking that the existing arrangement has great advantages in practice, in dividing the labour and providing for a much quicker and more economical cleansing of the footways than would be at all possible if it were left to the local authority, while it cannot be said that the duty imposes any great hardship or expense on the individual householder. Mr. Isaacson's proposal that there should be a provision inserted to prevent auctioneers and house-agents from letting insanitary houses would probably be, as Mr. Ritchie said, impracticable in working, if the sanitary authority were to be expected to undertake a prior inspection in order to see that this condition had been complied with. But we do not see why the house-agent should not be compelled to "attach to the agreement entered into a document stating that the house was in a good sanitary condition and fit for habitation," as in doing so he would take on himself the legal responsibility of seeing that the house was in such condition, and if it were otherwise it would be at his peril; the lessee would at least have a legal remedy against him, and the agent would find it his interest to see to it that there should be no ground of complaint that the house was insanitary. We hope therefore that this suggestion will not be lost sight of in considering the Bill in Committee.

THE Committee which will consider the important Bill of the Manchester, Sheffield, and Lincolnshire Railway has been nominated, and will begin its sittings next week. The Committee is, perhaps, above the average in general capacity, but is not remarkable for its purely business characteristics. The Chairman is Mr. W. Woodall, best known to the public as a leading advocate of woman's suffrage, and a manufacturer in the Midlands. Sir George Baden-Powell is a young Conservative politician of energy and capacity, who has given much attention to colonial subjects. Sir E. Grey is also a "coming" young man of the opposite camp. Mr. Wilson Noble is already known to many of our readers in connexion with a Bill of which he has charge. We cannot, however, but think that another member of high commercial standing might, with public advantage, have taken the place of one of the two last-named members.

AN unsatisfactory discussion took place on Monday evening, in the House of Commons, in regard to various Royal palaces. It was unsatisfactory because those who attacked the votes did so, not in a spirit of rational criticism, but in a quite heedless manner, as when Mr. Labouchere stated that Kensington Palace ought to be pulled down. Reasonable criticism, both of the condition and the management of these palaces, is useful and proper, but there appears to be no mean between wanton attacks and official defence. As regards Kensington Palace, Mr. Plunket could only say that it was in a fairly good sanitary state, which is a kind of half-hearted defence, such as in the mouth of an official is suggestive. Again, as regards Kew Palace, which Sir George Trevelyan rightly said was an interesting historical monument, there is a good deal to be urged against the thousand pounds of public money being spent upon it unless it is used for some public purpose. In the same way, however courteous it may be to allow the Duc de Nemours to occupy Bushey House, it is naturally a subject of reasonable criticism. The fact is, that these unused Royal residences should now be used for purely public purposes, such as museums and so forth.

A MELANCHOLY interest attaches to the Report for 1890 of last year's excavations at Troy, just issued by Madame Schliemann. In her brief preface to the Report, Madame Schliemann states that her husband had fully intended to begin work again in March of the present year. It now devolves on the devoted wife herself to complete the excavations, and, as a necessary preliminary, to edit the report of last year's undertakings. This falls into two portions,—a narrative by Dr. Schliemann himself, relating, with the usual rather tiresome prolixity, the troublesome Bötticher controversy (which had, indeed, one profitable result, that it impelled the reopening of the excavations), the visits to the site of illustrious persons, the general journal of the excavations, and a chapter on the inscriptions found. To this follows a supplement by Dr. Dörpfeld, discussing the architectural problems arising from the new work, a discussion illustrated by a revised plan. The excavators confined themselves on this occasion to elucidating the plan of the build-

ings found in the second stratum. Even with this restriction, the plan is complex enough. For within the limits of this second stratum buildings of no fewer than three periods occur; the periods are indicated on the plan by different cross markings. The details of the discovery can only be followed in connexion with this plan, but it may be noted that the main new points of interest established are: 1. The existence of *a third* system of walls inside the other two previously known. 2. The plan of a propylon which exhibits in its simplest form the main outline of, *e.g.*, the Athenian Propylæa, *i.e.*, a wall broken by a door faced and backed by a porch. 3. A building, whether megaron or temple Dr. Dörpfeld does not decide, but which might well be either, and which goes to show the common structural origin of both.

IN the course of a paper recently read at the Berlin Architekten Verein, by Professor F. Adler, on the results obtained at the Olympia excavations, it was stated that the original idea of having the excavations made emanated from Professor Curtius, who at the time proposed his scheme to the Crown Prince, afterwards Emperor Frederick III. It was mainly due to the Crown Prince taking the matter seriously and very energetically in hand that, soon after the formation of the German Empire, notes were interchanged on the subject between the Imperial Government and the Greek Cabinet, and that after a long correspondence the arrangement was come to that, if the excavations were made, all the original pieces of sculpture found should be Greek property; that Germany should, however, have the sole right of making casts and issuing publications. Alluding to figures and dates, Professor Adler mentioned that after the first sod had been turned on October 4, 1875, the six separate excavations made brought to light no less than 130 statues and busts, 14,150 bronzes, 40 buildings, 1,000 larger fragments of architectural work, 6,000 coins, and some 1,500 smaller objects.

IN a paper read at the Surveyors' Institution on Monday last, on "The Present Work of the Land Registry," Mr. C. Fortescue-Brickdale, Assisting Barrister to the Land Registry, drew attention to the advantage of making use of the system of public registry in the sale of landed property, as doing away with the immense expense and trouble of proving the titles of landed property. He mentioned one case in which, for the sale of an estate the value of which was under 5,000*l.*, the number of deeds and other documents in the abstract was ninety-one, and the abstract and deeds, stitched into a band 3 ft. wide, would have reached from the cross of St. Paul's to the floor of the Cathedral. The only remedy, he urged, was to establish a public registry with power to record changes of ownership in such a way as to preclude enquiry into any past transaction. He pointed out that this had been successfully done in Australia and in Prussia for several years, and the system had lately been begun in Austria. In England, he added, such a registry had been in existence for some time, but is not yet as well known as it should be. Its offices are in Staple Inn. The subject is, of course, strictly speaking a legal one and does not affect architecture or construction, but it may have an important indirect effect in facilitating the transfer and development of building estates.

FROM a circular which we have received from the Dundee Institute of Architecture we learn that a suggestion has been made to the Council of that Institute to the effect that an alteration is desirable upon Article VI. of "General Conditions of Contract," agreed to by the architects and builders of Dundee and vicinity in 1884. The proposal, we learn, "arises from the fact that this Sixth Article makes no provision for payment of the expense of re-measurement, and thus the way is open for either party to embarrass the other by groundless allegations of deductions from or additions to the schedule of quantities." An addition is therefore suggested as follows,—viz.:—"And in case of re-measurement having to be resorted to, the party failing to establish 50 per cent. of the value of the matters in dispute shall bear and pay the actual cost incurred by such re-measurement, such payment to be made out of the most readily available moneys under the contract." Means are being taken to elicit the opinion of the professional members of the Institute upon the subject.

A CURIOUS and important case is reported in the current number of the Law Reports. It is that of Turner *v.* Goldsmith. The defendant, who was a shirt manufacturer, made an agreement in writing with the plaintiff that the latter should serve the former, as agent, canvasser, and traveller on the following terms: first, that the agency should be determined by either party at the end of five years by notice; secondly, that the plaintiff should do his utmost to obtain orders for and sell the various goods "*manufactured or sold* by the defendant as shown from time to time by sample or pattern to him." After about two years the defendant's manufactory was burnt down, and thenceforth the plaintiff was no longer employed. Consequently he brought an action for damages for breach of contract, and the Court of Appeal held that he was entitled to recover them. This appears at first sight to be a "hard case," and we are by no means sure that it is not so in reality. If the defendant's factory was burnt down, obviously, he could not have the plaintiff's articles to sell. But in the contract appear the words "sold by." These it were which were the turning-point of the decision. It has been held that if a particular thing is in the contemplation of the parties to be in existence as the basis of a contract, then if that thing ceases to exist the contract is at an end. But here the Court considered that the words "sold by" showed an intention to employ the defendant to sell articles other than those manufactured by the defendant. Of course, the moral of the case is that manufacturers and canvassers should be very careful as to the terms of these contracts, and that each side should insure their interest under them.

WE have received from Messrs. Gritten & Parmley some particulars of their "patent fire-proof plaster casing for electric light leads." This casing is made of plaster well incorporated with slag wool, can be made to any particular design, to curves of any shape, and is adapted for application to the ornamental panellings of ceilings and walls, no matter how rich the mouldings may be. Perhaps the most important property claimed for this material is that it will insure absolute insulation and non-conduction of heat. A consideration that frequently makes people hesitate about having the electric-light installed in their houses, especially when the decorations are of a costly character, is the fact that no provision whatsoever having been made for the electric-light wires by the architect, the cutting-out and making good will not only frequently raise the cost of an installation to a prohibitive sum, but permanently disfigure the rooms into which they are introduced. Latterly one or two firms of decorators have endeavoured to induce builders to use skirtings, dado rails, picture rails, and cornices in which grooves have already been made, with ornamental covers easily removed for the introduction of the wires, should they be required at any future time. Until recently, we believe, this has only been done where wooden casing could be used, and it will certainly be a great advantage if Messrs. Gritten & Parmley can introduce the use of plaster casing, which would not differ in appearance from the mouldings and cornices now universally employed. It seems doubtful, however, if plaster can replace wood for ordinary casing, owing to its weight, brittleness, and other defects incidental to working with it, though in situations where it can be used it will unquestionably enormously reduce risks of fire through the accidental heating of the electric light mains through a cause.

IN reference to the subject of the disposal of sewage from isolated buildings, treated of in this and the preceding number, a correspondent describes a method of dealing with the sewage of a detached country house which, he says, works satisfactorily. The house is situated on rising ground, and on low-lying portion of the ground a space about 14 ft. square is surrounded by a wall 8 ft. high. Entrance to this enclosure is by a close gateway at one side, and within the enclosure is placed an iron tank, upon a truck, and into this tank the sewage from the house is drained. Disinfectants (chiefly sifted ashes and dry soil) are thrown into the sewage from time to time, and when the tank is nearly full it is removed, and emptied in places where the sewage can be utilised as manure. During the time the tank is out of the enclosure, which is never for a lengthened period, the end of the drain-pipe is closed, so as to prevent any escape in the interval. The drain is ventilated by an open grating. The rainfall does not flow into the tank, but is directed elsewhere. The enclosure is situated in the most unobtrusive position that could be found, and is surrounded by a belt of trees and shrubs.

ADVERTING to our "Note" of last week, we find, upon inquiry, there can be very little doubt that the Westminster Life Office, designed, in 1832, by C. Cockerell, is No. 429, Strand, by the corner of Agar-street. It is conspicuous for a bold façade having two central Doric fluted columns, engaged, over which is a frieze and cornice carried along the return, the former having portcullises (the Westminster badge), wreaths, and anchors between the triglyphs. In the spandrils of each of the three front first-floor windows are two figures in high relief. A lion with the union-shield stands in the central compartment of the second-floor, above are a light pediment, and attic. This is the house, occupied some thirty five years ago by the inglorious Royal British Bank, since by the Briton Insurance Company and now by the British Medical Association and *Journal*, whose sale and interior alterations we described in our columns on August 21, 1886, and February 19, 1887.* Who surveyor of St. Paul's, for which he set up new ball and cross (1821), Cockerell had offices at No. 8, Old Burlington-street. He died at No. 13, Chester-terrace, Regent's Park on September 17, 1863, and was buried by the side of Rennie, his father-in-law, and near Wren, in the cathedral crypt. His figure will be found between those of Pugin and Barry in the Albert Memorial. And let us not forget that, in addition to the fine volumes where he enshrined the results of his travels in Sicily, Greece, and Asia Minor, we possess another "memorial" of his labours,—the reliefs of the frieze of the Temple of Apollo the Deliverer, at Bassæ near to Phigaleia in Arcadia, which, with the sculpture, now in Munich, of the Temple of Jupiter Panhellenius in Ægina, he discovered in 1811–12, and which the State purchased for 19,000*l.* in 1815–6. The Phigaleian marbles are now arranged in what used to be the Print Room at the British Museum, and there are his drawing for the restoration of the west pediment of the Parthenon and a copy of his very rare print, conceived at Florence in 1816, with a MS. title: "Congettura di Signor Cockerell sopra la Famiglia di Niobe."

NEXT June the late Mr. Money Wigram's executors will offer Esher Place for sale at the Mart. Within the beautifully-timbered grounds stands, by the River Mole, a gat

* In his article in the "Dictionary of National Biography," Mr. Louis Fagan says that Cockerell designed the Westminster Fire Office [No. 27], King-street, Covent Garden. That Company, with its neighbour, at No. 4, in the same block, had no connexion, we are told, with the Office in the Strand.

se or tower of the "stately brick mansion" t by William de Wainflete, Bishop of nchester 1447-86. William I. bestowed manor upon St. Leutfrid's Abbey; the ot sold it to Peter de Rupibus, *temp.* ry III.; Edward I. gave it to the See. lsey, having succeeded Fox as Bishop of nchester in 1528, meant to rebuild the se. But on October 18, 1529, he was com-ded to surrender the great seal, and to e to Esher. There he abode three or weeks, in sorry state, attended by Dr. ts, and ceded York-place (Whitehall). en Mary restored the lordship and manor, the park, about 185 acres in all, as part Hampton Court Honour, to Bishop diner. Her sister bought it back again he See in 1583. In the eighteenth-ury a division of the property was made. Latton sold to Thomas Holles Pelham, e of Newcastle, all of the manor (includ-Watevile and Claremont) excepting r Park and the house, which latter sold to Peter de la Porte. Bought Dennis Bond in 1724, Esher-place was by him, in 1729, to Henry, the Duke's ner, whose residence here Thomson cele-es.* By this time little more than the gate-ways of the bishop's house remained. ry Pelham employed Kent to make addi-thereto, and Kent retained the present way for a central feature of his design. r Palace ultimately passed to John er, for whom Edward Lapidge built the ing house, of brick, stuccoed, and with ionic order on each face, upon higher nd away from the river. Spicer pulled n all Kent's work, but kept one of the rs, and planted ivy against its walls. The r, being of red brick with stone dress-and having large octagonal turrets, is stories high; the third and fourth stories machicolated. It may be compared with e of Layer Marney, *circa* 1506 (see the *der* of April 3 and 10, 1886), and Lees, Felstead, founded *circa* 1229. E. W. ley gives two views in his "Surrey" 1), and mentions the newel staircase of , in the roofing of which, he says, "the ciples of the construction of the oblique (a supposed invention of modern times) practically exhibited." Other views are Kuyff and Kip, *circa* 1695; J. Rocque, ying Kent's additions, 1737; and Luke van's large print of the west front, 1759. olsey's Well," a resting-seat on the high , bears a stone inscribed with "H. P." the cognisance of the Pelhams,—a heart-ed buckle, an augmentation of honour to nemorate Sir John Pelham's capture, on iers field, of John, King of France.

'E referred last week to Mr. Jacoby's bill for putting further restrictions on London organ-grinders, and to the foolish r in the *Times*, in opposition to it, ex-ing at the same time our fear that the imentalists would carry the day. The afternoon there appeared in the *Pall Gazette* the following communication Mr. Jacoby:—

desire, through the medium of your widely-paper, to say that, on account of the strong ng in the House against the Itinerant Street cians Bill, it is hopeless for me to proceed with measure. The musical (?) mendicant has won lay, thanks to hyper-sensitive fanatics, who in ame of 'liberty of the subject' have no con-nation for the sufferings of peace-loving citizens. courage of the anonymous correspondent to *Times*, 'R. B. B.,' is beneath contempt. If he Radical, why this secrecy, and why does he t the favourite organ of coercion to pour out roes?"

is the third effort we remember to bring e legislation to bear on this intolerable don nuisance, and on each occasion the ll intention has been frustrated by the nour of silly people on the ground of anthropy. The following remarks from our contemporary the *Lancet* serve to show that the medical mind is on the same side with the artistic mind on the subject:—

"The nuisance caused by street 'musicians' is a very ancient grievance, and it is greatly to be hoped that Mr. Jacoby will be more successful in his proposed measure for its removal than others have been before him. . . . A large proportion of the inhabitants of these Kingdoms must dwell in large towns or cities, and to all those who do not possess the power of abstraction, the wear and tear of nerves, the worry and trial of temper caused by noises, tell very seriously on the health, and, it may be added, even on the duration of life. Street noises may be divided into those which are inevitable, and those which can be prevented. To the former belong those caused by street traffic, to which people get so used that the quiet of the country is often irksome; while modern forms of pavements have in recent years done something to diminish them. The principal noises which can and ought to be prevented, are those caused by street cries and street 'music.' . . . It is unfortunate that the subject of street 'music' has never been treated either in or out of the House of Commons with the seriousness which it merits. Those who complain of it are ridiculed, or a plea is urged on behalf of the poor who but for these itinerant 'musicians' would never hear that 'music' which 'hath charms to soothe the savage breast.' It may be very safely asserted that the music alluded to by the poet was very different from the discordant sounds which issue from German bands and Italian barrel-organs. Moreover, Londoners have this so-called street music inflicted upon them at any hour of the day, however unseasonable, from early morn to dewy eve, and even up to nearly midnight. The late Mr. Babbage, the late John Leech, and others, who have earned fame in literature, had their lives harried, if not shortened, by this pest, and the marvel is that it has been tolerated so long."

THE Exhibition at the French Gallery in Pall Mall is a better one than last year, and contains several remarkable works, among which Professor Holmberg's "The Virtuoso at Home" (44) is pre-eminent. This is a large picture representing an old gentleman seated, facing the spectator, behind a table covered with curios, and examining an old print which he holds in his hand. The various articles on the table are painted with most brilliant realism, as well as the architectural details of the room; but the best point about Holmberg's works of this class is that however brilliantly the accessories are painted, the figure is always the most interesting and powerful thing in the picture. The head of the man in this case, a very characteristic though not a very attractive type, is painted with remarkable power. Across the room is a smaller work by the same painter, "The Sacristy; Leisure Hours" (75), an interior lighted by the subdued radiance of a Renaissance stained-glass window, against which is relieved a gowned figure reading to an old ecclesiastic in scarlet robes, an acolyte (whose face is the best thing in the picture) standing behind. Professor Knaus has given us a picture of far greater interest than the little dirty boys he used to be so fond of; an interior apparently of a working-man's club, with a single figure of a man scowling in the indulgence of injurious thoughts against things in general, the *Neue Freie Press* and other journals filed on the wall above him. The expression of the "malcontent" is admirably given. Near this a large painting by M. Gustave Courtois, "Recueillance" (15) represents a woman and her little son, a boy of ten or so, seated quietly in a Venetian church, the wall draperies of which form a background to their figures; a boldly designed wrought-iron candelabrum fills up one side of the picture effectively. The boy's face is exceedingly beautiful; it strikes us, however, that both his head and his hands are rather too large for the general proportion of the figure. There is a splendid painting by Rosa Bonheur of a "Bouc et Chèvre" (43), the heads and necks only of the two animals, treated with that monumental grandeur of character in which she stands alone among animal painters. Herr Schwartze's painting "The Orphelinat Bourgeois, Amstersdam" (64), is a life-size group of girls in red and black dresses with white tippets, singing the Psalms; there is a fine decorative effect about the work, but it is too large in scale for the subject, unless it is intended as a kind of presentation or Board-room picture for some such institution as it represents. Professor Heffner's pictures "On the Norfolk Broads" are merely the old Heffner receipt with a new name. Herr Heffner goes from one country to another, but his effects are the same everywhere—

"Cœlum non animum mutat, qui trans mare currit"—

and he wishes to persuade us that the atmospheric tone and character of the landscape are the same in Norfolk as in Bavaria. The large work by Israels, "The Sick Wife" (36) has not his usual sentiment, and is not very interesting, nor do we care for such painting of squalor and dirt as in his "Old and Worn-out" (52); the small painting, "The Seamstress" (25), is in his best manner. Among other good works are Clay's "Stormy Weather" (14), Kate Bisschopp's "The Beginning is Difficult" (29), and one of Meissonnier's tiniest of pictures, "The Connoisseurs," which in fact it was impossible to see, as it was placed on one of the sofas, and a row of ladies persistently sat in front of it.

WE have received the first number of *The Trade Unionist*, a weekly paper. The lines on which it is to be carried on are pretty well indicated in the following sentence on the first page:—

"We are eight-hour men out and out, that is, until we see a chance of getting a seven or six hour day. We are strongly opposed to systematic overtime, and are favourable to a monthly day's holiday for every worker, and are opposed to more than five-and-a-half days' work in any one week."

Perhaps *The Trade Unionist* will follow this up by a little calculation as to the possible effects on the price of food, and on the withdrawal of work from English hands to put it into foreign hands, which this programme would be likely to lead to. And as a matter of logic why stop at a beggarly reduction of two or three hours a day in the time of working? Why not go in for doing no work at all? That would be still simpler, and only carrying the same policy a little further.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE eleventh ordinary meeting of this Institute for the present session was held on Monday evening last, at 9, Conduit-street, Mr. Alfred Waterhouse, R.A. (President) in the chair.

Architecture: an Art or a Profession?

Professor Kerr said that he had a remark to make upon the minutes, and he would do so without raising any discussion upon what was issued in the "Transactions" from time to time. They had all observed a very interesting correspondence between a committee of architects and others on the one hand, and the Council on the other. Those gentlemen had assailed the Institute upon a very important question,—viz., whether the Institute was an artistic guild or not. The Council very properly proposed a conference, but the gentlemen in question, who were men of high standing, practically declined to appoint their delegates, and the Council thereupon met them half way by saying that nothing further could be done. To outsiders this looked like the well-known case when—

"The Earl of Chatham, with his sword drawn,
Was waiting for Sir Richard Strachan;
Sir Richard, longing to be at 'em,
Was waiting for the Earl of Chatham."

It was extremely important that they should know what the Council proposed to do in the matter. In a month's time the annual general meeting would take place, which would be an excellent opportunity for discussing the whole question, or the matter could be discussed at one of the three intervening Monday meetings. If not, he would venture to draw attention to the question at the annual meeting, and would then propose "That while the Institute recognises the value of the Examinations, it does not, as it is supposed, sacrifice its character as an artistic and scientific society."

The President said that the Council would

* "Slow let us trace the matchless vale of Thames:
. . . . . to royal Hampton's pile,
To Clermont's terrac'd height, and Esher's groves,
Where in the sweetest solitude, embrac'd
By silent windings of the silent Mole,
From court and senates Pelham finds repose."
'The Seasons.—Summer.'

consider what was best to be done to meet Professor Kerr's suggestions.

Origin and Mutation in Indian and Eastern Architecture.

Mr. William Simpson, R.I., M.R.A.S. (Hon. Associate), then read a paper entitled, "Origin and Mutation in Indian and Eastern Architecture." The following is an abstract of the paper:—

In his introductory remarks, the author claimed one merit for his paper,—that it brought forward new material, some of which came from the rather out-of-the-way regions of Afghanistan and Central Asia. Dealing first with the Chinese pagoda, according to the learned Chinese its design had been brought from India with Buddhism, and was a copy of Indian structures. There were no remains of such monuments in India, and he surmised the origin was the Buddhist stupa or tope; but how the umbrellas which surmounted the stupa had grown into a series of rooms, each with a roof, was a mutation difficult to account for. In 1861, however, he had made a sketch of some old sculptured stones erected like pillars at Dras, near Kashmir, on one of which was a representation of a stupa containing the Tee and thirteen umbrellas, forming a high spire standing above the stupa. This gave a solution of the Chinese pagoda; those about Pekin and Northern China having only one room at the base, with the roofs resting on each other exactly like the umbrellas of the sculptured stupa. Professor Beal, also, had mentioned forty-two pagodas at Lo-Yang, as being "formed after Indian models;" and there could be little doubt but that Buddhist monks introduced the stupa or pagoda into China from India *vid* Afghanistan. The umbrella had become a royal symbol over a large portion of the East, as was seen in Assyrian sculptures, in India, and in China; being a royal emblem it became a sacred one; was placed over figures of Buddha and stupas; and when stupas had been converted into pagodas, the umbrellas had been changed into regularly constructed roofs. The sikhara, or spire of the Hindu temple, was next considered. The temple was a square cell, with a small door on one side and the spire a continuation of the four sides, tapering with a curve but not to a point, with a large circular object resting on the summit, upon which was generally a vase or water jar. This temple most probably originated in a wooden form, but the transition to stone must have occurred a long time previous to the Bhuvanes'vara temples, a theory which had often been proposed. But he could not believe in the transition of the stupa to the sikhara; on the other hand, he suggested that this form of temple was first constructed with bambus. The cell could easily have been formed of bambu posts; the sides covered with reed mats; and the four bambus at the corners, rising higher than the cell, would be covered in some simple manner and bound together, with the upper ends bending inwards, thus reducing the width of the spire at the top. If this were the correct solution it explained the chief problem; and, while with changed material new forms in the details would appear, the original outline would still exist. In Bengal was a peculiar type of temple, the sikhara of which was admittedly of bambu and thatch origin, although differing in detail from that of the northern temple. This bambu sikhara was little more than a roof; but a square platform was left on the top upon which a small model of the temple below, also with a bambu sikhara, was placed. A photograph of a festival car, in a partly dismantled condition, showed the bambu framework which gave the outline of the sikhara, and these cars, which were simply temples on wheels, might have been the origin of the Hindu temple. But a new and entirely different stratum of material, on further consideration, appeared to offer a much more probable origin. The sikhara belonged more particularly to the northern style of architecture, and to temples devoted to Siva. Having referred to the burial of Hindu ascetics in a sitting position, quoting from Dr. Rajendralala Mitra's work, a paper by Mr. Rivett-Carnac, and an account of the Jangams by the late C. P. Brown; and having given strong evidence that the worship of Siva had been originally connected with funeral rites, he said he considered that the aboriginal inhabitants had made their graves round, which he took to be the stupas, while the Aryans made them square. And these graves or tombs he considered the origin of the Saiva temple.

One of the primitive tribes in the Nilagiris of the Madras Presidency was known as the Todas, and their religion and temples formed an interesting study. The roof of a temple to which the Todas gave the name of "Boath" was a tall cone, the apex of which was crowned with a large stone under which the sacred relics were kept. This established the accuracy of the suggestions by Fergusson and Dr. Burgess that the Tee on the top of the stupa was a relic-shrine or relic-chamber; while the repetition of the temple below in the sikhara of the Bengal temple was also most probably a relic-holder. He was also inclined to believe the amalaka, or the vase, on the summit of the Saiva temple sikhara, was originally employed to contain relics.

Dealing next with the barrel-roofs of chaitya caves,—chaitya being another name for stupa or tope,—and having described their formation, the author said he had tried to find the reason why the same people who now produced the simple flat roof constructed such an elaborate work, and thought he had at last discovered the origin, as well as the manner in which it originated, in the Toda house. This was constructed of bambus, which formed the two sides and the roof. The bambus were placed in a row, the upper ends of both sides being bent inwards till they met in the centre, where they were bound with split rattan and the whole thatched with grass. The result was what might be called a barrel-roof, the outline being a compromise between a pointed arch and the oval Sassanian arch. It was probable that the roofs of the Behar caves, small and simple compared with the magnificent chaitya halls of Western India, were also developments of the Toda house, and not copies of a constructive arch. Mr. Simpson then proceeded to trace these forms through Afghanistan to Central Asia and Khorassan, where constructive arches, domes, and barrel-roofs were to be found, and so to arrive within measurable distance of the region covered by Mr. Phené Spiers's Paper on Sassanian Architecture.* The number of old Buddhist caves in Afghanistan was very large, and their exploration was due to the late Afghan Boundary Commission. They seemed to have been all open in front and rectangular in plan. As a rule the roof was circular, but at times the upper part was flattened. A marked feature was a drip at the spring of the arch. At Hada, near Jellalabad, were one or two small square caves with domes. At Dowlutabad, on the eastern bank of the river Heri Rud, which formed the eastern boundary of Persia with Afghanistan, he had found what he believed to have been Buddhist caves, and, if his belief was correct, the latest monumental evidence of the extension of Buddhism westward in that part of the world.

While the Commission wintered at Bala Murghab, a number of caves were discovered, and in two cases plans and sections were made. Major F. de Laessoë, while stationed at Penjdeh, discovered an interesting group of caves, forming quite an underground town. The sides of all of them were perpendicular, with a drip at the spring of the arch, the arch itself being "pointed." The author was indebted to Major Talbot, R.E., for plans and sections of a series of caves, at Haibak and Balkh, which would prove of great value as bearing on the history of the dome. The dome over a square cave, an illustration of which was exhibited, introduced an entirely new form, being evidently excavated in imitation of a structural dome; and, with the exception of a few belonging to Jain temples, no constructed domes existed in India until the Mohammedan period. That it was a copy of a built form was manifest from the pendentives. The dome was not pointed, but round at the top, in the same form as the Sassanian. It was all but certain that this Central Asian form of dome belonged to a style of architecture closely allied to the Sassanian, the only difference being in the number of concentric arches; three was the rule in the Haibak caves, while in the palace of Serbistan there were at least six or seven. An important point was whether the Haibak caves were exceptional or not, and the author considered they were not, but that if the multitude of caves in the locality were visited and drawn, the same structural type would be found in them all. Another point to be noticed was the absence of the slightest touch of Greek influence in them, although Greek artists and architects must have gone to Balkh, otherwise the Greek influence visible in the sculptures and in the stupas, of which remains still existed in Afghanistan and the Panjab, could not be explained.

In conclusion, Mr. Simpson said that all round, curved, or domical forms in Indian architecture had their source in structures of wood—more particularly bambu; and that in tracing the form of the caves from near Buddhai Gaya to Afghanistan and Central Asia, it must be owned that their simplicity of form gave but a slender means of comparison. Still, it should be remembered that all the main features of the Behar caves were found more or less in a rude condition in the Afghanistan caves, and as he knew of no others nearer to Afghanistan than those in Behar, the conclusion seemed reasonable that the forms were carried from that place. From sculptures it was known that domes were constructed in Mesopotamia at a far distant date; in Central Asia there was no evidence of this kind; but his paper would help to favour the supposition that any mode of building in one of these countries was probably practised in the other; and considering that the civilisation of Central Asia was very old, and had been very celebrated, he thought the claims of Central Asia to have produced the dome were as good as those of any other part of the world.

* See *Builder*, December 6, 1890, p. 438.

In the discussion which followed,—Mr. R. Phené Spiers said that the subject of the origin and mutation of architectural form had occupied his attention for some little time, and one of the first suggestions he had received with regard to the origin of Indian buildings was from Mr. Simpson. The caves which were illustrated on the screen were remarkable, and seemed to be either the copies of Sassanian temples or of somewhat similar buildings of the same country and time. That portion of the paper was an addition to their knowledge, and proved that these had been copied from the arched construction of burnt bricks in the same way as some of the other examples shown had been copied from bamboos and other forms. He hoped the paper would lead some of their students to take up the question of the origin and mutation of features in Indian architecture. He moved a vote of thanks to Mr. Simpson.

Mr. W. Kidner remarked, that during his residence in China he had been struck with the fact that the tent he saw used by the Mandarins supplied the original type of the Chinese roof.

Mr. John Slater, B.A., seconded the vote of thanks to Mr. Simpson, and said that anyone who desired to write the history of the evolution of architecture must take account of Indian buildings. He was rather surprised at Mr. Simpson stating that he had given up the idea of the car as the prototype of the temple. It was a matter of common knowledge that the origin of all religions had been the totem of the family, and as no doubt the early Indian tribes carried this totem about with them, it would be put into a car, which, when they settled down, would be taken as the type of the temple, very much in the same way as the tabernacle formed the prototype of the Hebrew temple.

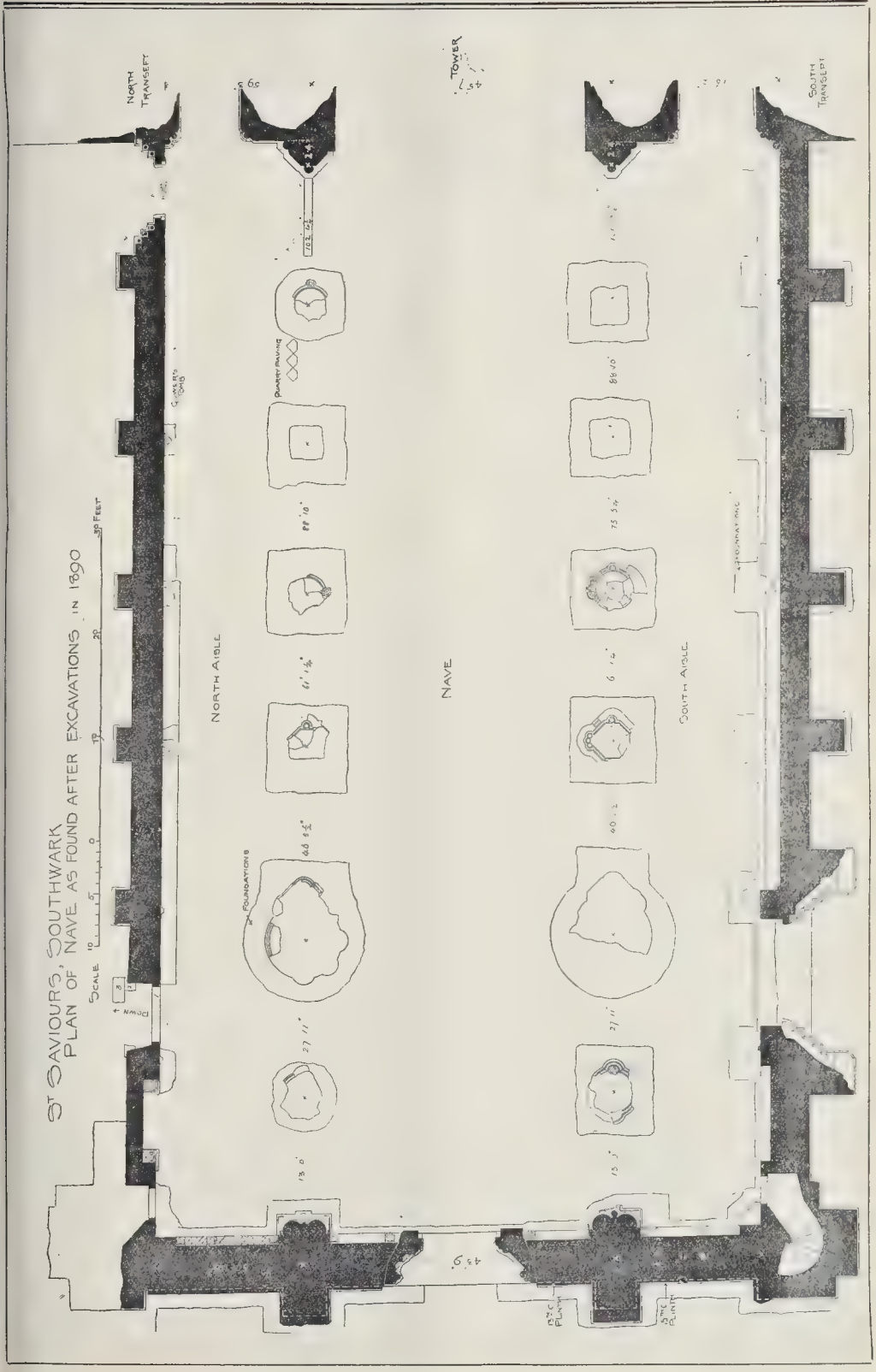
After a few remarks from Mr. Campbell Douglas, the resolution was put and carried by acclamation, and Mr. Simpson briefly replied.

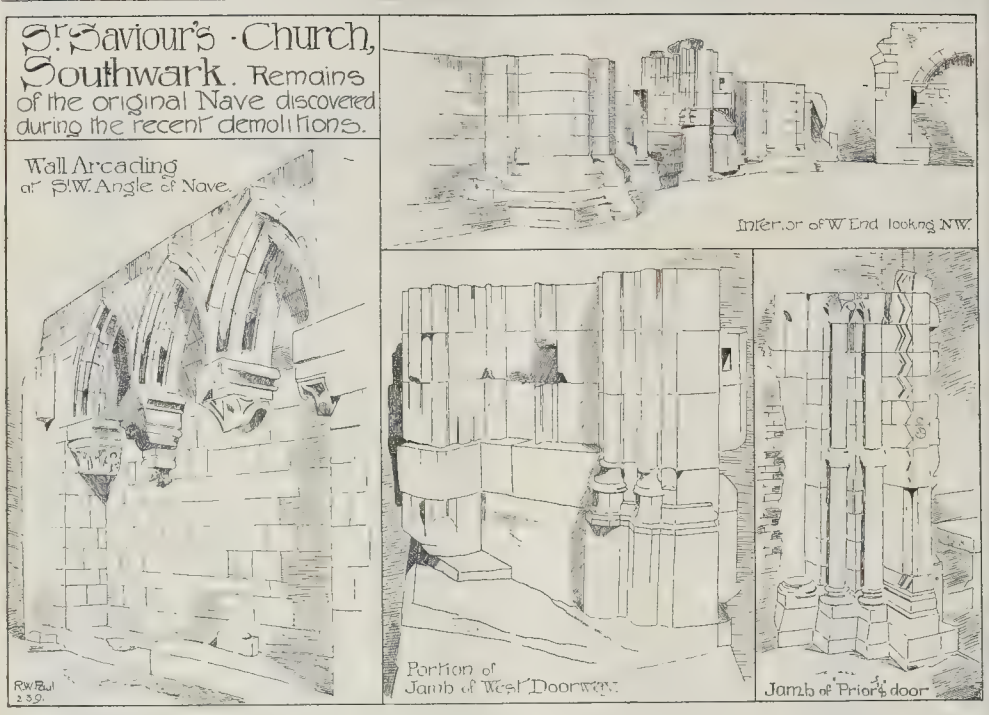
The President announced that the next meeting would take place on Monday, the 20th inst., when papers on "Decorative Painting" would be read by Messrs. W. B. Richmond, A.R.A., Ford Madox Brown, J. D. Sedding, and N. H. J. Westlake. The meeting would be held under the arrangement of the Art Standing Committee.

The proceedings then terminated.

ST. SAVIOUR'S, SOUTHWARK.

We publish to-day, by the kind permission of Sir Arthur Blomfield, a ground-plan of the thirteenth-century nave of S. Saviour's Church, Southwark, which exploration on the site, after the destruction of the modern brick nave, has revealed. The plan shows the position of the columns of the nave arcade, and the outer walls generally, some of which are standing several feet above ground. The north wall of the church is Norman, and its buttresses still remain. At the east end, next the north transept, are the jambs of a Norman doorway which led to the cloisters situated on this side. A door at the other end, but of plain design, is still partially standing, with a monumental arched recess immediately eastward, some-


ST SAVIOUR'S, SOUTHWARK
PLAN OF NAVE AS FOUND AFTER EXCAVATIONS IN 1890
SCALE
30 FEET
NORTH TRANSEPT
SOUTH TRANSEPT
TOWER
NORTH AISLE
NAVE
SOUTH AISLE
FOUNDATIONS
PIER FACING
ARCH FACING
GRAVES
DOWN



what similar in shape to those in the north aisle of the choir. Near the eastern end of this wall was found the grave of Gower, whose monument is now against the east wall of the south transept. It is intended, we believe, to restore this monument to its old position.

The wall arcading still remains in a fragmentary state on the west, and a portion of the south walls. That at the south-west angle is the most perfect. A fifteenth-century western doorway was inserted, and the fragments of the panelled jambs have been found. The later plinth overhung the earlier one, as will be seen by reference to the plan, and also to the sketch, which, with the others of the Norman doorway, the wall arcading, and the west end, were made a few weeks ago before the demolition of the remains, which was found necessary in order to make way for the new work. The proposed new nave we have already illustrated (*Builder*, May 10, 1890), and although the discoveries on the site have no doubt modified some of the details, we understand that the general design will remain unaltered. We are also glad to hear that the arcading and monumental arch which we illustrate will be preserved and incorporated with the new work.

ADDITIONS TO ALTAR, ST. BARNABAS CHURCH, GUERNSEY.—The church of St. Barnabas, Guernsey, was built as a mission church, and dedicated in the summer of 1874. It seats about 500 worshippers, and was erected from the designs of Sir Arthur W. Blomfield, A.R.A. At that time funds were a serious object, and the altar-table, made of British oak, was of the barest possible design. Since then its front has been filled with sculptured figures. The subjects chosen are the figures of seated saints, carved in relief, and in recessed panels. They represent St. Peter, St. Paul, St. Barnabas, and St. Mark respectively. The altar was sent to the studio of Mr. Harry Hems, at Exeter, who has carried out the work.

GEOLOGICAL MAP OF ENGLAND.—Messrs. G. W. Bacon & Co. send us their pocket geological map of England and Wales, which is not a very harmonious map to look at, but the strong and rather crude colours used serve to make the confines of the various outcrops of strata plain to the eye, at all events, and the map is convenient in size for carrying in the pocket when travelling. Four sections through various parts of the country are given in the margin, coloured similarly to the map. A vertical scale should however have been given for the sections, which may otherwise be taken by the unlearned as representing the actual contour of the land.

THE LONDON COUNTY COUNCIL.

THE London County Council reassembled on Tuesday afternoon last, after the Easter holidays, Sir John Lubbock, Chairman, presiding.

Finance.—This being "budget" day, the estimates for the year were brought up by the Finance Committee, whose Chairman, Lord Lingen, made a long speech in explanation of them. The upshot of all the details is that the amount required to be raised for the year ending March 31, 1892, is 1,581,398*l.*, equal to a rate of 11 75*d.* in the pound outside the City (9·50*d.* in the City), as compared with 13 25*d.* raised in 1890-91. The reduction of 1½*d.* in the pound in the total rate is due mainly to an increase in the estimated receipt from the Exchequer Contribution brought into account, and to the increase in the productiveness of the rate, owing to the quinquennial valuation which comes into force on April 6, 1891.

Wages of Builders' Labourers.—An adjourned report of the Special Committee on Contracts, dated February 24, was as follows:—

"We have had before us a letter from Mr. A. Humphrey, The General Secretary of the Navvies', Bricklayers' Labourers', and General Labourers' Union, dated December 3, 1890, alleging that in November last Messrs. Mowlem were employing labourers on works for the Council at Victoria-street, Wapping (Cable-street Artizans' scheme), at the rate of pay of 5½*d.* per hour. Upon receiving this letter we asked Messrs. Mowlem whether they had any observations to offer upon the statement contained in it. In reply, they forwarded, under date December 18, a copy of a letter which they had addressed to Mr. Humphrey in reply to a letter from him on the subject, and stated that they had 'no other observation to make upon the matter.' In this letter to Mr. Humphrey, dated November 28, 1890, Messrs. Mowlem & Co. state:—'We are paying the men on our works at Cable-street what we consider to be fair rates of wages according to the work they are doing. They are perfectly free agents, and, if any of them are not satisfied, it is quite open to them to leave the work and go elsewhere if they think they can better themselves by so doing.' We have ascertained from the Council's Assistant Engineer that the contract for the works was for a lump sum, but that a schedule attached to the contract showed that 6½*d.* an hour was the rate which would have to be paid by the Council for labourers' time in the event of any extra works being required to be done, which rate, however, included the use of tools. The Assistant Engineer has also stated that he has been informed by Messrs. Mowlem that at present there are no labourers employed by them on works for the Council who receive less than 6*d.* an hour. We therefore directed that Messrs. Mowlem should be written to, asking whether, in the week previous to the 22nd of November (being the day on which Mr. Humphrey made his inquiries) they were paying some of the labourers employed upon the Council's works under the Cable-street scheme at the rate of 5½*d.* an hour; whether that was considered a fair rate of wages for labourers; and whether there were, at the date of the letter, any labourers employed by them upon the Council's work who were receiving less than 6*d.* an hour. To this Messrs. Mowlem, under date February 11, 1891, replied as follows—'We submit that the questions asked are such that we cannot reasonably be expected to answer. The letter we wrote you on December 18 explains the position we then thought right we should take up, and we do not see that we can take any other view now.' We have had Mr. Humphrey before us, and he has informed us that to his own knowledge thirty men were at the time of his visit to the works on November 22, receiving 5½*d.* an hour, and that many of these were discharged on that day. He further, at our request, gave the names and addresses of four of these men, and stated that he could give the names of many more, but, for certain reasons which will be readily understood, withheld them. Mr. Humphrey further informed us that 6*d.* an hour was generally looked upon as a fair rate of pay for able-bodied unskilled labourers. Messrs. Mowlem & Co. were informed by letter that this complaint would be heard at the time and place specified, and were invited to attend. No one appeared on their behalf. We consider that the facts above set forth show that Messrs. Mowlem & Co. have not kept to the terms of their undertaking 'to pay such rates of wages as are generally considered fair in the trade'; and we recommend—

'That Messrs. Mowlem & Co be informed—That in the opinion of the Council they have, in paying the labourers employed on the works of the Council under the Cable-street scheme at a less rate than 6*d.* an hour, departed from the terms of the declaration made in their tender, that they 'pay such rates of wages and observe such hours of labour as are generally considered fair in the respective trades.'"

The recommendation was agreed to, after considerable discussion.

The Main Drainage Question.—The Main Drainage Committee presented the following report:—

"We have received the joint report of Sir Benjamin Baker and the Chief Engineer, prepared in pursuance of the instruction of the Council of December 17, 1889, upon the main drainage system of London. The report has been circulated amongst the members of the Council, and is receiving our

careful consideration. We are not, of course, in a position at present to deal with all the important recommendations contained in the report, but as regards that portion of it which gives an approximate estimated cost of the proposed works for improving the existing system of main drainage on the north and south sides of the river, we are of opinion that these are of so urgent a character that no delay should take place in acting upon them. We therefore recommend,—

'That detailed plans be prepared of the new sewers on both sides of the river as proposed by Sir Benjamin Baker and the Chief Engineer of the Council in paragraph 10 of their joint report upon the main drainage of London.'"

On the motion for the reception of the report, Sir Walter de Souza asked a question of the Chairman of the Committee suggesting whether, instead of constructing one of the proposed new sewers, it would not be cheaper to enlarge the Oxford-street sewer; and whether the latter course might have been ignored as likely to interfere with the proposed Central London Railway.

Mr. Howell Williams, the Chairman of the Committee, said that he was informed by the Engineer to the Council that the enlargement of the Oxford-street sewer, even if the level and gradient of it were suitable,—and they were not,—would be much more costly than making a new sewer. He thought the latter part of the question was an uncalled-for reflection upon the good faith of Sir Benjamin Baker. In conclusion, Mr. Williams moved the adoption of the recommendation.

Mr. Bassett Hopkins moved an amendment referring the matter back to the Committee with instructions to obtain alternative estimates for the work on the basis of separating the rainfall from the sewage, but before the discussion had proceeded very far the consideration of the subject was adjourned.

Proposed Paving of the Victoria Embankment with Wood.—The Highways Committee presented a report of which one paragraph was as follows:—

"We have, in connexion with the question of the future maintenance of the embankment carriageway, considered whether, having regard to the large cost, amounting last year to about 3,100*l.*, of remetalling, it would not be advisable to adopt some less expensive surface for the road. We have received from the Engineer a report stating that the annual cost of maintenance of the existing carriageway is 2s. 1d. per square yard, while the annual cost of wood-paving for the same area would probably amount to only about 1s. 11½d. per square yard, including the provision of a sinking fund to repay the cost of the wood in eight years, and of the concrete foundation in 30 years. He further states that when the cost of the foundation shall have been repaid, the cost of maintenance per square yard per year will be reduced by 2½d., and that in his opinion the adoption of wood paving would result in a present saving of £500 per annum in this item. The superficial area of the carriageway of the embankment amounts to 54,500 square yards, equal to a length of four miles of an ordinary 40-feet road; and the Engineer estimates that the cost of wood pavement for this area would be about 28,250*l.* He further suggests that if the wood paving be adopted, the work of laying it should be carried out in three sections in three successive years, in order to avoid, as far as possible, a prolonged interference with the traffic both in the first laying of the pavement, and in the execution of repairs which may become necessary thereafter. Having fully considered these statements, and estimates which have been laid before us of the cost of macadam as against other kinds of road material, we have come to the conclusion that it is advisable that wood pavement should be laid on the carriageway of the Embankment; and we recommend—

'That, subject to an estimate being submitted by the Finance Committee as required by the statute, the carriage-way of the Victoria embankment be paved with wood at an estimated cost of 28,250*l.*; that the repayment of the cost of the wood be spread over a period of eight years, and of the concrete foundation over thirty years; that the work be carried out in three sections in three successive years; and that it be referred to the Highways Committee to prepare a specification, and to make arrangements for the execution of the works.'"

After a short discussion, in the course of which the proposal to pave the Embankment with wood was strongly objected to, on the ground of danger to horses, the report was referred back to the Committee for further consideration, a great deal of dissatisfaction being expressed at the proposal of the Committee.

After transacting other business the Council adjourned.

Erratum.—In our account of Salisbury Cathedral last week, a misprint escaped detection. In line 13, col. 3, p. 271, for "first work" read *joint* work.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION: ANNUAL DINNER.

The thirteenth annual dinner of this Institution was held in the Great Hall of the Cannon-street Hotel on Monday evening last, Mr. Benjamin Hannen, jun., President, in the chair, supported by a large number of the leading builders of London. In all about 290 persons sat down to dinner.

The usual loyal and patriotic toasts having been duly honoured (Colonel Stanley Bird responding for the "Army, Navy, and Reserve Forces"),

The Chairman, in proposing the toast of the evening, "Prosperity to the Builders' Clerks' Benevolent Institution," said it was a great pleasure to him to be allowed to advocate the claims of so excellent an institution as that over which he had been called upon to preside, and he hoped that the result of his advocacy would be that they would obtain the necessary funds not only for maintaining their present pensioners, but for extending the benefits of the Institution to others. The clerks of the building trade were subject to greater vicissitudes than perhaps those in any other branch of trade, owing to the excessive competition of modern times, due to the overcrowded condition of the trade. Unfortunately that was the cause of the prominent position which the building trades occupied in the official returns of bankruptcy. It should be remembered that whenever a misguided or unfortunate builder met with a downfall, he dragged his staff down with him, and many were the cases of hardship arising out of such circumstances in which the Institution had been enabled to help the victims to tide over their difficulties. Such misfortunes as he had referred to came upon the provident and the improvident alike, and the persons sustaining them always received the sympathy and help of the Institution as far as possible. But how much greater even than in those circumstances was the need for help and sympathy when the breadwinner of the family was taken away, leaving a widow and children with little if any means of subsistence? In such cases the Institution had done great service in stepping in to the relief of the bereaved ones. From personal knowledge of the careful way in which its affairs were managed, he was quite sure that the funds entrusted to it were carefully and judiciously, as well as most economically, administered. The Committee were most vigilant in selecting the most deserving cases for help. During the twenty-six years it had been in existence the total amount distributed by it in pensions, temporary relief, and presentations to orphanages was 5,343*l.*, and of that amount 4,558*l.* had been spent upon pensions and temporary relief, and 787*l.* in orphan presentations. Each of the latter was tenable by the Institution for twenty-one years. Since the establishment of the Institution there had been thirty-two pensioners elected, of whom eighteen were at the present time on the books. Until lately there were three orphans supported on its presentations, but now there were four. The sum expended upon pensions had necessarily increased year by year from 12*l.* 15s. in 1868, to 385*l.* last year. While heartily commending the Institution to the support of the master builders and the building trade generally, he would make an earnest appeal to the builders' clerks themselves to join the Institution in larger numbers. They were the persons most interested in the Institution, after all, for it was formed to help them. They should really be its backbone, but that was far from being the case, for he was sorry to say that only a very small proportion of them were subscribers to its funds. He hoped that this state of things would not continue. If they combined together, they would be able to hold out a helping hand to their more unfortunate brethren in the hour of need, and would be able to have something substantial in it. (The toast was received very heartily.)

Mr. G. H. Trollope next proposed "The Architects and Surveyors," coupled with the name of Mr. E. Franklin King, who briefly replied.

Mr. E. C. Roe, in a humorous speech, proposed "The Builders," coupled with the name of Mr. H. T. Ashby, President of the Builders' Institute, who made an interesting and eloquent speech in reply.

Mr. T. F. Rider proposed "The President," and referred to the fact that the President's father, Mr. Benjamin Hannen, sen., had also filled the office of President of the Institution. The Chairman having replied,

Mr. E. Brooks (Treasurer) proposed "The Past Presidents," coupled with the name of Mr. Joseph Randall, who briefly returned thanks.

Mr. J. H. Colls proposed "The Visitors," coupled with the name of Mr. Stanton W. Preston, Clerk of the Carpenters' Company, who in responding described what was being done by his Company for the advancement of technical education, and defended the City Guilds generally.

Mr. W. R. Freeman proposed "The Committee," coupled with the name of the Secretary, Mr. H. J. Wheatley, who in responding, announced lists of subscriptions and donations amounting to a total of 412*l.* 9s. The President's list alone, it should be mentioned, amounted to 285*l.* 13s. 6d.

Cliff Tramway-Lift, Hastings.—We gave a description of this in our last (p. 277). We are asked to add that the glass roofs are being glazed on Mr. T. W. Helliwell's patent system.

THE SANITARY INSPECTORS' ASSOCIATION.

At the April meeting of the Association of Public Sanitary Inspectors held at Carpenters' Hall, London-wall, on Saturday last, the Chairman of the Council, Mr. Hugh Alexander, announced that articles of incorporation had been adopted by the Council, and that in the future the Society's official title would be "The Sanitary Inspectors' Association."

Mr. Alexander also announced that the change of the official designation of Inspectors from that of "Nuisance Inspector" to "Sanitary Inspector" demanded by the Council had been conceded, and would be used in the new Public Health Act, the status of these officials being also on the point of being better secured by their being placed under the authorities of the Local Government Board.

The paper of the evening was one upon "Burial and Funeral Reform," read by Dr. Danford Thomas (Coroner for Central Middlesex), the president of the association, Dr. B. W. Richardson, being in the chair. The lecturer advocated early burial, the practice of France, most hot countries, and of the Jews being in his opinion far more hygienic than the haphazard methods of our own country. The welfare of the living was the greatest consideration, and it would undoubtedly accord best with that consideration if we obeyed the injunction of the Jewish law, "Let not the sun go down twice upon thy dead." Dr. Thomas advocated "earth to earth" burial in preference to cremation, but only one should occupy one grave, the coffins ought to be readily perishable, and suitable ground only (dry and sandy and not wet or heavy soils) should be used for burial purposes. "Go to the ant, thou sluggard," was an injunction the wisdom of which was wonderfully illustrated by actual observations of the burial practices of a colony of ants. Immediately after the death of any member of such a colony the survivors would be found assembling, forming procession, marching to an appropriate sandhill, and depositing decently and reverently their dead, each singly in a separate grave. Next to quick burial, the most important reform to be aimed at was the abolition of extravagant expenditure upon funerals. A memorial invoking legislative interference for the purpose of securing burial and funeral reforms had been presented and had met with a reception so favourable as to justify the expectation that success in that direction would before long reward the efforts of sanitary reformers if they were unitedly and perseveringly put forth. The following were the main points they should endeavour to secure by legislation: 1. That the interests of the living should be chiefly considered. 2. That burial should be timely, and never, unless for ample reasons, be delayed. 3. That coffins should be readily perishable; and (4) that suitable ground only should be used for interments.

A discussion followed upon a resolution of thanks to Dr. Danford Thomas, moved by Mr. Alexander, and supported by Messrs. Tidman, Fairchild, Dee, Richards, Jordan, Coulson, &c., and the President, who wound up the discussion. All the speakers agreed with the lecturer's condemnation of extravagance in funeral expenditure, and in the necessity of considering, before all things, the health of the survivors, but cremation was thought preferable by some of the speakers. Mr. Richards, who had expected to find Dr. Thomas strongly advocating the compulsory removal of corpses to mortuaries, expressed disappointment at no reference being made to the point in the paper. Mr. Coulson raised a laugh by suggesting the utilisation of corpses in the formation of breakwaters, or the employment of the residuum after cremation as guano, or for other useful and practical purposes. Dr. Richardson, while admitting that "earth-to-earth" burial was perhaps the most natural, gave the preference to cremation, these two being practically the only alternatives possible at the present time, although one famous sanitarian, the late Dr. Parkes, had strongly advocated sea burial. He was not in favour of the immediate burial advocated by Dr. Thomas, but he was heartily in favour of the compulsory removal of corpses, soon after death, to public mortuaries under the control of the Vestries. It was a remarkable fact that he (Dr. Richardson) had never known a case of real contagious disease being contracted from a corpse, neither had he been able to verify any such case even after diligent enquiry from many undertakers.

A cordial vote of thanks was passed, which Dr. Danford Thomas briefly acknowledged.

An important paper by the president will be read at the concluding meeting of the Session, on the subject of "National Main Drainage."

Society of Biblical Archæology.—At the meeting of this society held on Tuesday evening last, Mr. P. Le Page Renouf, President, in the chair, a paper was read by Mr. J. Pollard on "The Baal and Ashtoreth Altar, discovered at Kanawat, in Syria, now in the Fitzwilliam Museum at Cambridge."

Rolled Steel Girders.—We have received from Messrs. Skelton & Co. their list of sections of Rolled Steel Girders, with a table of approximate weights and limits of possible variation in section.

Illustrations.

FURTHER SKETCHES AT PETERBOROUGH.

THE two sheets of small sketches at Peterborough, by Mr. Arnold Mitchell, are given this week as a kind of pendant to his large view of Peterborough Cathedral published in our last number. They include various bits of detail in connexion with the Cathedral, as well as two or three characteristic architectural features in the town.

The set of sketches of which they form a part were issued some time ago by the artist as a small book of sketches near Peterborough, which had, we believe, only a limited circulation, and probably many of our readers will be glad to have them here.

HOLFORD CHURCH.

THE subject of this illustration exists in the the form of a very uninteresting building, almost entirely of modern date,—the only old features at present visible being some fifteenth-century window-heads and the voussoirs of a Decorated or Early English arch, recently discovered imbedded in the chancel wall, and re-built as a door to the vestry by the rector. The churchyard cross, shown in the drawing, is also ancient, but the present base and the cross at top are modern and entirely out of character with the old stem. These it is proposed to replace with others of suitable form founded on local ancient examples.

The new work proposed in connexion with the church consists of tower, north aisle, and porch, which, it was suggested, should be built as a memorial to the Poet Wordsworth, who lived for two years in the vicinity. The existing tower contains nothing whatever of interest, and is a stunted "saddle-backed" erection, rough-cast and slated, built somewhere about the middle of the last century, and the present porch is equally mean and modern. The only old feature of the north wall is one of the window heads before mentioned, and this would be rebuilt in the new aisle wall. Local character has been aimed at in the designs for the tower and new work generally, the former being modelled on the lines of that at Ruishton, in the same county, where the present Rector of Holford was brought up. The design has, however, been very freely treated in order to bring the new tower into scale and harmony with the existing building. The materials proposed to be used are Ham-hill Stone for the dressings, and blue lias and the local red rubble for the walling.

Mr. P. M. Johnston, of London, is the architect for the work.

THE NEW "WERDER-HAUS," BERLIN.

IN this number we give some illustrations of the newly-erected business premises which have been placed on one of the most advantageous sites of Berlin by the "Werder-haus" Company, whose aim it has been to give the capital some dignified accommodation for better-class shops and offices.

In accordance with the wishes of the managers, the extensive corner-site has been divided into five distinct blocks, each of which, though carried out on one and the same principle, forms an entirely independent whole; this separation, which it will be observed is duly recognised in the exterior design, having the purpose of facilitating the sale of the property if required.

The buildings having been intended for business and office purposes, the usual feature in Berlin of having residences in the upper stories has not been adopted, as such an arrangement would have had an undesirable influence over the planning of the far more important and valuable floors below.

Special care has been taken by the architect to have the different flats as open as possible, no subdivision into passages, rooms, &c., having been constructed; any such partitions as might be required by the tenant being of light framework, easily movable, to suit the occasion. As to communication between the different floors, it may be well to mention that, besides the well-lighted main staircases, secondary ones (leading from courtyard to attic) have been placed on the different blocks; that, to facilitate this communication, thirteen lifts are to be found on the site, five for passengers, the rest for goods; and that the possibility of forming internal staircases has been duly considered for the case of any one tenant desiring to take two flats one above the other.

From the constructive point of view there is nothing worth special mention. As regards the foundations, it has been found necessary, on account of the high ground water level, to have a layer of concrete spread over the whole site, and a plentiful use of cement has been made in carrying up the lower parts of the brickwork. Heating and ventilation are of a simple kind; no measures besides those required by the building regulations have been taken to ensure protection from fire. The lifts are worked by water-power, each of the blocks having its own motor for pumping purposes. The façades are built of freestone in combination with iron construction, these façades being built in accordance with the local building regulations as to height and projection of cornices, &c. The whole set of buildings have been erected in the short space of eighteen months (at a cost of 1,639,000 marks), according to the designs and under the superintendence of Regierungs Baumeister Alfred Messel.

COTTAGE HOSPITAL, STANMORE.

THIS hospital, which is built of red brick and tiles, is the gift of the late Miss Wickens to the village of Stanmore; it has been erected at a cost of about 2,000*l.*, and is capable of receiving eight patients. The wards and offices are separated from the administrative portion of the building by a cross ventilated octagon; there is also a dispensary and operating-room, and upstairs is a large and well-lighted convalescent hall. Mr. John F. Curwen, of Kendal, is the architect; and Messrs. Kirby & Sons, of Stanmore, are the builders.

THE USE AND ABUSE OF SKETCHING AND MEASURING.*

FIRST, I would ask you to consider what is the object of sketching and what position it ought to occupy as part of our professional training? This was so clearly laid down by Mr. Street, in one of his lectures at the Royal Academy, that I feel I cannot do better than quote his words. He said:—"As there is no sort of training for an architect equal to that of the study of buildings, so it is absolutely impossible for you to learn your art only from the lessons which we are able to teach you here, or which you learn in the routine of an architect's practice."

Further on he said:—"If you have any feeling of the artist in your composition it will be impossible for you to go on for long drawing the good work of other men or other times without gradually finding yourselves distinguishing clearly between good, inferior, and bad work;" and, as a justification for this view, he said: "We know of no period in our art in which architects were not studying the work of men who had gone before. They studied them wisely, so that they might improve them."

I think we may take it, therefore, that the object of measuring and sketching old work is:—

1. To train the mind and eye to what is refined and artistic.

2. To study the mouldings and details by which such effects are produced.

3. To observe the proper uses and functions of different materials, and the best means of combining them for artistic effect.

4. To examine the jointing, bonding, and constructional methods by which the various parts are fitted together.

5. To practise drawing these buildings in perspective, in order that we may be enabled to think in perspective when called upon to design ourselves.

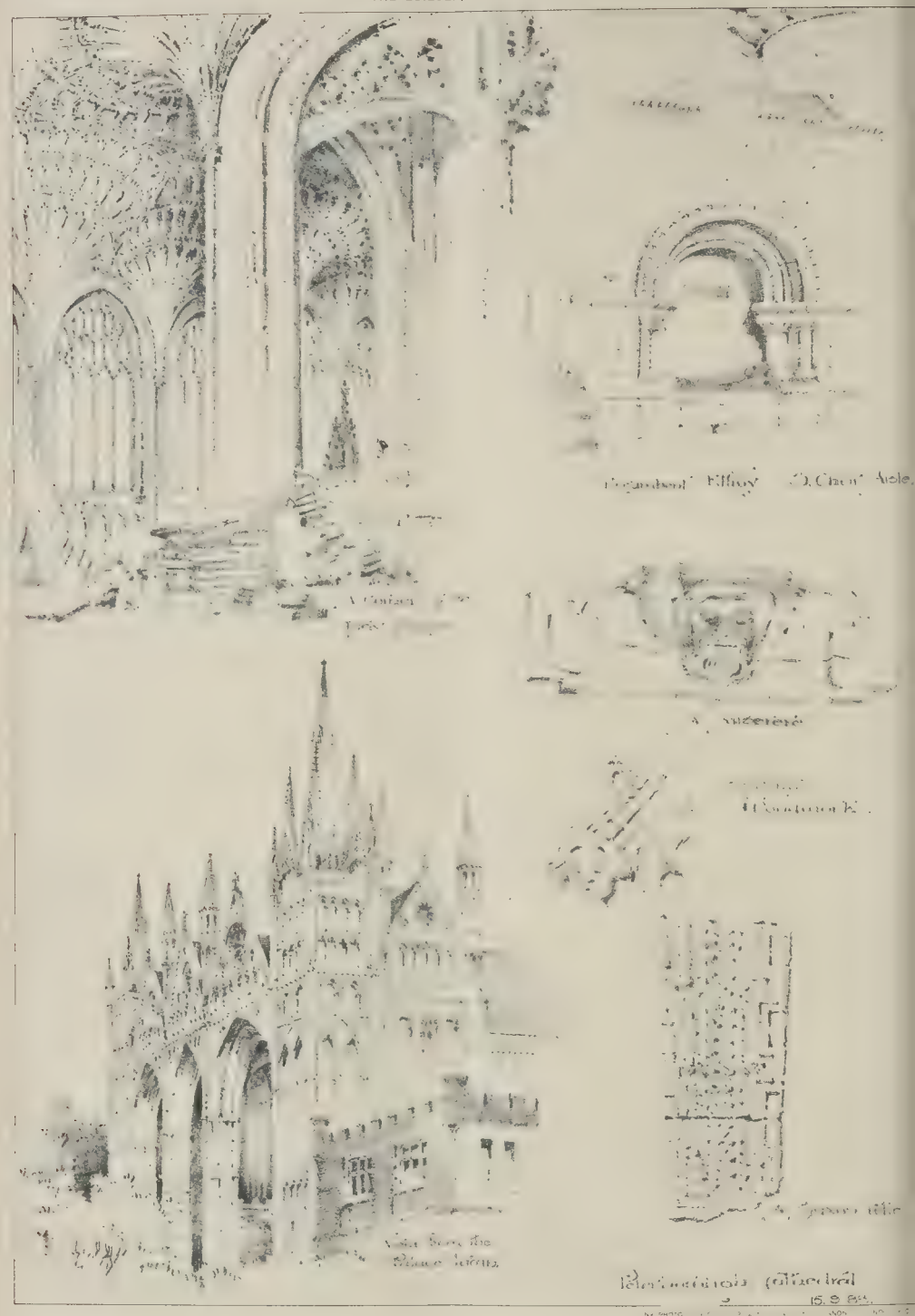
Now, if we bear these objects in mind, they will, I think, afford us much assistance in arriving at a right conclusion as to what we ought to sketch.

But just as the mind is refined by the constant study of good work, so to be continually in the presence of coarse or vulgar things tends to blunt the æsthetic sense, and it is, therefore, most important that the young student should learn as soon as possible to distinguish good from bad work, to study the one and to avoid the other. And this is one of his first difficulties.

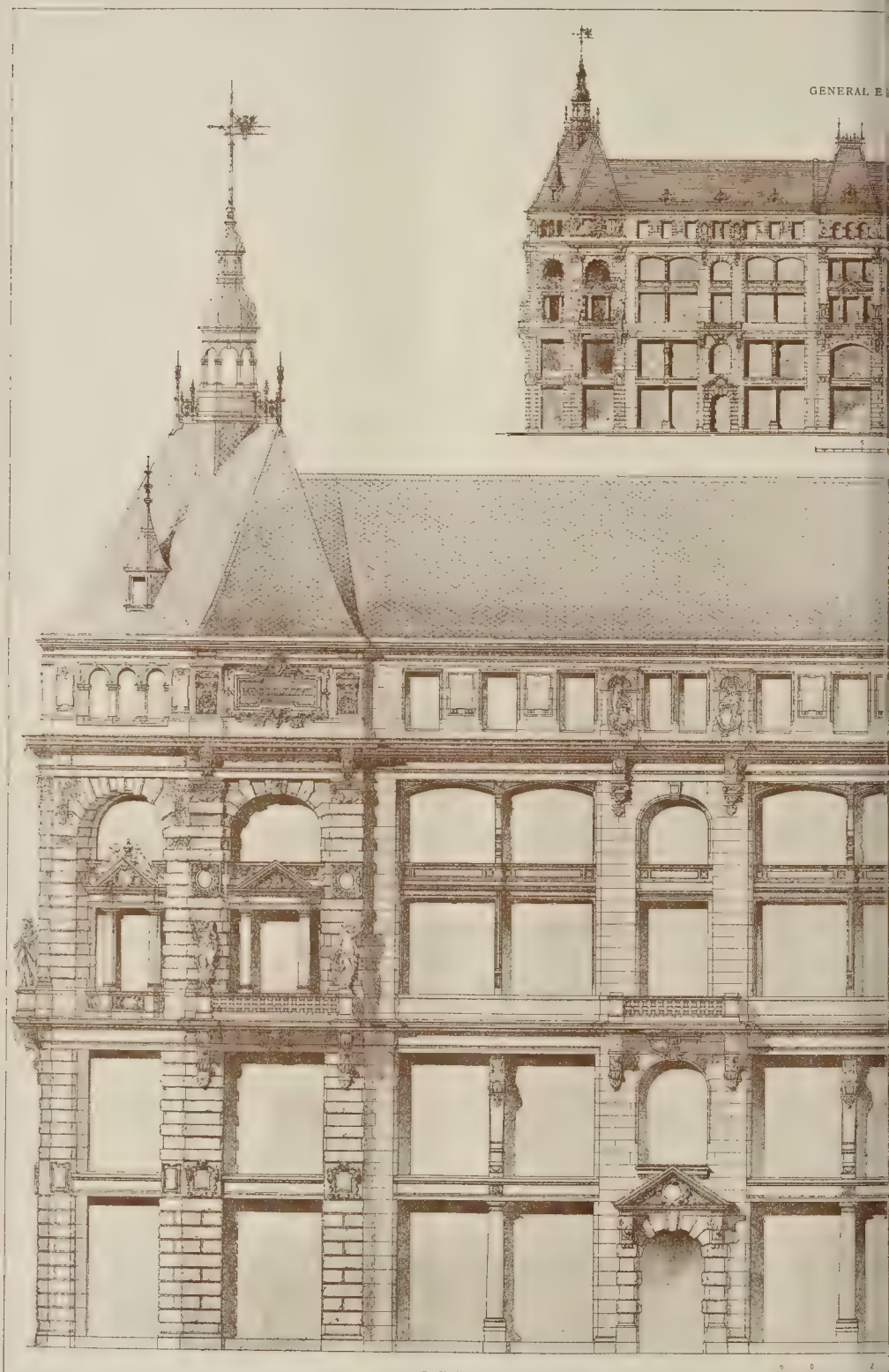
Before he has learnt to separate the wheat from the chaff for himself, he will find the assistance of some more experienced companion of the greatest value, and I should, therefore, always advise a young man when first commencing to sketch to endeavour to go out with others older than himself, who can both assist him in the selection of suitable subjects, and show him how to set about drawing them. Such assistance, if given by a competent adviser,—and there are many such to be found,—is simply invaluable, and, after a little practice, coupled with the knowledge to be obtained from books and other sources, a young student will soon be able to discriminate for himself between what is worthy of being committed to the sketch-book, and what is not. With this object, the London Architectural Association have recently established a class for the study of measuring and sketching, which is carried on by means of visits to buildings in and around London on Saturday afternoons, and at which some of the older members attend as visitors for the purpose of giving their younger brethren the benefit of their advice and co-operation. Although only instituted last session, it has already proved a great success, and there can be no reason why such a class should not be established in Birmingham with similarly happy results. Above all, when first commencing, it is necessary to avoid attempting too ambitious subjects, for there is much more to be learnt from doing something small thoroughly than by attempting something far beyond one's powers, besides which, nothing is more disappointing than failure. It is a very common mistake with the young sketcher to think anything smaller than a whole cathedral beneath his notice, but he will generally find as he gains experience that there is more to be learnt from the careful study of smaller and less important subjects when thoroughly investigated than by making light and airy presentments of huge buildings which are drawn to too small a scale to give any idea of the detail or decorative features. I commend the remarks of Mr. Waterhouse in his opening address at the Royal Institute of British Architects this session to your notice in this connexion. He said: "The student nowadays seems sometimes possessed of the restlessness begotten of the locomotive engine. He stays, it may be, but a day in a place; in that day, to be sure, he does a marvellous amount of sketching, and he continues to visit in the time which he has to devote to his studentship an astonishing number of interesting buildings, the most salient features of which he transfers to paper. I do not see, however, as often as I should like, that the student has sat down before a building to lay siege to it with the determination before he has done with it to make it his own, to enter into the spirit of its builders, and to seek to discover their way of arriving at the ends they had in view." I do not think we ought to infer, however, from these remarks that a student should never study the general grouping and massing of buildings when he has reached that point in his career to enable him to do so with advantage, but I think there can be no question that a general and superficial study of buildings is a useless if not a dangerous style of drawing for a young student to adopt, for it induces a habit of carelessness, and a disinclination hereafter to thoroughly dissect a building and ascertain the means by which the effect which charms him was produced. For a painter it may be sufficient to see and appreciate the beauty of a building as it appears before him, but for an architect, if he wishes to emulate the achievements of those who have gone before him and to learn from their works, he must do more than this,—he must endeavour to find out how it was done, and that can only be accomplished by careful study of their work and the materials they used.

As to how we should sketch; the means which are usually employed at the present time for studying old work are by measuring and drawing to scale, by perspective sketching in pencil only, in pencil combined with light washes of colour, in water-colour, in chalks, and in pen-and-ink, and by taking rubbings. Now, all these various methods have their various uses and are suitable to special classes of work, and I propose to deal with them *seriatim*, pointing out, as far as I am able, the uses and limitations of each. Measuring and drawing to scale must be regarded as the best and most valuable of all, for by no other method can we obtain so complete a mastery and knowledge of the means employed to produce certain effects, or of the various constructive devices by which such effects were carried into execution, and I think it is not too much to say that until a student has in this way pulled a building to pieces, as it

* A paper read a short time since before the Birmingham Architectural Association, by Mr. H. O. Cresswell.

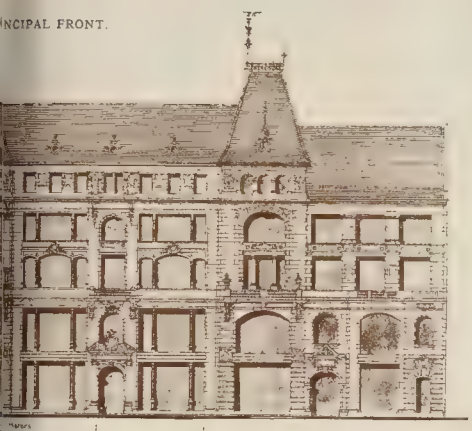


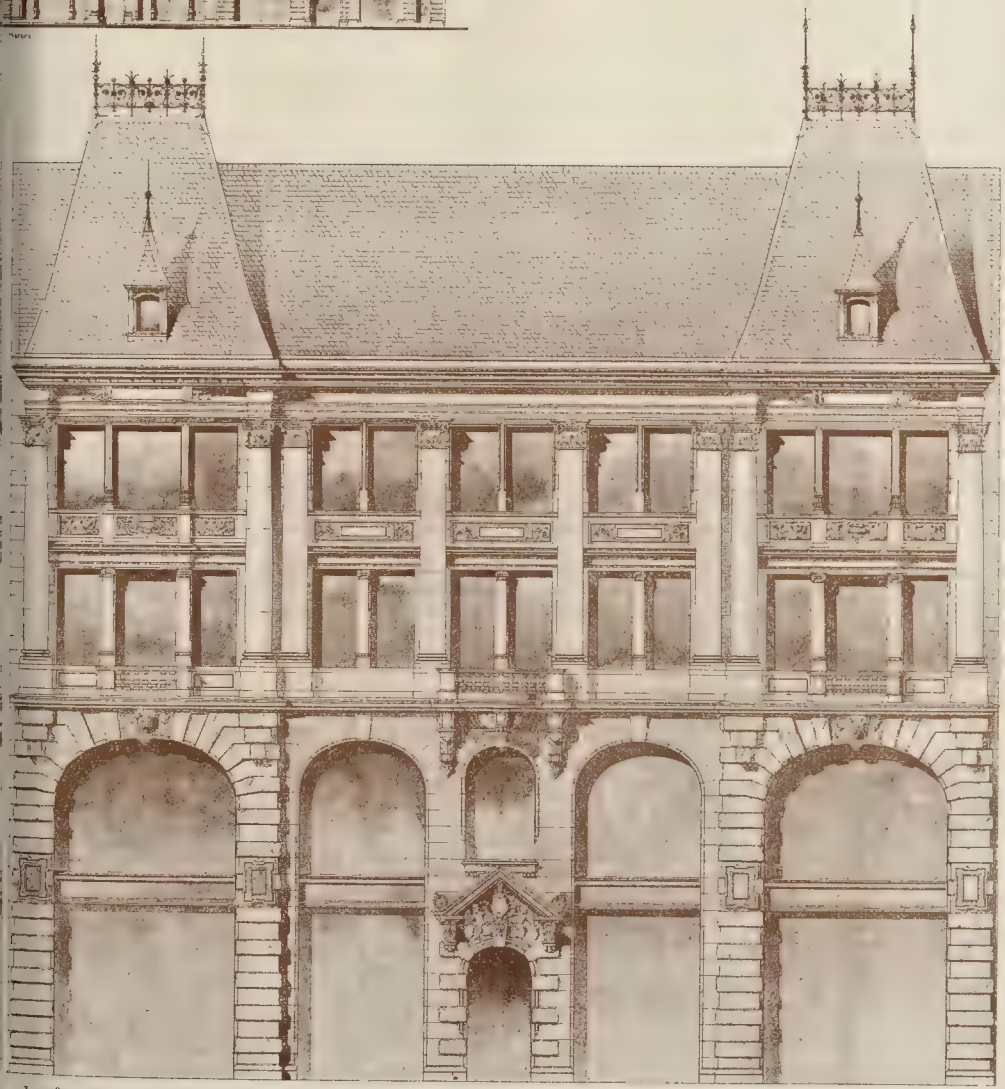
FURTHER SKETCHES FROM PETERBOROUGH.—By Mr. Arnold Mitchell, A.R.I.B.A.



DETAIL OF ANGLE BLOCK.

NCIPAL FRONT.





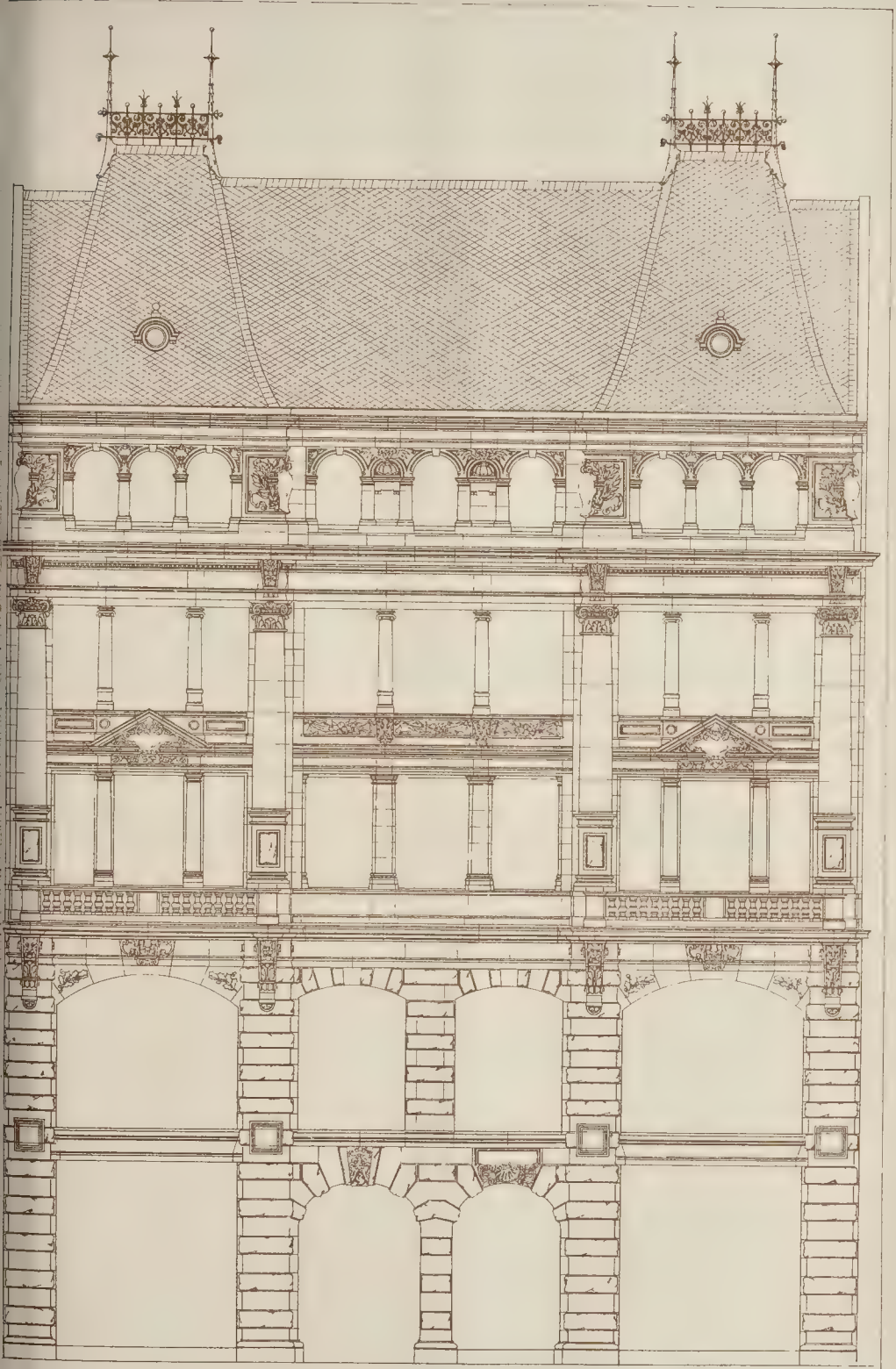
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DETAIL OF END BLOCK ON RETURN FRONT.

INK-PHOTO SPRAGUE & Co 22 MARTINS LANE CANNON STREET LONDON E C

BUILDINGS.—Herr Alfred Messel, Architect.





DETAIL OF CENTRE PORTION OF PRINCIPAL FRONT

BERLIN STREET ARCHITECTURE: THE WERDER-HAUS BUILDINGS.—Herr Alfred Messel, Architect.

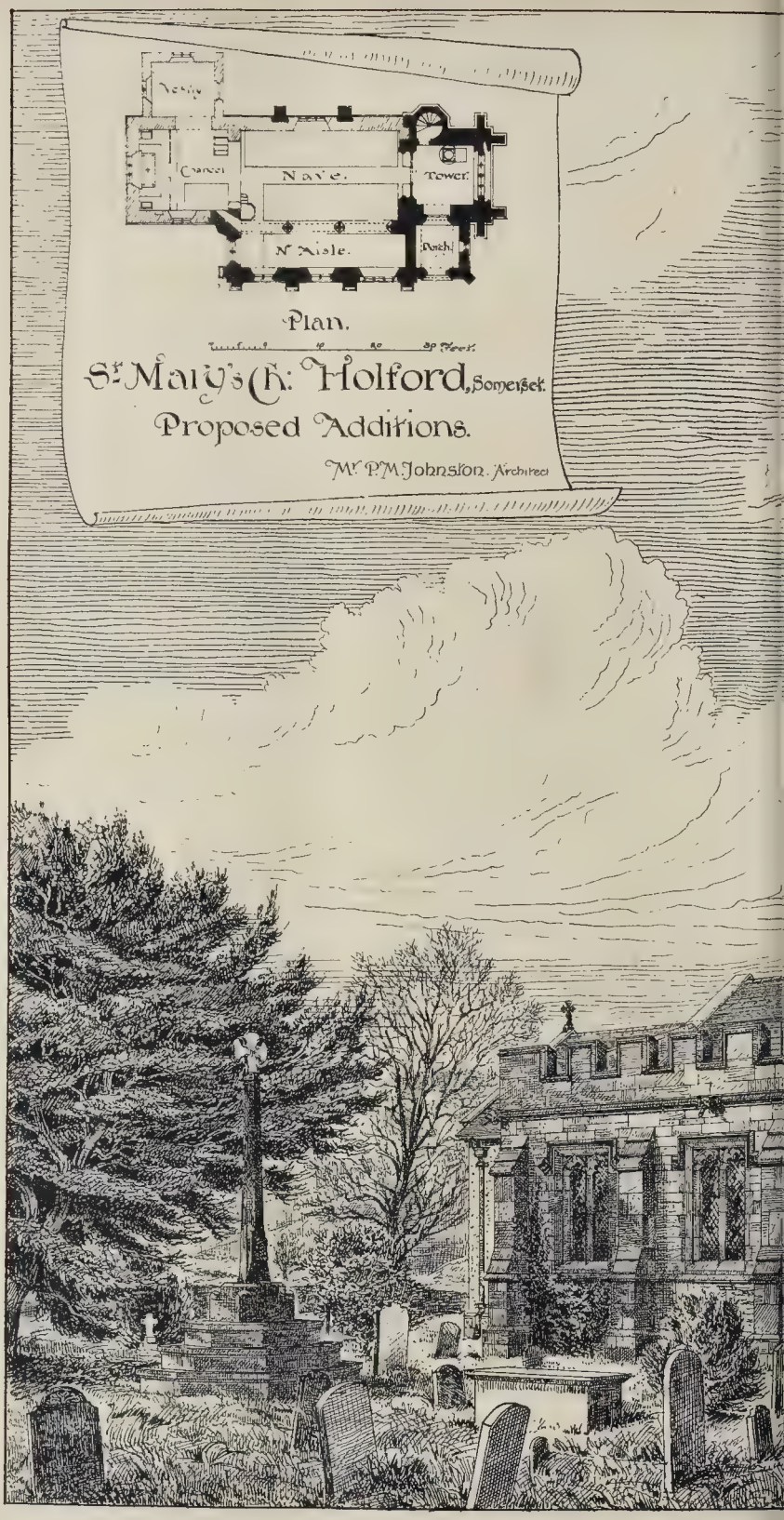
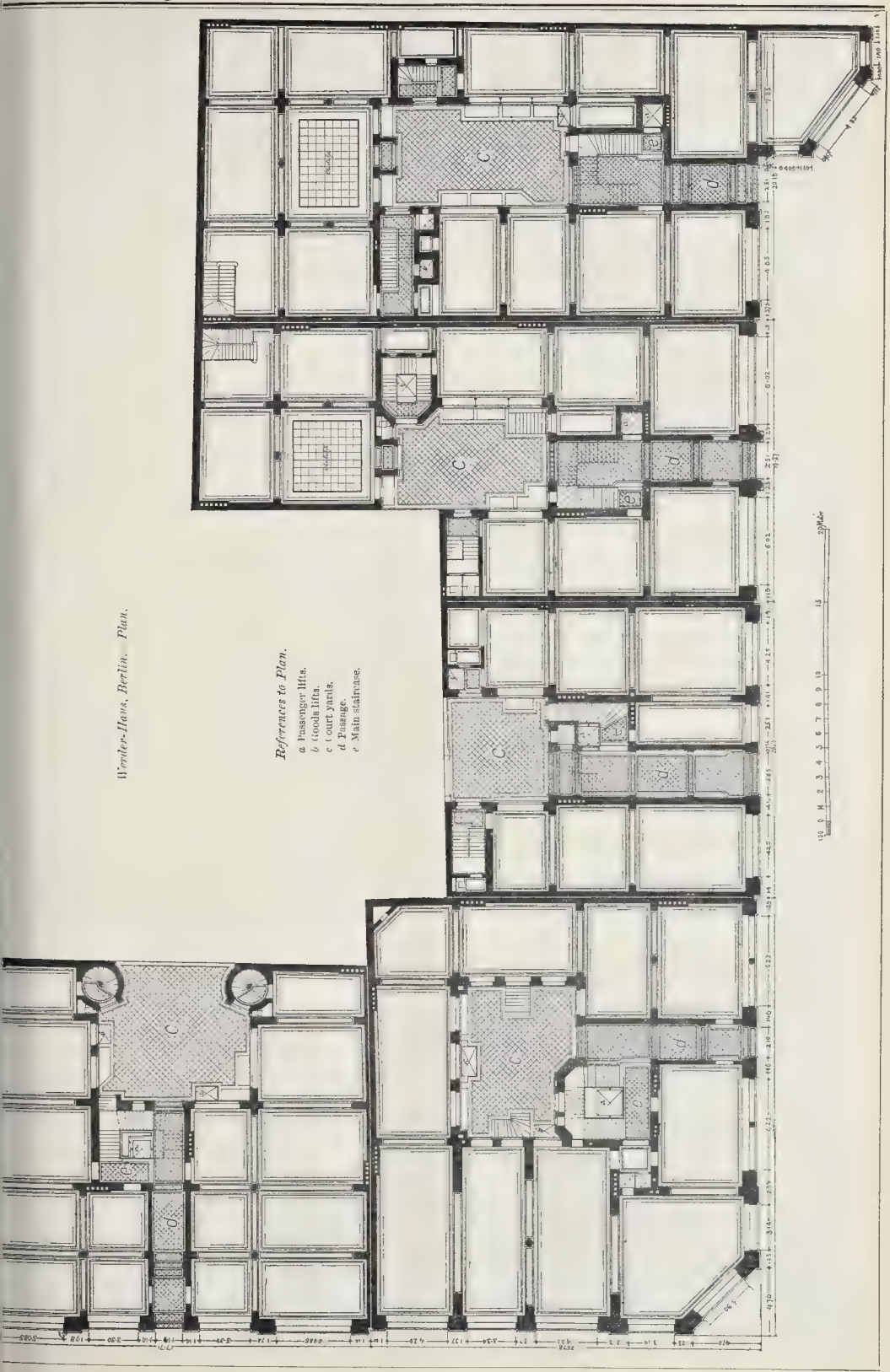

Vestry
Chancel
Nave
Tower
N. Aisle
Porch
Plan.
St Mary's Ch: Holford, Somerset.
Proposed Additions.
Mr P.M. Johnston. Architect



PHOTO L. THO. SPRAGUE & CO. 22 MARTINS LANE CANNON ST. LONDON E.C.



FURTHER SKETCHES FROM PETERBOROUGH.—By Mr. Arnold Mitchell, A.R.I.B.A.


C
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Passage
Court yard
Court yard
Passage
Court yard
Court yard
Passage
Court yard
Court yard

were, and found out how it was built up, he can only have but a superficial knowledge of the secrets which lie hidden within, and are only revealed to those who will carefully and diligently search for them; he is, in fact, only an amateur, not an artist. What is the best way, then, to set about making measured drawings of a building or portion of a building? At first I should, as I have already said, select a small building,—no matter how small so long as it be good,—and do it completely. If such is not available, take some portion of a large building which is more or less complete in itself, such as a porch, a chapter-house, or a tomb even, if it be ecclesiastical work, and show its position in and relation to the whole by means of a small key-plan. If it be domestic work you will find it more difficult to separate a portion, as each part is so dependent on and placed in relation to the whole that it is almost impossible to divide them without destroying the value of the lesson to be learned; but whatever you do, do it completely, and if you cannot do more than a door or a window, make sure that you have all the information that would be required if you had to reproduce that door or window, even to the hinges by which it is hung, or the fastenings by which it is secured, if they are of the same period as the rest of the work, or worth attention for other reasons; and it is advisable, wherever possible, to make a little thumb-nail sketch of the whole, or a sketch-plan showing the position of the door or window measured, and its height above the eye, otherwise your work will be in great measure thrown away. Nothing is more useless than a series of isolated scraps, such as portions of arcades,, windows, &c., with nothing to show their relation to each other or to the whole, and when you have forgotten the exact position in which they were in the original work, they may be misleading even to yourself as they are useless to everybody else. If you cannot make a thumb-nail sketch you can almost always get a photograph, which will serve the same purpose, though it is preferable to sketch it whenever it is possible, the better to impress it on your memory.

After having selected a subject, I find the best way to set about measuring is first to make a small key-plan and elevation, which should be plotted on the spot, and need not be to a large scale, as it is only intended to form a key to your real sizes, and should only give such things as extreme length, breadth, and height, and should not attempt to show any detail. The next thing to do is to measure and draw the whole of the details full size on the spot, putting references from them to your key-plan as you go along, so that there may be no mistake as to where they are. This may appear at first sight to be "putting the cart before the horse," but you will soon find by experience that if you first measure and plot the whole drawing to the scale you propose to draw it, and then proceed to make your real-size details afterwards, you are doing the work twice over, first measuring the details and drawing them to scale, and then measuring them again to draw them out full size, but if you begin with the full size you are able to give the spirit of the mouldings much better when reduced to a smaller scale, because you know what you are drawing, and are not doing your measuring twice over. It will save much time also, and unnecessary running up and down of ladders, if two work together, taking it in turn to plot and to take the dimensions, so as to gain practice at both.

When you have got your mouldings real size, proceed to draw out the whole to the scale to which it is to be finished, which will vary with the size or delicacy of the work, but should always be large enough to show the detail clearly and intelligibly without crowding on the paper. This should always be done on the spot if possible, but in some buildings, such as churches and cathedrals, were it is only possible to work during a short time in each day, between the services, the best plan to avoid wasting time is to measure and draw as much of your real size details as you can in the church during the day, and to plot your small scale drawings from these details at home each evening, and to compare them with the original work on the spot the first thing next morning, so as to correct any errors. If this is done conscientiously it is the next best thing to drawing it in the presence of the actual work, but as I have already said, the other is preferable if possible. When these scale drawings are complete in pencil they should always be taken to the work, and carefully compared with the original, any decorative portions put in, or corrections made on the spot, and the joints always put in from actual measurement, nothing being taken for granted, and nothing put in which is not there. There is no harm, however, in restoring portions which are injured, if other similar features exist, so long as it is noted on the drawing that they are restorations; but no features should be put in from mere hearsay, or even documentary evidence, unless you can find absolute warranty of what was there before. Any additions of a date subsequent to the period of the work you are measuring, and which cover portions of it, or replace old work now destroyed, must be measured, but are best drawn only in outline, to show that they are not part of the original design, and the fact that they are modern should be noted upon them to prevent any misconception. It is always useful to try and find the exact date of the work, and any other particulars concerning it of interest, such as the name of the artist, and the reason for its erection. If you propose to limn your drawings in pencil you must be careful to keep them clean and sharp while working on them, and not to use too hard a pencil, the sectional parts should be tinted with pale ink or colour. If you ink them in you must adjust the thickness of your lines to the scale and class of work, avoiding pitch-black ink, either for your lines or your sections, but more particularly in the latter, for you will find that large masses of black will attract the eye away from the more interesting portions of the work, and give undue prominence to what is of no real importance, and will, in fact, "kill" a delicate drawing. It is not absolutely necessary to use black for either your lines or sections, and some drawings look better in brown or other colours, with sections tinted in a neutral grey, but if you adopt this style of drawing you must adapt it and vary it to suit the particular subject, and, on the whole, you will find it best at first, at all events, to stick to black, so long as you can find it in your heart to depart from the old-established custom of laying on your black so thick that it shines like varnish or Wellington boot-polish.

One word as to the writing, or, as it is more commonly called, printing. Let it be clear and legible, and adapted to the scale of your drawing; but do not waste time in the imitation of all sorts of old fancy types, which are probably quite different to the style of the work you are illustrating, and are mere pedantry at the best. Put your title in a prominent position—the top left-hand corner for choice—and make it larger and more important than the rest, so that it looks like a title. Draw on a scale as well as writing it in words; this you will find most convenient for reference hereafter, and, if at any time you wish your drawing to be reproduced by photo-lithography, will be absolutely necessary. If you must have a line round your drawing to finish it, let it be a single line only, and not too thick; and, above all, avoid the style of decoration at the corners with which we are all so familiar on the lithographed plans of auctioneers, or, indeed, anything of the sort. They are not only mere waste of time, but are useless and vulgar to boot. These may seem trivial matters, but I can assure you that they are by no means imaginary errors, as, from my connection with the A. A. Sketch-Book, I can testify, and, if such trifles were more often attended to, the work of the editors would be considerably lightened.

Having thus completed the whole of your geometrical drawings, you should not consider your work finished until you have made a small perspective sketch to show the general effect of the whole; and you will also find it extremely useful to keep a small sketch-book always at hand while you are measuring, in which you can note any scraps of information, inscriptions, or perspective sketches to show points of detail which cannot be clearly shown in the measured drawings.

A word as to the instruments required. Two 5-ft. rods, a 2-ft. rule for small dimensions, a tape, and a plumb-bob, are all that you will require for measuring, while a common pair of mason's compasses, with the legs bent in a bow shape, will be useful for taking the real sizes; but it is important to remember that by far the best way to draw moulds is to train your eye and hand so as to dispense as far as possible with instruments at all, taking only such dimensions as are necessary to test the accuracy of your drawing; but to depend on any of those complicated instruments which are now made for reproducing a moulding by mechanical means is, in my opinion, a great mistake, as in this way you lose that training of hand and eye which are the primary object of such studies. Be careful that, in taking a moulding, you do so in a place where it has not been worn or damaged, so as to destroy the original contour; but if it has been anywhere broken right through with a tolerably clean fracture this will enable you to see its true section better than in any other way. Another method is sometimes adopted of inserting a piece of paper edgeways in a joint, and then tracing the outline; but this is not to be recommended, as, in the first place, it has a tendency, if done too often, to damage the old work; and, secondly, because it is somewhat mechanical. With reference to the first objection, it is hardly necessary to say that, when you are allowed the privilege of measuring old work, you ought to exercise the very greatest care, so that nothing you do should in anyway cause the slightest injury to the work you are measuring. This, I regret to say, is not always borne in mind as carefully as it should be, and has been the cause of *bonâ-fide* students being sometimes denied facilities for measuring certain buildings where damage has been caused by others who preceded them.

Next in importance to measuring, as a means of studying old work, comes sketching in perspective, or perhaps it would be more correct to say, equal in importance, for one is a corollary of the other, and neither is complete without the other; and nothing more absurd could be imagined than the acrimonious discussions with which we are treated from time to time on the rival merits of measuring and sketching; just as though the two were in any sense antagonistic, and the practice of both was not essential to enable us to obtain anything like a complete grasp of the feeling of old work.

Sketching in pencil, pure and simple, is probably the means which will be adopted by most students at first, and I do not know that they could choose a better. For, in addition to being a rapid, simple, and portable means of drawing, for architectural purposes it has few if any, equals, and in the hands of an expert draughtsman, the results to be obtained from it are multifarious.

Of course, as a preliminary to sketching, the student should first know something of the laws of perspective, so as to enable him to know how to draw correctly; for though sketching is an art only acquired by constant practice, yet perspective is a science, governed by fixed laws, and unless he has studied the science first, he will never succeed at the art, and his practice will be time thrown away. I do not say that everyone who is conversant with the laws of perspective must draw correctly; far from it; but it is evident that a man who knows nothing of perspective *cannot* draw correctly; therefore a knowledge of perspective must be regarded as the basis of and preliminary to the art of sketching.

For materials I think you will find smooth paper,—such as Whatman's hot-pressed,—and a rather soft pencil, about H B quality, the best. The smooth paper takes a clean firm line and the softness of the pencil allows you to work with facility without damaging the surface of the paper,—a great desideratum. A small board, a wood frame, or a sketching block, will be found the best to work upon, but T-squares and set-squares should be eschewed as far as possible, and the hand trained to do without them. Another thing to be avoided is india-rubber. It should be used as little as you can, for its absence will inculcate a habit of considering what is the meaning and function of every line before putting it in, and this is the test of good sketching.

When you have accustomed yourself to sketching without india-rubber, you will find the smooth-faced metallic paper very delightful to work upon, and lines drawn upon it have the advantage of being indelible; consequently there is no fear of your sketches rubbing in the portfolio; but on this paper a line once put in cannot be rubbed out without damaging the surface; hence you must make up your mind exactly what you are going to do before attempting to do it. It is more suitable for sketching than for finished drawings, as lines cannot be worked over more than once with advantage, nor is it suitable for colour-washes.

It is advisable, especially at first, to draw everything to as large a scale as you can, for, in addition to the sketches being much more valuable to you afterwards, you gain a much greater knowledge of the detail by this course and this knowledge will afterwards enable you

n sketching on a smaller scale to give by a lines the spirit and effect of a collection of ldings, which you would not have been able lo had you not studied those mouldings on rger scale first, and it is just this power of ing on the necessary lines and omitting the ecessary ones which is the chief test of good ıghtsmanship.

his is a matter of practice, however, and at you should strive to make your drawings n and straightforward representations of t you see before you, not seeking to imitate little tricks and dodges which you may over in other men's work, for when they are your own and the result of experience, they mere affectation, and will always appear as ı on your drawings. In time you will elop various little mannerisms, quick ways otaining certain effects, almost unconsciously yourself,—in fact, a style of your own, ıded on your own observation, the result of r own experience. And whether this style ı good or a bad one depends very largely n the care with which you sketch in your y days. Other men's drawings should be lied at this period, not to copy or merely to .cise, but with the earnest desire of discover- how they obtained their effects, what it was r intended to convey, why they did it in a .icular way, and if it was the best way iible under the circumstances.

style of drawing has of late been developed ome men, which has, in my opinion, much commend it, but which, if adopted by others . mere spirit of copyism, and without grasp- the objects or limitations of the style, ld, I feel sure, result in failure. I refer to method of using slight washes of colour or ıochrome in conjunction with pencil .ches.

, has several advantages, among which I mention that it may be used to suggest the ırs of the various materials of which the .ding is constructed, or to give force to .ain portions of it, and is a rapid way of wing large masses of shadow. It also has practical advantage of "fixing" pencil .ches, so as to prevent their rubbing; but ı those who use it most successfully it is le merely a conventional representation of colours and values of the different parts, . no attempt is made to give the real force strength of the colours or shadows, or, in rt, to make it a picture, in which grouping, ance, and composition would have to be sidered. But a tyro seeing some successful wings made in this manner and anxious to y their style would find it very difficult to w where to draw the line between mere ventional representation for architectural poses and the attempt to produce a picture. knowing the full force and significance of colour washes he would probably find he given importance to what should be lued, and left in obscurity what should be ed. I mention this as an example of what angerous thing it is to adopt the style of ther man, unless you know precisely what e his intentions or his reasons for working particular way, and consequently that any hese new methods should only be taken up ı caution, and a full knowledge of what are about. At first I should say, stick to il work.

he question has often been discussed as to ther sketching in water-colours is of any tical use for architectural purposes, and e who practise this class of drawing are n accused of being mere picture makers. , if you will consider again for one moment proposition we started with, viz., what is object of sketching? and if you admit that solution given of that proposition was a ect one, I think you will have no difficulty nding an answer to the question. The third hose objects was "to observe the proper and functions of different materials, and best means of combining them for artistic ct," and I would ask how is it possible to y that most important factor in all itectural effect, viz., colour, unless your wings of such effects are made in colour, what better method is there of repre- ing the poetry of light and shade a building than by the broad washes h show what is in shadow and what is in , and give the true balance of voids and ds? It may not be so important in our cold hern clime, where the sun is so chary of ing us that we are thankful even for an sional glimpse of it, but to draw the front n Italian church, without giving the effect of the cast shadows, would convey but a very false impression of the original, and would be very much like the pieces of music which one sometimes hears played, all *forte* and no *piano*. I think, therefore, there can be no doubt that sketching in water-colour, if properly carried on, is most unquestionably of value to an architect, but I will not go so far as to say that it is essential. When I speak of water-colour sketching,—"properly carried on"—I mean that the author should not merely seek to transfer dashy effects of colour to paper with no reference to the form or material of which it is constructed, but that he should strive as nearly as he can to represent both the form and colour of a building, and the play of light and shade produced by its mouldings and other features; nor should he be content with this, but should always make small sketch sections of the mouldings or other features to supplement his water-colour drawing. Carried on in this way I think water-colour may be a most valuable means of study to an architect.

As to how far, however, an architect should go in the direction of making his water-colour drawings artistic compositions or pictures must depend upon the individual taste and ability of the artist. This much can be said with certainty, that it is quite possible for him to be a thoroughly competent architect without such a power, but if his tastes do lie in that direction, by all means let him cultivate them, for such an accomplishment must have a refining influence upon the mind, and will accustom him to see and think as an artist when he is designing.

There is an additional reason why water-colour sketching should not be neglected by the architect, and it is that it forms a means of studying the polychromy of old buildings and their surroundings, instead of restricting one's self to their form alone, as many of us are too apt to do. Colour is a subject with which every architect is called upon to do something sooner or later; whether it be in so arranging the stone and brick or other materials of which a building is constructed as to form an agreeable combination externally, or in selecting such a colour for his wall-papers or his paint as to give a comfortable and harmonious effect internally; and how is he to execute this part of his work properly if he has never thought it worth while to study the important part that colour plays in all works of art? The whole effect of the architecture of a building may be altered, either for better or worse, by means of colour applied to it,—its very proportions may be made to look different,—surely, then, some insight into the laws of harmony, contrast, and complementary colours would appear to be a necessary part of an architect's education. Since writing the above, Mr. Waterhouse has chosen this subject for his address to the students at the Royal Institute of British Architects.

Chalks or crayons will be found useful for some classes of drawing, more particularly for sketches of carved ornament in the round or in relief sculpture, and other decorative work. The modelling can be more easily shown, and with greater delicacy and gradations of shadow more truthfully rendered by using chalks than is possible with pencil, which is not sufficiently free for this class of work; and here, again, the colours may be judiciously selected to suggest the material of which the original is made. Probably the best way of studying ornament of this description is by modelling it in clay, but one has not always the facilities when on a sketching tour for obtaining the necessary materials or for transporting the models when made.

Pen-and-ink drawing as a means of illustrating architecture has of late become very popular, owing, probably, to the fact that by the improvements in the various processes of reproduction large numbers of copies may be easily and cheaply obtained, and for publication, of course, this is of great importance. In the hands of some of its best exponents the effects produced are bright and sparkling in the extreme, and the cleverness with which the different parts are made to stand out from each other, by the alternate use of dark upon light and light upon dark, gives an interest and variety to the drawing which is very charming; but we must not deceive ourselves into the belief that these are architectural drawings, or of any great value to the architect as studies of old work. In that they interest the public, and so popularise our art, they are or may be of great value to us indirectly, as showing the poetry which an artistic eye can discover in what to many is only so much bricks and mortar, but they are not the means by which a young student should attempt to study his art in the first instance,—something much more painstaking than this is required, if we wish to become competent architects. In saying this I am only referring to the advisability or the reverse of adopting such a style of drawing as a means of studying architecture, and I do not wish for one moment to decry the value of sketches in black and white for illustrating some of the most interesting examples of our art, or the pleasure which we derive from their contemplation, but I simply wish to point out that it is not by such means that a young man should expect to learn very much of the details of his craft. Taken alone, it may make him an architectural artist, but it most certainly will not make him an artistic architect.

There is one direction, however, in which this class of work may be of use to us. Many young men at the commencement of their careers are in the habit of making perspective drawings for their older or more successful brethren, who have not the time or inclination to make them for themselves,—and, shall I say, in some cases have not the power to do so either. If it should fall to a young architect's lot to have this class of work to do, a study of some of this black and white work by such men as Joseph Pennell, Herbert Railton, Raffles Davison, and others, will be found of the greatest advantage, as it will enable him to see how an architectural artist looks at and interprets architecture, as opposed to the way an architect looks at the same thing. And one of the first things he will have to learn as an architectural artist, will be that he must not attempt to put in every moulding and every detail because he knows it is there, but must strive to obtain some definite effect, and learn how much he to must leave out to obtain it. To think more of the masses and less of the lines. But this is straying somewhat from the realms of architectural sketching into that of architectural drawing.

I have only one more method for studying old work to examine,—viz., that of taking rubbings. This is used principally for reproducing brasses, inscriptions, or very flat enrichments, and is done, as you probably all know, by means of laying a sheet of continuous cartridge or lining paper over the object to be rubbed, after having first carefully cleaned off any dust or grit from the surface, and then rubbing over the paper with heelbore. It is very seldom that you will be able to obtain a perfect reproduction in this way, as some of the relief will be often injured or too low to "take" perfectly, and these must be put in by hand afterwards; unless, too, it is made merely for the purpose of reducing to scale as part of a measured drawing, you will find it a good thing to black in all your darks so as to obtain an even tone, and to mend any defects in the rubbing. You should also take a few particulars in your note-book of the tomb or other object it is from, to show its position with reference to the whole, and make a small perspective sketch of it. Any heraldic emblazonments or coloured enrichments should also be noted. There are two objections to this class of study,—the first is, that it is apt to become mechanical and brainless labour, from the manner in which it is done; and, secondly, that when done, it shows the object exactly as it is isn't,—if I may use such an expression. That is to say that, like the negative of a photograph, all the darks are lights and all the lights are darks, and consequently in referring to it afterwards we do not obtain the true effect of the original.

Now both these objections may be obviated very simply, but I regret to say that they very seldom are in actual practice. If after the rubbing has been made we were to lay it down and make an outline tracing of it, and then proceed to put a slight wash of colour over the ground, so as to bring out the pattern as in the original, we should obtain a true effect and at the same time draw in the ornament by hand, instead of having mechanically reproduced it.

I have now glanced at the uses of sketching, and the methods usually employed for carrying them into effect; it only remains to say a few words before I conclude upon some of its abuses, for sketching, like many other good things, is liable to be abused, and very often is so.

In the first place, sketching should never be

taken up with the mere object of making a collection of pretty bits, to be afterwards introduced into your own designs and palmed off on a confiding client as your own work; it should not be used for cubbing, in short; if that is your object, you had far better burn your sketch-books and throw away your measuring-rods at once, for you are not an artist but a mere copyist, and are indulging in a pernicious habit, which is certain to result in failure. Dealing with this question in the same lecture to which I have already referred, Mr. Street said,—"I would never have you draw and sketch existing examples with a view to copying or reproducing them. That is wholly contrary to right principles. What I wish is that you should draw so much of them as to find yourselves penetrated with the feeling of architectural form and perfection which, as the results of centuries of development, have been discovered to be the best; and you are to use them, not that you may steal from them, but that you may be able to deal with the problems that come before you with the same spirit and power that they show, whilst you avoid with care the failures and mistakes which you may discover in them." That is the spirit in which sketching should be taken up.

Another pitfall in the path of the young draughtsman,—aye, and the old draughtsman too,—is the habit of making careless or inaccurate sketches which only half explain themselves and leave you quite in the dark as to the details of mouldings and other features. Careless sketching is a most useless occupation, for it does not give you the very information which you, as architects, require, viz., the means by which the effect you admire was obtained, and when you refer to your sketch-book some time after to see how such and such a thing was done, it will only result in annoyance to find that you have not got the very information you require. But if careless sketching is useless, inaccurate sketching is dangerous; for this not only does not give you what you require, but misleads you into the bargain by showing a distorted representation of the real object, and will convey false impressions to your mind which are not easily removed. If the eye is to be trained by a study of old work it is essential that that old work should be correctly drawn, or, at all events, as correctly as you are able to draw it, not hurriedly and imperfectly. For this reason it is a bad thing to attempt to draw too rapidly at first — that will come with practice, — it is better to err in the other direction, making your drawings as simple and careful as you can; by this means you will acquire a better knowledge of what you are doing, and will be able in time to take a note of what you see rapidly, but effectively.

If you are only taking a pencil sketch, you will always find it usful to you hereafter to note down the materials and their colour, as, though you may think at the time that you will remember them, you will find after a year or two that without such notes all recollection of these things will have passed away, and your sketch merely speaks to you as it is. To obtain any real and lasting good from a travelling studentship, it is necessary to use your head as well as your pencil,—to think as well as to draw, while studying what is before you.

It is necessary always to bear in mind that sketching and measuring are merely a means to an end and not the end to itself, and should only be used with the object of obtaining a knowledge of your art, as practised by your predecessors.

An architect's sketches should, in the first place, be workmanlike, drawings for his own information and guidance, but they should be sufficiently clear for others to understand them as well as himself, if necessary. In making details all repetitions of similar parts should be avoided as unnecessary, and as savouring too much of mechanical perfection, and when once you have shown what there is in the design, leave it, after showing how the repeats occur. This is a matter in which drawings prepared for show very frequently err, from the reason that they *are* prepared for show and not for use.

There is one more danger to guard against in sketching, and it is that the constant study of old work is liable to make us more of archæologists than artists, unless we always keep before us the object of sketching, and I think that a useful antidote is to study at the same time some of our best modern work. As to now far an architect should go in the pursuit of archæology is a matter of taste, and it is a question upon which much diversity of opinion exists, but this I think I may say, without fear of contradiction, that, archæology being a science and architecture an art, we must not mistake the one for the other. The two are not antagonistic, so long as we keep the science subordinate to the art; on the contrary, archæology should be the "hand-maiden" of architecture, but once let our archæological researches outweigh our artistic instincts, and our work becomes mere dry bones and senseless copyism, without a vestige of originality to arouse the enthusiasm of those who come after us. Mere copyism may pass current as architecture for the time being, especially if it is correctly done, and shows a knowledge of the style copied; but succeeding generations, the fashion having passed away, will be able to appraise such work at its true value. Let us sketch, therefore, with the object of finding out how our predecessors achieved their ends; and, having done so, let us endeavour to do whatever comes to our hand to the best of our ability, with the object of making it as suitable for its purpose as possible, and so that those who use it may find pleasure in it. If we do this, no matter with what success, we shall, at all events, be consoled with the reflection that we have done our best,—and no one can do more.

Books.

Some Principles of Everyday Art. By Lewis F. Day. London: B. T. Batsford; 1890.

THIS appears to be, from the preface, a re-writing of a former work of the author's on "Everyday Art," to form an introductory volume to the author's "Text-books of Ornamental Design. He takes the view that "ornament is the art of every day." We may or may not go to picture galleries and such other shrines of art, but ornament, good or bad, is with us every day. The book has in fact a considerable similarity to the author's text-books; we meet with the same kind of illustrations, and the principles that are affirmed in the text-books are here affirmed in rather more general terms, but often in somewhat similar language. Considering, however, that Mr. Day everywhere upholds, in the literary part of his work, the standard of conventionalism, we are a little startled by the illustration of the very naturalistic example of ancient Etruscan gold work on page 33, as "Goldsmith's work of the best type." It is beautiful workmanship, no doubt, but far too naturalistic in feeling and form.

The truth about decorative painting (an expression often very carelessly used) is well stated on p. 40. "It is only on the summit of art that the pictorial and the decorative join hands. One may start with the idea of painting a picture, and end by making it conform to all that is necessary to decoration. Or one may begin with a decorative scheme, and carry it to the farthest point of pictorial perfection. Parnassus, that is to say, may be climbed from two opposite sides; and a man is classed as painter or decorator, not according to the height he may have reached, but according to the side from which he set out." There is a good deal of truth in this; a truth not always recognised. Very true also is the criticism on page 53, that "wherever a detail is to be repeated it is essential that the natural element in it should be toned down and made subsidiary to ornament:" a principle which is universally illustrated by all the repeated ornament which has by the common consent of mankind been regarded as the most successful. "Nature brings forth herbs and flowers answering to all human needs; but her scope does not include the art of domestic decoration." That is left for us to do, with the materials she furnishes.

In regard to the ornamentation of articles for practical use, Mr. Day says with truth that when a savage carved the handle of his tomahawk, the carving was just sufficient to give him a tighter grip of the weapon; "he would take very good care not to cut so deep as to weaken it," an æsthetic indulgence which might cost him his life. And so, as he goes on to remark, the only modern implements that are never overlaid with misplaced ornament are weapons, tools, things of actual use, which would be injured for their practical purpose by such ornament. The modern rifle is a more true work of art, in a sense, than the clumsy but elaborately carved arquebuses which find place in South Kensington Museum. This our remark, not Mr. Day's; but it natura follows from his principle.

All this has been said pretty often lately, b Mr. Day says it very effectively, and his illu trations are always apt, and (still great merit) are nearly always pretty and attracti in themselves. We sometimes come acr books on ornamental art in which the illustr tions serve to explain the principles, no dou but also go to prove the melancholy truth th the possession of correct principles will r always prevent a man from making very b drawings. Some few of Mr. Day's illustratio are not happy, but they are in a small minori Most of them are a distinct pleasure to the e as well as the judgment. Perhaps the v best of them is the bird sketched in bru strokes (page 98).

Stable-building and Stable-fitting; a handb for the use of architects, builders, and hor owners. By Byng Giraud. London; B. Batsford; 1891.

THIS small book represents a summary of t author's practice rather than any attempt show what stables should be on princi Stables, we read, "are now constructed" this or that way; whether this is the best w of constructing them the author does not ap rently profess to say. The book is illustra by a number of diagrams showing plans stables, details of mangers and other fittings These latter are useful, as they bring toget a good many different methods of making fittin and enable the reader to compare them w one another. Some of the remarks as to mo of building construction do not apply to stab any more specially than to other buildings, s hence are rather wasted in a small book tended to give special information. And general the plans given are somewhat comm place and much open to improvement; t may be useful to an architect in suggest arrangements for the economical housing horses, but they are arrangements often capa of being much improved upon. It may a questioned, indeed, whether practice in buildi for such clients as large omnibus companies a other employers of a number of horses trade purposes is by any means the best sch for stable building; economy of space and c struction is sure to be made such a promin consideration in these cases. A country gen man who found his small stable for four hor planned as in plate 11, with the harness-r opening out of the end of the stable, wo probably complain of his architect for arrangement which would not allow of harness being kept in the best condition. harness-room should always have a doub door or lobby interposed between it the stable, one of them a swing d so as to cut off the connexion, where harness-room entrance is not a separate altogether; otherwise the harness will not preserved in that bright condition which private carriage owner demands. The ro ways of an omnibus company's stables, whe as the author tells us, the harness is hung alongside the horse, are no school for priv stable-building. This defect occurs in nearly the plans shown for private stables. A general rule, again, stable doors are made narrow, and are often placed in such p tions that the horse has to be twisted at in getting from his stall and out at the d and there is no improvement on this in plans shown here, except in what the aut gives as "General Fitzwilliam's plan" (p 56), a cavalry stable plan (apparently) wit wide centre aisle and a high arched door at 9 ft. wide at the end of it, the stalls ranging either side of the central aisle. There is course a special reason for this very wide in a cavalry stable, but private stable d should be 5 ft. wide; they are nearly all sh 4 ft. in this book. The manner in which door is cornered in the plan on plate 1 absurd; it could hardly be worse placed. a quiet horse would have to be carefully loc to in being led past the angle of the loose and then edged round to get clear through door; and a restive horse might get himself his groom into great trouble. In regard ventilation the author seems to believe some mysterious and occult power in tract-cowls, before which he bows d as before a process of nature, w he describes in words that are not very telligible to his readers, or perhaps to him

The method shown of inlet ventilation in General Fitzwilliam's plan, a small window over each horse, hinged at its lower edge and falling back inwards when opened, is one of the best methods of supplying air to the horses, but the author does not draw any attention to it in the remarks on ventilation. Where, from necessity, stables can have openings at the end only, as in some positions in towns, there should be special means for conveying fresh air to the horses, instead of allowing those in the centre to breathe the air that has been breathed by the others. Horses want pure air in their dwellings nearly as much as human beings; perhaps their health is not quite so dependent on it, but it must be to a great extent, and to our thinking each horse should have his own air-supply, in such a manner as to reach him without draught.

As a small and inexpensive work, Mr. Giraud's book has its use as a summary of the fittings wanted in a stable, and the manner in which they are usually made; but we should not recommend his plans of stables as models by any means, nor can we say more for the elevations.

A Guide to the Exhibition Galleries of the British Museum. With Maps and Plans. Printed by order of the Trustees. 1890.

This guide to our great Museum is a real boon. It is small enough to carry in the hand, and contains sufficient information to enable any generally educated visitor to understand the archæological bearing of all the important classes of exhibits. Of course it is not a popular guide for the uneducated; as Mr. Maunde Thompson says in his preface, "It does not lie within the scope of such a work to supply information which it may be supposed has already been acquired in the ordinary course of education. For example, the main facts of Greek and Roman history and mythology are within the knowledge of most, and any deficiency may be readily supplied from the numerous books of reference. But an exception to this principle has been allowed wherever previous acquaintance with a subject cannot fairly be expected."

A plan of the Museum itself is given, with references to the place where each class of antiquities is to be looked for. A most useful addition to the guide is the insertion of maps of the countries from which different classes of antiquities are brought (Mr. Frederic Harrison, we presume, would say they ought all to be taken back there), so that the geographical relations of site can be identified in the mind with the objects found there; which is an important aid to archæological memory. The notes on the Egyptian antiquities are preceded by a short sketch of Egyptian history, and of what is known as to the manners and life of the ancient Egyptians, without which knowledge the collection is only half comprehensible. The guide to the Greek and Roman vase-rooms is prefaced by a general chapter on vases, with small outline drawings showing the typical shapes and nomenclature.

We presume that a re-issue of the guide is intended at periodical intervals, as we observe that there is a chapter of analysis and description of the drawings at present on view in the large Print Room, which of course is only a temporary selection.

The whole is admirably done, the compilers having had the perception where to stop in a work of this kind, and how to sum up a great deal of information in a small space, so as to keep the book to a convenient size. We hope it will be largely used, to the promotion of a more intelligent understanding of the contents of the Museum on the part of the mass of visitors, who are apt to wander somewhat aimlessly through the great collection, enjoying much of it no doubt, but not realising its historical significance.

New Reredos, Wickersley.—On the 4th inst. a new reredos which has been placed in Wickersley Church (St. Albans'), Rotherham, to the memory of the late Mr. Wm. Aldam, of Frickley Hall, was dedicated at a special service. The memorial is Caen and Roche Abbey stone, and is in three divisions. The centre panel represents the call of St. Peter, and the side panels portray the Resurrection and the Ascension. The panels are separated by clustered columns, with moulded caps and bases, while the upper part is filled with tracery in the style of the Perpendicular period, and finished above with an embattled cornice. The work has been carried out under the superintendence of Mr. E. Isle Hubbard, architect, Rotherham.

Correspondence.

To the Editor of The Builder.

BYZANTINE ARCHITECTURE.

Sir,—In the South of England, — Kent, Sussex, Surrey,—a species of concrete construction is very common, and has been in use from the remotest times. Walls of 12 in. thick, or as much thicker as may be required are to be found.

Land flints, pieces of brick, or other hard stuff are bedded in mortar. At intervals, vertical brick courses are introduced, and about 3 ft. apart, horizontal brick courses, — "lacing courses," as they are called. No external facing of brick is used. The wall is, in fact, of concrete, the whole done with the trowel, and layers of stones laid in. A section through a thick wall of this nature is such as Mr. Aitcheson describes.

At the south (the church stands N. and S.) end of St. Patrick's church, Brighton, is a wall constructed in this way that is fully 80 ft. high from the footings to the gable. It is about 3 ft. thick. It has stood perfectly for some thirty years.

Walls of Norman structures were built in this way, but with the flints close together on the outside to form a facing. If the mortar is good these walls are very strong.

At Blatchington, on the Downs just above Brighton, is an Early Norman church. It has been roofless for at least 250 years, and yet the walls, where not overthrown by violence, have stood.

This church is now being roofed once more. New walls, where required, are built with the old flints in the old traditional way, and the old walls carry the new roof with perfect security.

In speaking of Roman concrete, I think there can be no doubt that we should not use the term "poured in." The material was in most cases "laid in." Somers Clarke.

15, *Dean's Yard, Westminster, S.W.*

COMPTON WYNYATES.

Sir,—I am obliged for "N. S. W. East's" letter in your issue of March 28 [p. 253] with reference to my drawings of the above.

The plan, &c., will shortly be published in the "A. A. Sketch Book" when satisfaction will be tendered on this point. Until then I must ask "N. S. W. East" to accept the names given to the elevations as being moderately correct. The chapel is on the right of the court on entering.

Heber Rimmer.

6, *Abbey-square, Chester.*

VENTILATION.

Sir,—I am much obliged to the writer of the review on p. 274 for pointing out the misprint on p. 137 of my book: 37,555 linear feet was the amount in two hours, and it should either have said, "or 313 feet a minute," or else the words "a minute" should not have appeared.

W. P. Buchan.

Glasgow, April 4, 1891.

The Student's Column.

VENTILATION AND WARMING.—XIV.

APPLICATION OF ARTIFICIAL VENTILATION.

In any application of artificial ventilation one of the first questions to be determined is the centralisation or de-centralisation of either or both of the two distinct portions of the apparatus, the motive power and the heating power. As a general principle centralisation is usually the more economical, both in first cost, working expense, and supervision or attendance, but no hard and fast rule can be laid down which will hold good in all cases. Each particular problem must be dealt with on its own merits and with a consideration of its peculiar attendant circumstances.

With buildings of simple character, that is, as regards their ventilation, such as churches, theatres, and concert-rooms, centralisation will, of course, in the majority of instances, be preferable, but in dealing with large complicated structures, especially if they contain various portions used under varying circumstances, such as are many of our municipal buildings, for example, it is often advisable to subdivide the ventilation scheme into groups, so as to save the cost of running machinery which is not absolutely being used.

To determine in each particular case what is the best principle to adopt, we must work out in detail for each arrangement, which we can conceive feasible, the first cost and working expenses, including cost of attendance, taking care to so plan each arrangement that similar and adequate results will ensue from each. Only in this way can we rightly decide whether it is better to use, say, one large engine instead of a number of smaller ones, one fan or several, and so on through the whole category.

With the heating appliances, in particular, careful consideration must be made of the various solutions of which the problem admits. It is always a question open to debate whether, in any particular case, it is better to warm the fresh air in a central situation, and then allow for the deperdition of heat during its passage, or to convey the heating agent to a closer proximity to the locality of use. As a general rule, it is advisable to warm the fresh air as near as possible to the point of entry to the apartment; but this is not invariably the case. Much depends upon the form of heating agent used, and, conversely, the advisability of one or other form of heating agent will result from the superior facility for centralising or decentralising the heating power.

In any de-centralisation of ventilating apparatus, one point must especially and most carefully be borne in mind; there must be no chance allowed of one portion of the apparatus acting against another. This is a point most frequently neglected in the matter of outlets. It is no uncommon thing to find a number of extractors, especially of the automatic kind, so arranged that it is almost an impossibility for some of them to avoid drawing air down some one or more of the others.

Another important question that has to be determined at an early stage of the design is whether propulsion or extraction is to be the principle adopted. As we have already stated in our last chapter, the question briefly resolves itself into this, extraction is less costly, but more draughty; propulsion more expensive, but more effective, while perfect success can only be rendered certain by a combination of the two methods, at a further increase of expense.

The question, therefore, is entirely one of pounds, shillings, and pence. The best ventilation is the most expensive, but if the public will not pay for the best, they can have a cheaper but less satisfactory result. The adoption, however, of the dual principle of extraction and propulsion does not necessarily mean doubling the cost, although it does imply some increase. Although in their account of the magnificent scheme of ventilation carried out at the Vienna Opera House, M.M. Demimuid and Herscher appear to consider the second or aspirating fan of little use, it can hardly be logically contended that in the dual method one or other of the motive agents is useless. We are familiar in every day life with the spectacle of a man pushing behind a cart to lessen the strain, and assist the horse that is pulling the load up hill. Neither the horse nor the man alone could probably do the work, but the combined efforts effect what would be too much for either. Somewhat in the same manner is utilised the energy of the dual motive agents in a combined scheme of ventilation. Indeed, with an elastic fluid like air it is more easy to combine the force of a pull and a push than in the case of the cart. If, therefore, the dual method is adopted, it is not necessary to make either of the motive agents so powerful as to be able to do all the work singly. In the Vienna Opera House, which, we must remember, was to a large extent an experimental installation, the motive power supplied is undoubtedly in excess of the minimum necessary, and the excess may possibly amount to the whole work done by the aspirating fan. If this is so, the proper method of economising is not to omit either of the motive agents, but to reduce the magnitude of both. Thus the unquestionable advantages of the dual method would be retained and the expense considerably reduced.

The point of intake for the fresh air is a matter of some moment. This should, of course, be selected primarily with a view to the purity of the fresh air, but also with some consideration for the length of duct involved. The nearest point from which the purest air can be obtained should be selected. It is sometimes fancied that the purest air can be obtained from the highest external part of the building; but, in London at any rate, this has proved to be a fallacy, as the upper atmosphere is more heavily laden with smoke and other impurities. Probably, as a general rule, the purest air will

be found at a height between 10 ft. and 15 ft. from the ground.

Arrangements for cleansing or cooling the air may be then considered. Of these we propose to treat in our next chapter.

The planning of the ducts must have very careful deliberation. In the first place they must be so constructed as to minimise the loss of power resulting from friction and changes of direction. Inattention to this may very seriously jeopardise the efficiency of a scheme, while in ventilation, as in all other architectural matters, only a well-conceived and carefully thought out plan will give adequate return for the expenditure. An interesting illustration of the effect produced by the varying obstruction of the ducts in different instances is seen in the report prepared by the late Professor Carnelley for the School Board of Dundee. Amongst other examples, Dr. Carnelley gives the resulting efficiency of three fans of the same make and size driven by gas-engines also of similar make and power. Notwithstanding the equality of the initial motive agents, the volume of air moved per cubic foot of gas consumed varied enormously, the figures being 14,786 cubic feet, 22,992 cubic feet, and 30,727 cubic feet respectively. From these figures it appears that the first apparatus is doing less than half the efficient work of the last, and this is the kind of result that may frequently occur, unless care is taken to prevent it by a well-designed system of ducts.

Another point in connexion with the designing of ducts, which often receives far too little attention, is their equality of resistance. If this is not attained, it will happen that the delivery or the exhaust of air at different points of the same apartment or building will be of unequal volume and velocity, possibly with a resulting draught or else with inadequate ventilation at some points. This is a matter which concerns all schemes of ventilation, whether they are based on natural or artificial motive agency, whether propulsion or extraction be adopted.

It is of very great importance that any fan or other motive agent which extracts or propels through a number of ducts to a number of points in the same apartment or building should extract or propel equally through all the ducts. This can be managed by a proper design of the ducts so as to give the sum of resistances of equal value in each instance.

Provision should be made for the cleansing of ducts. Neglect of this precaution has given the whole subject of ventilation a very low value in the estimation of medical men connected with English hospitals. Dirt naturally accumulates in ducts and undoubtedly vitiates in time to some degree the incoming fresh air. Not only so, but it also impedes the velocity of the current by increasing the friction of the ducts. For both these reasons, the internal surfaces of ducts should be constructed so as to keep clean as far as possible and to be readily cleansed when occasion requires, so that both efficiency and healthiness may be maintained.

We have already noted that as a general rule fresh air should be introduced at the lower part of the room. In Germany the contrary method is frequently adopted, and in some cases is advocated by English workers; but whatever advantages there may be in occasional instances, it is evident that the disadvantages are too palpable and certain for the downward method to be regarded as satisfactory. The argument that carbonic acid, and, therefore, foul air, is heavier than fresh air loses all its force when we remember that the weight of the carbonic acid does not prevent its rapid diffusion, and that foul air is almost invariably, by its warmth, lighter than fresh air.

OBITUARY.

MR. JOHN DANDO SEDDING, F.R.I.B.A.—We announce with very great regret the death of Mr. J. D. Sedding, F.R.I.B.A., which took place at Winsford Vicarage, Somerset, on Tuesday last, the 7th inst., after a few days' illness. Mr. Sedding will be remembered to many of our readers as the author of numerous papers read before professional and art societies—papers which are too numerous to mention; most of them will be found *in extenso* in the volumes of the *Builder*. We have elsewhere briefly spoken of his merits as an architect. Several of his designs and executed buildings have been illustrated in our pages. Among them we may mention the new Church of St. Edward, near Netley (see *Builder*, November 7, 1885); St. Dyfrig's Church, Cardiff (November 21, 1885); Reredos, Plympton St. Mary Church, Devon (September 4, 1886); Church of the Holy Redeemer, Clerkenwell (May 7, 1887); Reredos, Langport Church, Taunton (June 25, 1887); Brynmawr Vicarage (March 10, 1888); Holy Trinity Church, Upper Chelsea (October 6, 1888, October 12, 1889, and January 4, 1890); Church of St. Peter, Ealing (November 16, 1889); Industrial Schools, Knowle, Bristol (June 14, 1890); and Salcombe Church, Devon (December 13, 1890). Mr. Sedding was elected a Fellow of the Royal Institute of British Architects in 1874.

MR. J. H. STRUDWICK.—We have to record the death of Mr. James Hayward Strudwick, the well-known surveyor, which took place on Wednesday, the 1st inst., after an illness of more than two years. One who knew him writes:—"Mr. Strudwick was born in 1819, educated at the London University, and articled to the late Mr. William Hold, of Manchester-square, a well-known architect and surveyor in his day. Subsequently Mr. Strudwick was appointed by the late Sir Charles Barry assistant surveyor to the Houses of Parliament, and eventually to the entire control of the Surveyor's department. From this time a close and lasting friendship sprung up between that eminent architect and his family. On the completion of the Houses of Parliament, Mr. Strudwick commenced practice on his own account in Old Palace-yard. Some few years after Mr. Godfrey Walter Barry, son of the late Sir Charles Barry, joined him as partner, and so remained until his death. Mr. Strudwick throughout his professional career enjoyed a large and varied practice, and acted as surveyor for many of the most important architectural and engineering works of his day. Mr. Strudwick's justice and practical common-sense made him sought after as an arbitrator and expert witness, and for many years he was a well-known figure in the courts of law, and always a favourite amongst those with whom he came in contact. Mr. Strudwick leaves behind him an only son, who became his partner in 1881, and for some time has carried on the practice alone."

MR. DAVID MACKINTOSH.—The death is announced of Mr. David Mackintosh, architect, Oban, who died suddenly on the 2nd inst. a few yards from his residence in Strathaven-terrace, Oban. The deceased was partner at one time of the firm of Ross and Mackintosh, Inverness, but latterly he had carried on business in Oban on his own account. Among other buildings which he designed of late years were the County Buildings in Oban and St. Oran's Church at Connel Ferry.

MR. WILLIAM COATES.—The death recently took place of Mr. William Coates, who, after carrying on business in Bristol as a builder for nearly fifty years, has lately resided at Walton-by-Clevedon. He is stated to have helped liberally in the erection of various local Free Methodist Chapels, including those at Redland Grove, Horfield, and Bartonhill.

GENERAL BUILDING NEWS.

ALMSHOUSES, KING'S CLIFFE (NORTHAMPTONSHIRE). We are informed that a benevolent lady has decided to have erected a block of almshouses for six persons. Each will have sitting-room, with bed-recess and scullery. Local stone will be used both for walls and dressings. The covering will be of Collyweston stone slates. Wood-block floors and glazed brick fireplaces and skirtings will be provided. The block, to be known as "The Cornforth Homes," to be carried out from plans prepared by Mr. J. Boothroyd Corby, architect, Stamford. Mr. S. F. Halliday, of Stamford, is the builder.

THE LEEDS "SAFE DEPOSIT."—The Leeds Safe Deposit Company, Limited, opened the Leeds Safe Deposit on the 26th ult. It is the first establishment of its kind in Yorkshire; but Milner's Safe Company, who are stated to have erected all the "safe deposits" in the country, including the one at Leeds now under notice, are now engaged in constructing one for Huddersfield. The premises have been erected by Messrs. Gould & Stevenson, from plans prepared by Mr. William Bakewell, architect. Descending a flight of steps from the manager's office, the visitor is confronted by a pair of heavy gates which bar the entrance to the vaults, and here, isolated from all walls, resting on its own girders, and literally enclosed within a fire-proof cave, stands the ponderous structure known as the safe deposit. It measures 7 ft. 9 in. high, by 30 ft. long, by 23 ft. deep from front to back, and weighs upwards of 200 tons. In construction it consists of a combination of metals consisting of the toughest of wrought iron, intersected throughout with the hardest of undrillable steel, which claims the essential qualities of being absolutely unbreakable and impervious to the drill, or more ingenious devices of the modern burglar. The floor, sides, roof, front, and back are of great thickness, whilst the wide over-lapping joints, which are covered by powerful angle iron and butt bars, are said to render it impregnable. It has been bolted together from the inside, and upwards of 17,000 steel bolts were used in the process. This strong-room is subdivided into four separate sections, the first of which is fitted with 1,034 distinct safes of various sizes, ranging from 4½ in. in height, by 5½ in. in width, and 20 in. in depth, to 14 in. in height, by 11½ in. in width, and 20 in. in depth, the whole being fastened immovably together.

BATHS AND WASH-HOUSES, GREENHEAD.—On the 31st ult. a deputation from the Corporation of Stockton-on-Tees, consisting of Alderman Major Ainsworth and Mr. K. F. Campbell, C.E., Borough Surveyor, accompanied by Bailie Bowman, Mr. A. B. M'Donald, City Engineer; Mr. A. Mackay, Mr. Thomson, baths superintendent; and Mr. Thomas Murdoch, of Murdoch & Cameron, engineers, Glasgow, visited the Corporation baths and wash-houses, Glasgow. The Corporation of Stockton-on-Tees are now erecting new baths and wash-houses on an extensive scale, and the object of the deputation was to inspect the arrangements of the baths and wash-houses of Glasgow. The chief purpose of the inspection was to see some of the work done by Messrs. Murdoch & Cameron, who lately remodelled and reconstructed the Greenhead washing-houses. The party left the City Chambers about 11 am., and drove direct to Cranstonhill Baths, and thence to Gorbals, with both of which establishments the deputation were highly pleased. Afterwards they visited Greenhead Baths, and expressed their great satisfaction with the wash-houses in that establishment, especially with Messrs. Murdoch & Cameron's method for taking away steam from the washing tubs and boiling tubs. The deputation are stated by a Glasgow paper to have been so well pleased with that firm's engineering work as shown in these baths that before leaving Glasgow they placed the contract for the Stockton-on-Tees baths and wash-houses in their hands.

MEMORIAL CHAPEL, EAST KESWICK.—The new Wesleyan Chapel at East Keswick, erected as a memorial to the late Mr. Joseph Laurence, was opened for public worship on Easter Monday. The chapel is in the Decorated Gothic style of architecture. It is 50 ft. long and 29 ft. wide, capable of accommodating 200 persons on the ground floor, and has a gallery at the west end over the entrance lobbies for fifty scholars. The front consists of a central gable, with an octagonal spirelet at the north-west angle rising to a height of 52 ft. The centre doorway terminates in a gable, having windows on either side to light the lobbies, and there is also a four-light traceried window. The inner lobbies give access to the aisles and to the staircase leading to the gallery. The communion-table is in an arched recess at the east end of the chapel, and over it is a circular traceried window filled with stained glass. The school-room at the rear accommodates seventy scholars. The building is of stone, with the walls lined with brick. The internal woodwork that can be seen is of pitch-pine, varnished; the remaining woodwork is of red deal. Special attention, it is said, has been given to the warming and ventilation. The cost of the building has been upwards of 1,500*l*. Mr. George F. Danby, of Leeds, was the architect, and the contractor for the work was Mr. Robert Brelsford, East Keswick.

NEW FREE CHURCH FOR PAISLEY.—On the 28th ult. the memorial-stone of the new Free Church being erected at Greenlaw, Glasgow-road, Paisley, was formally laid by Mrs. William M'Kean. The style of architecture is Gothic, of the Perpendicular type, and the church is being constructed of red sandstone. The extreme length within walls is 74 ft. by 52 ft., having a recess in front over the vestibule, with one at the north end behind the pulpit. Entrance is obtained through a doorway in the centre of the south front, which leads into a vestibule. A gallery extends round three sides of the church, with a recess behind the south gable; and the roof, which has timbered principals, with mouldings, arched ribs, and foliated cages, rises to a height of 55 ft. above the level of the floor. A square tower 120 ft. high, with pinnacles and octagonal spire, will be situated at the south-east corner. At the corresponding corner an octagonal turret is also being erected. In the centre of the south gable is a traceried and cusped window, having eight vertical lights, divided by moulded mullions and transomes with arched heads. The side fronts have gablets, forming eastern and western transepts, with two lancet and rose windows in each. The area of the church has two-light, and the gallery three-light side windows, whilst the chancel or organ recess is lighted by single windows in the side, and a three-light window in the back. To the back of the church, the hall, the vestry, and the session-house have been placed. It is expected that the total cost will be 4,300*l*. Mr. James Donald, Paisley, is the architect.

THE NEW MISSION CHAPEL AT GLYNTARRELL (Saint Illtyd), near Brecon, which was opened this week by the Lord Bishop of St. Davids, is a small edifice of strictly church character. The length is 51 ft., and the width 19 ft. 6 in. The style of architecture is of the simple lancet character, similar to what prevailed in the early part of the thirteenth century. The chapel is built of the fine hard local stone, without any mixture of Bath or soft stone. The nave is lighted by two two-light windows on either side, and a lancet in the west end. The chancel has two lancets on each side and three in the east end. The entrance is on the south side, near the west end. A small vestry is formed by means of a low screen. The nave is fitted with chairs on floors of wood blocks. The altar-table, choir seats, prayer-desk, chancel-screen, and pulpit are all of oak. There is an oak altar-rail on iron standards. The font is placed near the entrance at the west end of the church. There is a sedilia and

piscina in the sacrarium, and a reredos of stone under the centre light of the chancel. The floor of the chancel and of the centre passage of the nave are of tiles from Messrs. Godwin & Son, Lugwardine. The roof is open-timbered, and covered with green slates. Mr. F. R. Kempson, of Llandaff, is the architect.

Schools, Cardiff.—On Monday, the 6th inst., the Bishop of Llandaff opened the new schools of St. Mary, Cardiff. The schools, which are situate at the corner of North Church-street, have been erected from the designs of Mr. Fred. J. Veall, architect, Cardiff. They afford accommodation for 146 girls and 144 infants, and are said to be in strict accordance with the requirements of the Education Department. The buildings have been carried out by Mr. John Haines, of Cardiff, at a cost, including cooking kitchen and extra foundations, of about 1,770*l.*

New Church, Chadsmoor, Staffordshire.—The foundation stones of St. Chad's Church, Chadsmoor, were recently laid by Lord Hatherton and Mrs. Bumstead. The church is designed to accommodate 300 worshippers, and will cost 2,500*l.* The style will be simple Gothic, of the early English period. Mr. Samuel Loxton, of Walsall, is the architect, and Mr. Robert Barton, of Hednesford, the contractor.

Mission Hall, Plymouth.—On the 25th ult. the foundation-stone of a new mission hall, in Grenville-road, St. Jude, Plymouth, was laid by Dr. C. A. Hingston. The principal entrance of the new building will occupy the centre of the south front, and will face Grenville-road. The hall will provide accommodation for some 300 persons. Its height will be 12 ft. 6 in. to the springing of the roof, and 18 ft. 6 in. to the ceiling, which will be of varnished wood. The platform will occupy the north end of the hall, and there will be an ante-room adjoining. There will be class-rooms and other adjuncts towards the north. The walls will be faced with limestone, and there will be red brick dressings to windows and doors. The architect is Mr. James Henry Keats, of Plymouth, and the contractors are Messrs. C. H. Tozer & Son, also of Plymouth.

Wesleyan Chapel, Heswall, Cheshire.—On the 30th ult. the corner-stones were laid of a new chapel, which is being erected at Heswall by the Wesleyan denomination. The site of the new building fronts Telegraph-road, and contains 1,800 square yards, leaving space for future extension and school-buildings. The chapel will have seating accommodation for 325 in nave, transepts, and chancel; minister's vestry, &c., being provided at the rear. The building will be faced with local red sandstone. The windows will have traceried heads, filled with tinted cathedral lead-lights. The contract is being carried out by Mr. John Shaw, of Birkenhead, for about 1,300*l.*, from designs furnished by Mr. Thomas W. Cubbon, architect, Birkenhead, who is also superintending the work.

New School Chapel, Hebburn, Durham.—The ceremony of laying the foundation and memorial stones of a new school-chapel for the Wesleyan Methodist community of Hebburn took place on the 25th ult. The site, which is situated in Argyle-street, will admit of a future extension of the buildings about to be erected. The cost of the building, inclusive of the site, will be about 1,000*l.*, and it will accommodate about 250 persons. In addition to the school-chapel, there will be two class-rooms. The buildings are being constructed of red bricks with stone facings. Messrs. T. A. Page & Son, of South Shields, are the architects.

Presbyterian Church, Newtownbreda, Belfast.—The foundation-stones of a new Presbyterian Church at Newtownbreda were laid on the 4th inst. The building occupies a position at the junction of the Ormeau and Knockbreda roads. The style of architecture is of the Early English period. The walls are being built of Scrabo stone, with red cut stone dressings. The plan is cruciform in shape, the internal columns of cut stone, with their moulded caps, from which spring the arcade arches, divide the nave and side aisles. The transept and chancel arches are also of stone. Above the level of the side aisles there will be a row of clear-story windows. In the front there are two entrances, facing the Ormeau-road. There will be an entrance also in the north side from Knockbreda-road. The buildings at the rear comprise a session-room, space for organ bellows and meter; also a ladies' room, heating apparatus, and lavatory. Accommodation will be provided for 500 on the ground-floor of the church, sixty in the gallery, and forty in the choir. The woodwork generally, including the seats, wainscoting, and gallery front, will be of selected pitch-pine, polished. The ceiling will be sheeted with pitch-pine, and the constructional timbers will be exposed to view. Special care, it is stated, has been devoted to the heating, lighting, and ventilating. The works are being carried out by Mr. Robert Corry, builder, Belfast, from the designs and under the superintendence of Mr. Vincent Craig, architect, Belfast.

Restoration of St. Peter's Church, Droitwich.—This church, which has been closed for several months for restoration, was reopened on the 1st inst. The alterations comprise the reroofing of the north and south transepts, chancel, and porch, enlargement of the vestry, new lights to the window of the north transept, and a new window to the porch. The floor has been lowered a foot, and laid with wood blocks under the seats, while the aisles and chancel have been paved with encaustic tiles. New stone steps have also been added to the chancel. The church has been reseated. The wall over the Norman arch has been pierced with triplet arches in character with the main arch. The work has been carried out by Mr. A. Stokes, of Droitwich, from designs by Mr. Lewis Sheppard, of Worcester. The cost of the work has been £900.

English Presbyterian Church, Llandudno.—Referring to our notice of this church last week (p. 276, *ante*), we are asked to mention that the floors have been laid with Lowe's patent pitch-pine wood block flooring.

STAINED GLASS AND DECORATION.

Windows, St. Lawrence's Church, Tidmarsh.—Three stained glass windows have recently been placed in the west end of St. Lawrence's Church, Tidmarsh, West Reading, in memory of the late Mrs. Morgan, wife of the rector of the parish. The figure subjects represent different scenes in the early life of our Saviour. The centre window shows the child Jesus working in the carpenter's shop, with the Blessed Mother and Joseph in the background; whilst the other windows represent, one, the flight into Egypt, and the other the finding of Christ in the Temple by the Virgin Mother. The work was carried out by Messrs. Childs & Son, of Reading.

Memorial Windows at Christ Church, Jarrow.—On the 29th ult. three stained-glass windows were unveiled in the chancel of Christ Church, Jarrow. They have been placed there by Lord Northbourne, in commemoration of his wife, and have been designed by Mr. Kemp, of London. The window at the east end consists of three lights, and is a representation of the Virgin Mary in the centre position, and Mary and Martha respectively to the left and right. The second consists of a group of figures, representing Hannah and Samuel and Sarah and Isaac; and the third, the figures of Anna and Tabitha.

Stained-glass Window at Taunton.—At the ancient parish church of Taunton St. James a stained-glass window has just been added. It consists of three lights. The figures in the window are surmounted with tabernacle work, and underneath are angels bearing scrolls. The window was designed by Mr. Swayne Bourne, of Birmingham, and it was fixed by Mr. H. J. Spiller, of Taunton.

FOREIGN AND COLONIAL.

France.—The Académie des Beaux-Arts last Saturday elected M. J. P. Laurens to replace Meissonier in the section of painting. At the final "scrutin" he obtained eighteen votes, against seventeen for M. Lefebvre and one for M. Detaille.——MM. Gérôme and Bouguereau are to go shortly to St. Petersburg, where the Russian fraternity of painters are preparing a cordial reception for them.——M. Alpband has been appointed to represent France at the Chicago exhibition.——M. Eugène Meyer, architect, of Paris, has obtained the first premium in the competition for a new school at Lucerne.——M. Paul Dubois, Directeur de l'École des Beaux-Arts, is to go to Rome to inquire, on behalf of the Minister of Public Instruction, into the reforms necessary at the French school at the Villa Medici.——The Jury of the Champs de Mars *Salon* has selected 1,710 pictures for admission; 1,800 was to be the limit.——M. Gagliardini, the landscape painter, has collected an exhibition of his works at the Georges Petit Gallery, which will be open till the 17th. There is also an exhibition of the landscape paintings of M. Gustave Garaud at the Cercle Artistique, Rue Volney, open till the 20th; and at the Cercle de la Libraire there has been opened the first exhibition of the "Société des Artistes Graveurs au Burin."——The Municipal Council has decided on the reconstruction of the Caserne des Celestins near the boulevard St. Germain, according to the plans of M. Jacques Hermant, selected in a competition last year. The work will cost 4,500,000 fr., towards which the Council has voted an instalment of 624,000 fr.——The death is announced of M. Seurat, a clever impressionist artist and member of the Society of "Artistes Indépendants," at the age of thirty-one; also of M. Davrillé des Essarts, architect, Inspecteur des Travaux to the Cour d'Appel of Paris.—— M. Yves Guyot, Ministre des Travaux Publics, has gone to open the new railway of the Orleans Company, to connect Châtellerault with Tournon St. Martin (Indre).——The museum at Versailles has received a portrait of M. Rameau painted by Baudran. Rameau was a descendant of the eminent musician of that name, and was Mayor of Versailles in 1870.——A statue of Theodore de Banville, the poet, is to be erected at his native town of Moulins.——The new railway from Troyes to St. Florentin is to be opened shortly.——The Société Académique d'Architecture of Lyons has, according to its annual custom, opened a competition for 1891, between French and Foreign architects. The same society has also set on foot an annual competition for French and foreign architects, with the view of obtaining the best records of all monuments in the Department of the Rhone which are threatened with destruction either from age, neglect, or alterations of public roads and streets. Information with regard to this may be obtained from the secretary of the Société Académique d'Architecture, at the Palais St. Pierre at Lyons. The Direction des Musées Nationaux is about to provide at the Luxembourg a section of engraving. As the present accommodation is limited, it is expected that a new gallery will be formed for the purpose, on the site of the garden of the palace occupied by the President of the Senate and known as the "petit Luxembourg."——There is to be opened next month at the Champ de Mars an original kind of exhibition, consisting of specimens of all the "Journeaux de Mode," as well as all kinds of advertisement designs, &c.——It is announced that the workmen engaged in excavations on a property situated at Aubagne, near Marseilles, have discovered the remains of a Roman monument in good preservation, and having some resemblance to the Maison Carrée at Nimes. The fragments of sculpture found lead to the belief that it was a temple to Diana. ——M. Vaudremer, President of the Organising Committee of the Salon, has taken steps to provide that architectural designs should be included in the illustrated catalogue of the Salon, which has hitherto only included painting and sculpture.——M. Achille Hermant, architect, has been commissioned by the Minister of Public Instruction to undertake an inquiry into the legal conditions under which the profession of architecture is practised in Italy, whether it is under any restrictions or whether entirely free.——The Société des Architectes de la Seine Inférieure has applied for powers to adopt a series of measures for the sanitary improvement of Rouen.

Wittenberg. The old "Schlosskirche" (built 1499), from the historical point of view one of the best-known churches in Germany, on account of the Reformer Luther having nailed the scroll with his proclamation and 95 theses to the church door, is to have a thorough restoration, to be carried out under the direction of Professor F. Adler, of Berlin. The restoration had already been commenced, by order of the deceased Emperor Frederick III., but had not been continued after his death. The present Emperor has now shown interest in the matter, and wishes the restoration to be complete by 1893.

MISCELLANEOUS.

Water-Motor.—We have received from Mr. Pitman, of Withington, Manchester, diagrams of what he calls) "the demon water-motor," which in spite of its rather absurd and grandiloquent name, appears to be a simple and useful water-motor for light work. It consists of a circular flat-iron disc, on each side of the rim of which are a series of equally spaced cups or thimbles, their length parallel to the periphery of the wheel, driven by a twin jet fixed over the front or descending side of the wheel, pouring water into the cups. The latter are arranged in alternative positions, those on one side of the rim occupying a position corresponding to the inter-spaces on the side, so as to assist in securing a steady and uniform motion.

Furnace Bars.—Messrs. Clarke & Co., of Nottingham, send us a description and illustrations of their perforated and reticulated furnace bars, which, as put together, form a series of vertical tubes under the furnace, narrowing upwards so as to allow a free ingress of air from below while preventing coal from slipping through before it is thoroughly burned. In fact it combines quick draught with a practically close bottom for the coal to rest on, instead of the wide parallel spaces left by ordinary bars.

Coloured Photographs.—At a recent sitting of the Académie des Sciences, Paris, one of its members, Professor Lippmann, explained a new physical method of reproducing the colours of the solar spectrum in the photographic way. Lippmann's process is very simple. Any film employed in photography may be used for it, providing that the sensitive substance is permanently present in it. Those emulsions in which this substance is distributed in the form of fine grains cannot be employed for the purpose. Lippmann used in his experiments bromegelatine plates. The chief feature of the process is that there is under the sensitive film a metallic layer in Lippmann's method a thin layer of quicksilver—which reflects the rays of light. The further development of the photograph is proceeded with in the usual way. The theory of Lippmann's process is described by him as follows: —The light entering through the objective passes without sensible deflection through the sensitive film of the plate, and effects, with the light reflected from the metallic layer, the division of the film into extremely fine waves, each of which has the exact thickness required for producing the corresponding colour. The vibrations of light are consequently fixed and reproduced almost in the same way as the sound waves in the phonograph. Professor Lippmann submitted to the Academy the results of his experiments in various plates and prints, in which the colours were completely fixed, without being subject to change by the action of light or air.—*Times.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Additional Wards, &c. at Dispensary Bury	Board of Management	20l. 10l. 5l.	May 1
Water Supply to Town	Rugeley Local Board	50 Guineas	do.
*Public Hall and Offices, Earlestown	Newton-in-Mackerfield Commissioners	50l. 25l. and 15l.	May 23
Odd Fellows Hall, Stafford	Committee	15l.	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Making-up Carriageways and Paving Footways	Willesden Local Board	O. Claude Robson	April 14
*Pipe Sewers, &c.	do.	do.	do.
*Repairs to Roads	Borough of Croydon	*Official*	do.
*Broken Granite and Flints	Corporation of Kingston-on-Thames	do.	do.
Fifty Houses, Argoed, Blackwood, Mon	Birbwy valley Land & Cottage Co. Lim.	W. L. Griffiths	do.
Re-building "Three Horse Shoes" Inn, Ramsey, Hunts	E. V. Sewell	Jas. Ruddle	do.
Whinstone Macadam (400 tons)	South Bivth Local Bd.	*Official*	do.
New Building and Works, Manchester	L. & N. W. Ry.	do.	April 15
Ten Cottages, Cliffew, Neath	Cilfrew Tinplate Wks.	do.	do.
Pennaeninawr Road Stone	Winsford Local Board	*Official*	do.
Hotel, Pelmerstown, near Cadoxton-juxta-Barry	.....	Bruton & Williams	do.
Congregational Chapel, Rhos, Newport, Mon.	Rev. Jacob Williams	Alfred Swash	do.
Wrought-iron Tubes, Stand Pipes, &c.	Leeds Gas Works	Mr. Lupton	do.
Restoration of Church, Llanllawgel, Rhyd-thun, Radnor	.....	S. W. Williams	do.
Kerbing, Flagging, Pitching, &c.	Bollington Local Bd.	*Official*	do.
Disinfecting Chamber, &c.	Darlington Hosp. Com.	do.	April 16
New Co-operative Stores, West Haddon	The Manager	.....	do.
Alteration and Renovation of Chapel, Wombwell, near Barnsley	.....	Thos. Howdill	do.
*Dock Gates (Wrought-iron and Steel)	North Eastern Railway	J. W. Barry	do.
Timber and other Supplies	Sunderland Corp.	*Official*	do.
Road Metal (1,000 tons)	Penarth Local Board	Jas. Court	do.
Repairs of highways	do.	do.	do.
Several Houses, Roads, and Drains, Barrow, Cumb.	Bargoed Building Co. Lim.	W. L. Griffiths	do.
School Buildings, St. Mellion, Cornwall	F. G. May	.....	do.
Independent Sunday School, Wheatley, Halifax	.....	Jas Farrar	do.
*Painting Works	M. R. Co.	*Official*	do.
*Steam Roller	Buxton Local Board	J. Hague	do.
Five Dwelling-houses, Stainciffe, Leeds	.....	Walter Crawshaw	April 17
Arcade, Swansea	Swansea Arcade Co. Lim.	J. Buckley Wilson	April 18
Re-building St Mary's Church, Briton Ferry	The Vicar	.....	do.
*York and Tar Paving, Kerbing, &c.	Meudon Local Board	S. S. Grinsley	April 20
*Four Miles of Cast-iron Socket Pipes	Coventry Waterworks	T. & C. Hawksley	do.
Alterations and Additions to Fire Brigade Station &c.	Southampton Corp.	W. B. G. Bennett	do.
Flint Road Metal	Guildford U.S.A.	Henry Peak	do.
*Supply and Fixing High Pressure Boilers	Paddington P. B. & W. Comms.	*Official*	do.
*Paving Works	Camberwell Vestry	do.	do.
*Ballast, Sand and Cement	Paddington Vestry	do.	do.
*Wood Blocks for Paving	do.	do.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*York Stone and Masons' Work	Bermondsey Vestry	*Official*	April 20
Convent National School, Arklow	The Manager	.....	do.
*Removing Mound, &c. Portsmouth	War Department	*Official*	April 21
*Kerbing, Tarpaving, Metalling, and Chanelling Work	Lewisham Bd. of Wks	do.	do.
*Pulling down Buildings	Holborn Union	H. Saxon Snell	do.
Four Purifiers	Osett (Leeds) Gas Co.	*Official*	April 22
*Compensation Reservoir	Nelson Corporation	J. Newton & Son	do.
*Cast-iron Lamp Posts	Hackney Bd. of Works	J. Lovegrove	do.
*Re-construction of Drainage and Sanitary Fittings	Kensington Guardians	J. W. Aldwinckle	April 23
Alterations and Additions to St. Peter's Church, and Enlarging Schools and Caretaker's House, Cardiff	Rev. D. D. Jones	E. M. Bruce-Vaughan	do.
*Pavil on at Swansea	National Eisteddfod of Wales	E. Bath	April 24
Extension of the "Rest," Porthcawl, Glam	The Committee	G. F. Lambert	April 25
Farm Buildings and Cottages, Lancast, Barton, Launceston	Thos. Ffrench	W. T. Martyn Mear	do.
Pavilion	Rhyl Pier and Pav. Co	Darbyshire & Smith	April 26
*Public Baths and Washhouses	St. Giles (Camberwell) Vestry	Spalding & Cross	April 27
*Broken Granite	City of London Union	*Official*	do.
*Carriage and Footways, Drainage, and other Works	London CountyCouncil	do.	April 28
*Sewers, &c. Works	West Ham Council	Lewis Angell	do.
*Pumping Machinery, Engine and Boiler Houses, &c.	Brighton Council	*Official*	do.
*Enlargement of P. O. at Liverpool	Com. of H.M. Wks, &c	do.	do.
*General Works, Extending Goods' Warehouse and Offices	N. E. Ry. Co.	W. Bell	April 29
*Boiler, Engine, Pumps, &c. for Waterwks	West Cowes Local Bd.	W. Brown	May 2
*Engine and Boiler House, &c. (Waterwks)	Taunton Corporation Waterworks	*Official*	May 4
*Storage Reservoir	Knutsford Guardians	do.	No date
Doorways, Iron Staircases	.....	Thos. D. Barry	do.
New Chancel, Vestries, St Michael's Church, Runcorn	.....	Mrs. Thomas	do.
Additions to Glandwr, Boulter-down, Cardiff	Addison, Potter, & Sons	Veall & Sant	do.
Malting, Newcastle-on-Tyne	.....	Thompson & Dunn	do.
*Morley House Convalescent Home—New Wing and Offices	.....	G. D. Stevenson	do.
New Church, Brechis, near Carmarthen	.....	E. H. Lingen Barker	do.
House, Rusty-grove, Peterboro'	M. Hall	.....	do.
Alteration and Enlargement of Moorfield House, Headingly, Leeds	J. C. Nicholson	Thos. Ambler	do.
Wesleyan Schools, Cinderford	.....	John Wills	do.
Alterations and Additions to Parsonage House, Ludlow	Rev. A. Bannister	.....	do.
Medical Hall, Builth	Mr. Thomas	.....	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Sanitary Inspector	Westminster Vestry	120l.	April 15
*Clerk of Works	Hornsey Local Board	3l. weekly	April 18
*Assistant Surveyor	Coventry Council	200l.	April 27
*Clerk to City Surveyor	do.	100l.	do.

Those marked with an Asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, vi, and viii. Public Appointments, p. xviii.

ROBERT BOYLE & SON (LIMITED).—We are informed that the directors of Robert Boyle & Son (Limited), ventilating engineers, London and Glasgow, have resolved to pay an instalment on account of dividend at the rate of 12 per cent. per annum for the half-year ending March 31 last. Messrs. Boyle, we understand, have on hand some very important ventilating contracts in this country and abroad, especially in South Africa, where Mr. Robert Boyle, the managing director, is at present. The air-pump ventilator is being adopted for the ventilation of, amongst other buildings, the House of Parliament, the Castle, Town-hall, New Somerset Hospital, and New barracks, Cape Town; the New Municipal Buildings, Town-hall, Club-house, and Hospital, Kimberley; Stock Exchange, Pavilion, and Club-house, Johannesburg; new House of Parliament, Bloemfontein; new Municipal Buildings and Town-hall, Durban; and St. Andrew College and The Asylum, Algoa Bay.

"A BOOK OF HOUSES."—Mr. Ernest Newton, referring to our recent notice of his "Book of Houses," writes to say that the apparent smallness of the rooms in some of them which we pointed out, is owing to the incorrectness of the scales through an oversight in making the reductions. He has now arranged that the correct scales shall be given in all future copies, and any purchaser may have the corrections sent to him on application to his publisher, Mr. Batsford.

THE ENGLISH IRON TRADE.—The English iron market is still very quiet, and its tone rather weak; in fact, the depression and weakness are greater than when we reported last week. There is no speculative buying whatever, the only sales effected being for immediate requirements, and of the smallest possible quantities. The belief is gaining ground that the bottom has not yet been reached, and that we may witness a similar state of things as existed in 1887. The unfavourable nature of the Board of Trade Returns for March, showing a formidable deficiency in our foreign trade, also does not tend towards restoring confidence. The condition of the pig-iron market is flat in the extreme, and has not been improved by the issue of the Cleveland ironmasters' returns, which, to say the least, are disappointing, and may have had something to do with depressing Middlesbrough pig is. a ton. On the other hand, the stores of pig-iron in Scotland continue to be drawn upon, and although some descriptions of Scotch makers' iron are 6d. cheaper, most of the leading brands are scarce, and the least revival in the demand would send them up again. In the hematite trade, also, it is thought that prices will be lower than they are; at any rate, some makers are asking 1s. less. The finished iron trade continues quiet, but there are a few more inquiries here and there, which, however, does not prevent prices becoming weaker. Common bars are 2s. 6d. lower. The general state of the steel market is not encouraging, and quotations are easier. Most descriptions of steel have gone back in value 2s. 6d. a ton. Shipbuilders are quiet as regards new business, but doing a fair amount of work. Engineers also are fairly well employed, while new work is falling off. —*Iron.*

SUTTON-IN-ASHFIELD WATERWORKS.—Mr. George Jennings, of Stangate, Lambeth, has received an order for fixing the electro-mechanical apparatus for indicating and recording in the pumping-station the level of the water in the reservoir, for the Sutton-in-Ashfield Local Board. Mr. George Hodson, F.G.S., of Loughborough, is the engineer. This apparatus was described and illustrated in the *Builder* for September 17, 1887.

MEETINGS.

SATURDAY, APRIL 11.

Architectural Association.—Visit to the Church of St. John the Baptist, Holland-road, Kensington. 3 p.m.

Royal Institution.—Professor Silvanus P. Thompson on "The Dynamo." I. 3 p.m.

MONDAY, APRIL 13.

Society of Arts (Cantor Lectures).—Mr. Hugh Stannus on "The Decorative Treatment of Natural Foliage." I. 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. F. Tiffany on "Mahogany and other Fancy Woods used for Constructive and Decorative Purposes." 7.30 p.m.

TUESDAY, APRIL 14.

Institution of Civil Engineers.—Discussion on Mr. R. E. B. Crompton's paper on "The Cost of the Generation and Distribution of Electrical Energy." 8 p.m.

Society of Arts (Applied Art Section).—Mr. G. T. Robinson, F.S.A., on "Decorative Plaster Work: Stucco Work." 8 p.m.

WEDNESDAY, APRIL 15.

Civil and Mechanical Engineers' Society. Mr. J. C. Butterfield on "Explosives, with Experiments." 7 p.m.

British Archæological Association.—Mr. W. T. Brossington, on "The Ancient Library of Gloucester Cathedral." 8 p.m.

Society of Arts.—Mr. W. Topley, on "The Sources of Petroleum and Natural Gas." 8 p.m.

THURSDAY, APRIL 16

Society for the Encouragement of the Fine Arts.—Second *Conversazione.*

Institution of Civil Engineers.—Students' visit to the works of the Great Northern Railway, between King's-cross and Holloway.

Institution of Electrical Engineers.—8 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, APRIL 17.

Royal Institution.—Professor A. W. Rücker, on "Magnetic Rocks." 9 p.m.

SATURDAY, APRIL 18.

Royal Institution.—Professor Silvanus P. Thompson on "The Dynamo." II. 3 p.m.

Edinburgh Architectural Association. — Visit to Fountainhall, Pencaitland Church, and Winton Castle.

Glasgow Architectural Association.—Visit to Largs.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

4,662.—BEVELLING SQUARE: *J. P. Bayley.*—This invention relates to an instrument enabling angular measurements to be made at both sides and both ends of the square. A longitudinally-slotted plate has attached at each end a square consisting of two arms at right angles—one bevelled, the other provided with a threaded stem or stud adjustable in the slot of plate by thumb nuts, the same by which the squares are clamped to the slotted plate.

6,147.—GLAZING: *A. Montrose.*—According to this invention, a T-shaped astragal is used, with corrugated metal supports, and a single piece or two strips of lead or soft metal serves as a cap for the sheets of glass.

6,265.—DOOR CLOSER: *C. J. Orr.*—The patentee employs a weight for closing the doors, and this weight is arranged, by suitable mechanism, to act in a very similar way to the hydraulic or pneumatic closers.

15,786.—PAINTS: *W. A. Hall.*—The paints which are the subject of this patent are dry or water paints, the dry ones being composed of silicates and chemicals mixed in suitable proportions, and adapted to be applied as a surface covering in a liquid state after the manner of paint by the addition of water. A second form is also produced in the form of a powder, but is used with hot water; while a third is in a liquid form, combining the chemicals and colouring pigments held in solution.

17,668.—SASH PULLEYS: *J Clarkson.*—Instead of the ordinary rectangular face to which the pulley is attached, and which requires to be mortised into the pulley-stile by the chisel, the face is according to this invention formed in such a manner that it is sunk in the desired position by a single rotary cutting-tool, thereby saving time and labour.

20,862.—SLIDING-DOORS, &c.: *J. Newall and another.*—The apparatus which is the subject of this patent consists of an oblong box, one end projecting a quarter of an inch over each side, with a space in the centre to admit a solid revolving roller working on an axle shaped as a three-sided oblong. This axle is supported by a strong coil spring, the spring at one end being rivetted to the bottom of the box. The axle works between two pivots on each side of the box. These act as two slides to keep the axle and roller in its proper position.

NEW APPLICATIONS FOR PATENTS.

March 28.—5,137, G. Bray, Ventilation.—5,149, J. Bingall, Champer Plane.—5,157, H. Marten, Stands for Paper-hangings, Pattern-books.—5,166, S. Pitt, Raising and Lowering Sliding Frames, &c.

March 24.—5,193.—D. Noble, Washing or Cleansing Walls, Ceilings, &c.—5,195, A. Page and G. Way, Prevention of Down-draught in Chimneys.—5,200, W. Burr, Stop-cock twin Water-waste Preventing Cistern.—5,203

Hughes, Sash-spring Coil and Axle Pulley.—5,224, L. ndorph, Metallic Facing for Buildings.—5,227, A. n, Opening or Shutting Skylights, Windows, &c.— , A. Prentice, Window Sashes and Frames, &c.— , S. Miller & Others, Flush-tanks.—5,273, J. er, Closing or Retaining Doors, &c.

rch 25.—5,309, H. Bruck, Imitation Marble.—5,331, oldsmith, Chimney Cowls.

rch 26. 5,363, D. Nicoll, Slabs for Road-making.— R. Jesson and others, Brick Moulds, &c.—5,372, hillipson, Water-closet.—5,389, J. Shone, Ventila- of Drains and Sewers.—5,392, F. Marwood, Window ener.—5,423, T. Smith, Sash Fastener.—5,424, J. am, Construction of Fireproof Staircases, Floors,

rch 28.—5,463, J. Kulsage, Brick-making Machines. 83. H. Nemity, Mural and other Decorations.— W. Horn, Wall and Ceiling Polish.

PROVISIONAL SPECIFICATIONS ACCEPTED.

54, W. Ingram, Spirit Levels.—2,749, J. Young, &c.—2,923, R. Crane, Floor-warming Radiators oils.—2,595, W. Holbrook, Draught-preventer for s and Casements.—3,384, W. Bendall, Paint Cans or —4,408, S. Chitty and B. Williams, Stay or Fas- r for Casements, &c.—4,484, J. Townshend, Folding ollapsible Seats.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

03, J. Smeaton, Flushing and Waste-preventing ratus for Water-closets, &c.—6,895, W. Thompson, ts, &c.—8,412, G. Strawson, sen., and G. Strawson, Attaching Glass to Greenhouses, &c.—8,413, J. nell, Artificial Stone.—18,818, A. Steele, Stoves or grates.—3,309, W. Moore, Water-closets.

OME RECENT SALES OF PROPERTY :

ESTATE EXCHANGE REPORT.

RIL 2.—By *Newbon & Co* : 7, Sheep-lane, Hackney, u.t. s., g.r. 4*l.* 5*s.*, r. 32*l.* 10*s.*, 185*l.* ; 58, Wellington-rd., shury, u.t. 52 yrs., g.r. 6*l.*, r. 30*l.*, 157*l.* ; 35, Ovington- Chelsea, u.t. 40 yrs., g.r. 12*l.*, r. 46*l.*, 61*0l.* ; 4 and 6, nge-pl., u.t. 17½ yrs., g.r. 6*l.* 6*s.*, r. 62*l.* 8*s.*, 360*l.* ; 8, tbourne-st., u.t. 30 yrs., g.r. 6*l.*, r. 45*l.*, 460*l.* ; 11, 13, 15, Hale-st., Islington, u.t. 36 yrs., g.r. 15*l.* 15*s.*, r. 88*l.* ; 6, Myddelton-sq., Pentonville, u.t. 21 yrs., 5*l.* 1*s.* 4*d.*, r. 60*l.*, 415*l.*

RIL 3.—By *D. J. Chattell* : A plot of land, cote-street, Stockwell, u.t. 76 yrs., at a pepper- , 550*l.*

ontractions used in these lists.—F.g.r. for freehold und-rent ; l.g.r. for leasehold ground-rent ; i.g.r. for oved ground-rent ; g.r. for ground-rent ; r. for rent ; freehold ; c. for copyhold ; l. for leasehold ; e.r. stimated rental ; u.t. for unexpired term ; p.a. for nnum ; yrs. for years ; st. for street ; rd. for road ; or square ; pl. for place ; ter. for terrace ; cres. for cent ; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS

TIMBER.		TIMBER *(continued)*.	
heart, B.G.		Satin, St.	
ton	6.10/0 7.15/0	mingo .....ft.	0/0/10 0/1/3
E.I. load	8.10/0 14/0/0	Porto Rico	0/0/9 0/1/6
ia, U.S.ft.cu.	2/3 3/0	Walnut, Italian	0/0/3½ 0/0/7
Canada load	2/0/0 4/5/0	METALS	
do.	2.5/0 4/5/0	Iron Bar, Welsh,	
do.	2.10/0 4.15/0	in London..ton	6.5/0 6/15/0
Dantzic, &c.	2/0/0 3/15/0	Do. do. at works	
do.	2/10/0 4/10/0	in Wales	5/15/0 6/5/0
nda	4.17/6 6.10/0	Do. Staffordshire,	
Canada red	2/10/0 3.10/0	in London	6.5/0 7/0/0
yellow	2/0/0 5/10/0	COPPER—British,	
Drantzfath	5/0/0 6/0/0	cake and ingot	56/0/0 57/0/0
Petersburg	5.0/0 7.0/0	Best selected ..	59/0/0 60/0/0
Finland,		Sheets, strong	70/0/0 72/0/0
8 1st sl.100	7.0/0 10.0/0	Chili, bars	52.10/0 0/0/0
4th & 3rd ..	7/0/0 8/0/0	YELLOW METAL	0/0/6 0/0/6½
Riga	6/0/0 7.10/0	LEAD — Pig,	
Petersburg,		Spanish ....ton	12/12/6 0/0/0
st yellow ..	9/10/0 14.0/0	English, com.	
2nd yellow	8/0/0 9.0/0	Middle	12/12/6 12/15/0
white	6.10/0 10.0/0	Sheet, English,	
olish	6/10/0 7.0/0	3 lbs. per sq. ft.	
te Sea	8.0/0 10.10/0	and upwards ..	14/0/0 0/0/0
via Pyrolat	7.0/0 7.10/0	Pipe	14.10/0 0/0/0
do. 2nd ..	9.0/0 15/10/0	ZINC — English	
do. 3rd, &c.	6.10/0 10.0/0	sheet	26/10/0 0/0/0
Spruce, 1st	8.10/0 10.10/0	Vieille Mon-	
do. 3rd &		tagne	27/0/0 0/0/0
nd	6/0/0 7/10/0	TIN—Straits	90.10/0 0/0/0
e Brunswick	5.0/0 7/0/0	Australian	80/15/0 0/0/0
ons, all sizes	8.10/0 15.10/0	English Ingots	94.10/0 0/0/0
ng Battens,		OILS	
1 in. prep.		Linseed .....ton	22/5/0 0/0/0
.....	0/10/0 0/14/0	Cocoanut, Ceylon	36/0/0 0/0/0
2nd..	0/9/0 0/10/6	Do. Ceylon	30/0/0 0/0/0
er Quebec ft	0/5/0 0/7/6	Palm, Lagos	26.10/0 0/0/0
Cuba, ft	¼ ¼	Rapeseed, English	
ganz, &c.	¼ ¼	pale	30/0/0 30/5/0
ganz, Cuba,	/4½ /5½	Do. brown	28/10/0 0/0/0
Domingo,		Cottonseed ref..	21/10/0 0/0/0
cargo av	/4½ /5½	Oleine	21/15/0 24/0/0
clean do. do	/4½ /5½	Lubricating, U.S.	6.0/0 7.0/0
naco do. do	/5½ /7	Do. refined	7.10/0 12/0/0
churia do..	/5½ /6½	TAR—Stockholm	
Turkey ton	4/0/0 13/0/0	barrel	1/1/6 1/2/0
Rio	10/0/0 20/0/0	Archangel	0/13/6 0/0/0
ba	9/0/0 18/0/0		

TENDERS.

mmunications for insertion under this heading reach us *not later than* 12 *noon on Thursdays.*]

DENSHAW.—For sewering, levelling, paving, kerbing, and ng Chapel-street, Garden-street, Carbrink-street, and ow-lane Hooley hill, for the Audenshaw Local Board. Mr. J. erton, Surveyor, Ashton-under-Lyne :—

derwood & Bro. Dukinfield (accepted at per schedule of prices. [Seven tenders were received.

OFORD.—For new class-rooms to the Bunyan Meeting, Bed. Messrs Usher & Anthony, architects, St. Paul's Square rd :—

Larrison	1,228	Melcombe Bros.	£1,147
ater	1,226	T. H. Coleman	1,098
ayness	1,154	J. P. White	1,095
		[All of Bedford.]	

N.—For new Salvation Army Citadel, Bolton. Mr. W. e Scott, architect, 25, Bedford-row, London, W.C. :—

...stin	£3,588 0 0	W. Bryce	£4,400 0 0
D & Ellwood	4,000 0 0	Wm. A. Peters &	
owell	3,900 0 0	Sons	4,250 0 0
Hesketh	4,461 10 0	A. & T. Main, Lough-	
...rgreaves	4,446 0 0	borough (accepted)	4,225 0 0

BRADWELL.—For alterations and additions to Wesleyan Chapel, Bradwell, Derbyshire. Mr. Herbert W. Lockwood, architect, Queen Insurance Buildings, Church-street, Sheffield. Quantities by the architect :—

Thomas Roper	£1,065 0	E. & W. Oxley	£829 0
John Robertson.....	1,027 0	Hill & Lomas.....	778 10
C. H. Gillam	1,009 0	Hill & Brother, Tideswell*	775 0
		* Accepted.	

BRENTFORD.—For erecting new warehouse, stabling, &c., High-street, Brentford, for Mr. James Bradbury. Mr. S. Woodbridge, jun., architect, Brentford. Quantities supplied :—

D. E. Blasby	£2,062	J. Mason	£1,910
T. Hiscock	2,053	T. Gregory & Co.....	1,877
H. & E. Lee	2,039	J. Dorey & Co., Brentford*	1,821
Lansdown & Co.	1,998	* Accepted.	

BUCKLAND (near Dover).—For the erection of shop and residence, Buckland, Dover. Messrs Cresswell & Newman, architects and engineers, 54, Castle-street, Dover :—

H. Stiff.....	£945 0	W. G. Lewis	£835 16
Austen & Lewis	840 0	W. T. Dowle (accepted) ..	789 0

CARDIFF.—For the erection of a school, caretaker's house, kitchen, &c., Saltmead, for the School Board. Mr. J. P. Jones, architect, 27, Park-street, Cardiff. Quantities by the architect :—

Osborne & Co.....	£14,646 0	W. Symonds	£11,979 10
J. Allan	13,176 0	Shedle d & Son ..	11,948 0
Thos. Gough	12,010 18	J. Haines	11,793 10
D. J. Davies	12,709 0	Chas. Dunn	11,730 0
Henry Davies.....	12,571 12	Turner & Sons,	
Burton & Co.....	12,193 12	Cardiff*	11,702 0
David Davies.....	11,993 0	* Accepted.	

CHELMSFORD.—For additions to a four-mill. Mr. A. E. Christy, architect, 30, Great St. Helen's, E.C. :—

	Addition to Timber.	Addition to Brick.	Boiler House and Chimney-shaft.
Neal	1,417	1,425	454
Lynch	1,349	1,340	450
Higgs	1,305	1,325	440
West	1,290	—	—
Brown	1,235	—	—
Dupont	1,180	1,160	390
Gozzett	1,150	1,160	390
Johnson* ..	985	1,035	298
	* Accepted subject to modifications.		

CLACTON-ON-SEA. — For building and completing proposed alterations and new shop premises in the North Avenue, Clacton-on-Sea, Essex. Mr. A. W. Huxter, surveyor :—

W. G. Gingham	£1,487	J. C. Allen.....	£1,392
W. Sargeant	1,425	M. Potts, accepted ...	1,325
Ellis & Turner ...	1,410		

DEVIZES.—For erecting new premises for the Wilts & Dorset Bank, Devizes. Mr. G. M. Silley, architect :—

Geo. Humphreys.....	£3,991	Crook & Son	£3,537
H. Flowelling	3,873	W. B. Mullings (accepted)	3,495
Stephens, Bastow, & Co....	3,749	G. Brown	3,660

EASINGWOLD.—For cast-iron water-mains, valves, hydrants, and service pipes, for the Union Guardians. Messrs. Fairbank & Son, engineers, Driffield, Yorkshire :—

Thomas Bell, Market Weighton, Yorkshire . . £1,540 16 8

GREAT WYRLEY (Staffs.).—For additions to school, for the Cheslyn Hay and Great Wyrley School Board. Mr. John Greensill, architect, Great Wyrley, Staffordshire. Quantities by Mr. John Greensill :—

A. Williams.....	£346 16 10	J. Hunter	£320 10 0
R. Barton	335 0 0	S. Wootton, Bloxwich*	288 19 0
		* Accepted	

HOUGHTON-LE-SPRING.—For the construction of the main drainage and sewage disposal works for the town, for the Local Board. Mr. D. Paton, Consulting Engineer, St. Nicholas-buildings, Newcastle-on-Tyne :—

J. C. Telgmann	£4,450 0 0	C. R. Bell	£3,821 11 10
J. T. Snape	4,369 10 10	T. Dixon.....	3,716 0 0
Nicholson & Elliot ..	3,941 0 0	J. Carrick, Durham*	3,652 0 0
R. Hudson, jun.	3,897 0 0	* Accepted	
		[Engineer's estimate, 3,630.]	

ISLEWORTH.—Accepted for alterations and additions to four cottages, Lukfield-lane, for the Royal Brewery Company, Limited, Brentford. Mr S. Woodbridge, jun., architect, Brentford :—

W. Foord & Son..... £15 0 0

[No competition.]

KING'S CLIFFE.—For the erection of almshouses, "The Cornfield Homes," at Kings Cliffe, Northamptonshire. Mr. J. Southroyd Corby, architect, Stamford :—

Jno. Wootston	£1,630	R. Scholes	£1,409
W. Dean	1,620	Thos. Wootston	1,408
E. Bowman	1,590	Perkins Bros.	1,427
Thurlby & Son	1,577	W. Hilliam	1,421
A. S. Roberts	1,545	S. F. Halliday, Stamford*	1,407
Roberts Bros.	1,541	* Accepted.	

LANCHESTER (Co. Durham).—For the execution of sewerage works, at South Moor, for the Union Rural Sanitary Authority. Mr J. E. Parker, Engineer, Union Offices, Lanchester :—

Thos. Forster & Son ...	£236 16 9	Kellaud Groves, Chester-le-Street*	£745 0 0
Jos. Goldsbrough	791 4 8		
Thos. Thompson & Son	780 7 0	* Accepted.	

LEWISHAM.—For new farm buildings and repairs to Sturrage Farm, Ladywell, S.E., for Mr. Henry T. Wood. Mr. Edgar H. Selby, architect, 26, Craven-street, Strand, W.C. :—

H. T. Hoare, Lewisham (accepted)..... £243 7 0

LISCARD (Birkenhead).—For the erection of ornamental entrance-gates, fencing, conveniences, &c., New Park, Liscard Hall, for the Wallasey Local Board. Mr. A. Salmon, Surveyor, Public Offices, Egremont, Cheshire :—

J. W. Wilson	£1,412	T. Catterall & Co.	£1,325
E. Worrall & Co	1,502	A. Blackley	1,088
D. Hughes.....	1,457	Jas. Dunham.....	1,537
Chas. Smith & Sons	1,789	R. T. Smith & Co., Whitchurch (accepted)	1,487
W. H. Peake & Sons	1,671		

LONDON.—For the erection of Holy Trinity Parish-hall, recreation rooms, soup-kitchen, residence, &c., at Cann or Town, S., for the Rev. J. Russell, B.A., and the Building Committee. Messrs. J. T. Newman & Jacques, architects, 2, Fen-court, E.C. Quantities by Messrs. R. L. Curtis & Son :—

Sharps	£4,121	Morter.....	£3,847
Hearle	3,917	Reed	3,798
Catley	3,883	Hocking	2,939
		Commercial Improved.	
Whitford & Co.	4,498	Walter Jones	£746

LONDON.—For alterations, &c., to the "Bell," Leicester-street, Leicester-square, W., for Mr. R. A. Morgan. Mr. H. I. Newton, architect, 49, Victoria-street, Westminster, S.W. :—

Grover, Treharne, & Co. ..	£2,394	F. Mark	£2,225
Spencer & C	2,290	Patman & Fotheringham .	2,090
S. Golden	2,248	C. Dearle & Son	2,044
J. Ainley	2,200	Edwards & Medway*	2,005
		* Accepted.	

LONDON.—For alterations, &c., to the "Durham Arms," public-house, Hackney-road, E., for Mr. Alfred Lamb. Mr. Joseph G. Needham, architect, 11, Powercroft-road, Clapton :—

W. Higgs	£3,065	Mower & Son	£2,847
Coulsell Bros.	3,025	J. & F. Bane*	2,475
Walker Bros	2,981	* Accepted.	
		Gasfittings.	
Christie	£222	M. Christian	£166
F. Flushead	200	J. Dix*	164
J. Steadman.....	187	* Accepted.	
		Painter.	
T. Heath	£120	W. Prindle	£109
J. Edwards	120	W. Paddon*	97
		* Accepted.	

LONDON.—For alterations to the "Frying Pan" public-house, Brick-lane, E., for Messrs. Truman, Hanbury, & Co. Mr. S. W. Gritten, architect :—

Atherton & Latta.....	£1,780	Bovis & Co.	£1,385
Holloway Bros.....	1,470	Whitehead & Co. ..	1,325
W. Shurmur.....	1,453	J. Smith & Son ..	1,185

LONDON.—For the erection of the "Eclipse Glass Works," Lea Bridge. Mr. W. G. Shacbridge, architect :—

F. & F. H. Higgs	£1,780	W. Shurmur	£1,548
T. Bryce	1,623	Walker Bros.	1,542
Grover & Son.....	1,599	Turtle & Appleton ..	1,518
Goodall	1,588	J. Parker	1,510
J. Chessum & Son	1,549	J. H. Mollett	1,415

LONDON.—For new hall at the Upper Clapton Congregational Church. Mr. W. D. Church, architect :—

W. Dabbs	£2,842	W. Shurmur	£2,772
Woodward & Co.....	2,820	P. J. Coxhead	2,589
Holloway Bros.	2,790	J. Chessum & Son	2,087

LONDON.—For rebuilding the "Roebuck" public-house, Great Dover-street for Messrs. Truman, Hanbury, & Co. Mr. B. J. Capell, architect :—

F. & F. J. Wood	£[illegible]	Whitehead & Co.	£[illegible]
Staines & Son	7,957	E. Todd	7,454
W. Shurmur.....	8,715	Harris & Wardrop...	8,541

LONDON.—For foundations, &c., at Hancock-road, Bromley-by-Bow. Mr. H. Poston, architect :—

Holliday & Greenwood ...	£[illegible]	J. Mowlem	£126
Wm. Shurmur	442		

LONDON.—For alterations and additions at the "Bird-in-Hand" public-house, Bow. Mr. Edward Brown, architect, 1, Princes-street, Spitalfields, E. :—

S. Hayworth & Sons	£293	S. W. Hawkins.. ...	£703
J. Goodall	380	W. Higgs	353
J. T. Rose	347		

LONDON.—For interior decoration, No. 92, Gloucester-terrace, Paddington. Mr. R. A. Briggs, architect & surveyor :—

Lasgridge & Sons	£175	H. E. Anderson	£145
Blaster	160		

LONDON.—For alterations and additions to premises, Rotherwood-street, Bermondsey, S.E., for Mr. J. Armfield. Mr. E. Crasse, architect :—

A. W. Neal.....	£442 18	A. White & Co.....	£369 0
A. & W. Garner	443 5	T. W. Knight.....	368 0
A. G. Battley.....	409 0	Chatkley	363 0

LONDON.—For the erection of proposed mission-hall and caretaker's house, at Tabernacle-street, Shadwell, E., for the Rev. C. H. Turner. Mr. A. Aldridge, architect :—

Harris & Wardrop	£1,019	Balaam	£806
Heaple & Son	898	A. White & Co.	821
Cleaver	890	M. Calnan	803
Wilson	857		

LONDON.—For paving yards, van-sheds, stables, and factory floors with 14 in., 21in., and 3in. Patent Pengarvon, Victoria, or Imperial Stone, laid *in situ*, forecourts, corridors, playground, &c., at the All Saints Church Schools, Wandsworth, S.W., for the School Committee :—

Lewis Griffiths & Co., Millwall, E. (accepted), for Pengarvon Stone, at 3s. 10d., 4s. 6d., and 5s. 6d. per yard superintendence.

LONDON.—For paving with 2in. Patent Pengarvon, Victoria, or Imperial Stone, laid *in situ*, forecourts, corridors, playground, &c., at the All Saints Church Schools, Wandsworth, S.W., for the School Committee :—

Lewis Griffiths & Co., Millwall, E. (accepted), for Pengarvon Stone, at 4s. 6d. per yard superintendence.

LONDON.—For building road-walk to Victoria Model Houses, No. 21, Whitechapel-road, for Lord Radstock and the Building Committee. Mr. W. Gillbee Scott, architect, 25, Bedford-row, London, W.C. :—

W. Hearn & Co, Craven-terrace, W. (accepted) £3,343 0 0

LONDON.—For fitting up latrines, urinals, &c., at the St. George's Union Workhouse, Fulham-road, S.W., for the Guardians of the Poor of the St. George's Union. Mr. H. Saxon Snell, architect, London :—

Robert P. Beattie	£874	Flew & Co., 2 Bank buildings, West Kensington, S.W.	£699
John Peattie	749		
	745	* Accepted.	

LONDON.—For the erection of a conservatory, for Mr. C. Wells, Cliff-n Lodge, Thornton-road, Clapham Park :—

Downs Bros.	£278	0	£275 0 0
Potterton	278	0	W. Laing (accepted) . £268 13 4

LONDON.—For alterations and general repairs to 20, Tavistock-square, Hyde Park. Mr. Edgar H. Selby, architect, 26, Craven-street, Strand, W.C. :—

F. Cooper, Beckenham (accepted) £420 0 0

LONDON.—For works at the Bible Christian Schools, at Leatherhead. Mr. R. Williams, architect :—

Wells	£657	W. Vanstone	£[illegible]
Harrell	568	Powell	420

LONDON.—For painting and repairing the West-square Orphanage, Southwark :—

W. Vanstone (accepted) £160 0 0

MARGATE.—For the erection of sea wall and construction of promenade at Short Point, Margate, for the Town Council :—

Robeson & Rickett ..	£1,979	0 0	T. & W. Deme..... £1,700 0 0
Cooke & Co.	1850	0 0	

MARGATE.—For the erection of stable premises and a cottage at the Town-yard, Victoria-road, for the Margate Town Council :—

Bushell & Sons.....	£897	0 0	Barwick & Ansell £853 0 0
F. J. Doughty	875	0 0	Robeson & Rickett.... 846 0 0

MARGATE.—For erecting cottage and boundary walls, &c., at the Cemetery, for the Margate Burial Board :—

F. J. Doughty	£[illegible]	0 0	Robeson & Rickett £497 0 0

NEWPORT (Mon.).—For re-building Cumberland House, Cumberland-road, for Messrs. Hancock & Co., Limited. Mr. Jno. F. Jones, architect, 27, Park-street, Cardiff. Quantities by the architect :—

T. Prosser	£1,493	W. Blackburn	£1,150
Shepherd & Son	1,383	D. Davies	1,146
Jones & Son	1,247	W. Price	1,135
J. Linton	1,200		

NORWICH.—For the erection of a residence for the Medical Superintendent at the County Asylum, Thorpe, for the Committee of Visitors. Mr. T. H. B. Heslop, C.E., County Surveyor, Norwich:—

Downing & Son	£2,048	0	
A. J. Harvey	1,995	0	
Scarles Bros.	1,895	0	
Horace Lacey	1,893	0	
T. H. Blyth	1,890	0	
S. Hall	£1,845	0	
Evans	1,739	0	
Smith & Watling, Pitt-street, Norwich*	1,799	5	

* Accepted.

NOTTINGHAM.—For erecting Technical School buildings, and alterations in connection therewith, at the University College, Nottingham, on Mr. F. S. Granger and Mr. W. A. Hesketh, joint architects, Nottingham. Quantities by Messrs. Berridge & Barnes, Nottingham:—

A. B. Clarke	£13,692	0	0
C. Bacon	13,190	0	0
B. Kissling	12,722	0	0
Fiel & Son	12,720	16	6
J. J. Asters	12,720	0	0
E. Hind	12,597	0	0
Cuthbert	12,594	0	0
J. H. Clark	12,540	0	0
W. Wood-head	12,425	0	0
Hobson & Son	12,389	0	0
Barlow	12,389	0	0
J. Hind, Lincoln	12,380	0	0
Bell & Son	£12,290	0	0
H. Vickers	12,280	0	0
Thos. Whittaker	12,132	0	0
J. G. Thomas	11,867	0	0
Pidcock	11,808	0	0
Jos. Shaw	11,800	0	0
Gilbert & Gibbons	11,780	0	0
F. Messenger	11,767	0	0
Wheatley & Mapple	11,700	0	0
Evans & Co.			
Lingham*	11,647	0	0

* Accepted.

NOTTINGHAM.—For alterations and additions to the Basford Union Workhouse, Nottingham, for the Basford Board of Guardians. Mr. Herbert Walker, architect, Nottingham:—

Ingham & Son	£2,104	0	0
T. Cuthbert	2,100	0	0
J. Sells	2,060	0	0
J. F. Price	2,058	0	0
Henry Vickers	2,010	0	0
Wrigley & Maule	1,982	0	0
Henry Scott	1,942	10	
A. B. Clarke	1,791	0	
F. Messenger	£1,761	0	
J. Shaw	1,753	0	
Enoch Hind	1,741	0	
J. G. Thomas	1,567	0	
T. Barlow	1,540	0	
G. Hopewell & Son, Old Basford, Nottingham*	1,020	0	

* Accepted.

PAIGNTON.—Accepted for alterations and additions to the "Torbay Hotel" for the trustees of the late Mrs. E. J. Deudy. Mr. S. Woodbridge, jun., architect, Brentford:—

R. Harris, Paignton £1,048 0 0

[No competition.]

PETERBOROUGH.—For new Salvation Army citadel, Peterborough. Mr. W. Gilbee Scott, architect, 25, Bedford-row, London, W.C.:—

A. & T. Main, Loughborough (accepted) £1,400 0 0

RICHMOND (Surrey).—For alteration and addition at "Asholme," Parkshot. Mr. Edward Mountford, architect. Quantities supplied:—

A. Lilywhite	£624	0	
Soole & Son	491	0	
A. Hunt	488	0	
R. F. Busby	£444	10	
Sweet & Leader*	388	0	

* Accepted.

RUMNEY.—For additions and alterations to schools, for the School Board. Mr. Jas. P. Jones, architect, 27, Park-street, Cardiff. Quantities by the architect:—

Burt & Co.	£1,250	0	0
H. Davies	1,235	0	7
D. J. Davies	1,200	0	0
T. Gough	1,151	0	0
Castell	1,077	0	0
D. Davies	1,075	0	0
G. Griffiths	£1,070	10	0
Gobbett & Hutchinson	1,051	0	0
A. Elliott	1,042	0	0
Shepherd & Son, Cardiff*	1,032	0	0

* Accepted.

SEVENOAKS.—For alterations and additions to "The Warren," near Sevenoaks, Kent. Mr. H. Percy Monckton, architect, 32, Walbrook:—

Wallis & Sons	£1,920		
Pryer & Co.	1,800		
W. Couper	£1,868		
Axtell, Maidstone*	1,674		

* Accepted.

STUDLAND BAY (Dorset).—For the construction of two new roads on the Studland Bay Estate. Mr. W. Charles Evans, surveyor:—

Burt & Burt	£1,470		
H. & J. Hardy	£1,040		

TENBY.—For new roof to market, for the Mayor and Corporation. Mr. W. Newton Dunn, architect, 1, Bucklersbury, London:—

J. Thomas	£1,450		
Nicholls & Beynon	1,246		
D. & J. Davies	£1,080		
William Davies	1,017		

[All of Tenby.]

WESTGATE-ON-SEA.—For alterations and additions to Granville Lodge, Westgate-on-Sea, for Dr. A. Ford, J.P.:—

W. W. Martin	£555		
J. Shrubsole	448		
Bowman & Rickett	£447		

WINSLOW (Bucks).—For new banking premises for the Bucks and Oxon Union Bank, Limited. Messrs. Ayres & Ayres, architects, 8, Southampton-street, Bloomsbury-square, W.C. Quantities supplied:—

Matthews	£3,449	10	9
Marshall	3,300	0	0
Webster & Cannon			
Axtell*	£3,048	0	0

* Accepted as reduced, £2,990.

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G. H. (Thanks, not desired).—H. R. (The quotation is hardly worse than many other specimens of architectural criticism in the daily press).

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VOL. LXI. No. 2515. SATURDAY, APRIL 18, 1891.

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The Competition for the Battersea Polytechnic Institute.

BY the courtesy of the Goldsmiths' Company the drawings submitted in the final competition for the Battersea Polytechnic by the six selected architects are, during this week, on exhibition in the Hall of the Company in Foster-lane, Cheapside. The competition was divided into two sections, as is now so usual, and the preliminary drawings were drawn to a one-sixteenth scale; the final drawings were expected to be a development of the previous scheme submitted, without material alteration, but elaborated to a one-eighth scale. The six selected architects were Mr. John Belcher, Messrs. Henman & Harrison, Mr. E. W. Mountford, Mr. Sidney Smith, Messrs. Roger Smith, Son, & Gale, and Mr. J. Osborne Smith. Of these Mr. Mountford was awarded the first place by Mr. Rowland Plumbe, the committee's assesor, and he will, we understand, carry out the work. Illustrations of his design appeared in our issue of March 28.

There are also exhibited, with these competition drawings, sets of drawings to show what accommodation is being made for the other two South London Polytechnics. New Cross and the Borough-road were the localities chosen, and the Goldsmiths' Company undertook to provide the former neighbourhood with their Institute, and to bear the whole expense; for this purpose, the recently-vacated but substantial buildings of the Royal Naval School, with playground adjoining, have been acquired and will be altered and adapted by their architect, Mr. J. W. Penfold. The Borough-road Institute will be housed in the old buildings of the British and Foreign School Society, which have been acquired by the committee. The plans exhibited, which have been prepared by Mr. Rowland Plumbe, show the alterations to those buildings which are proposed, and also several additional buildings, the erection of which depends mainly upon the receipt of the necessary funds.

The site of the Battersea Institute, in the Battersea Park-road, is at the south-west corner of the land occupied by the Albert Palace; it is now bounded on two sides by existing roads, and will eventually be surrounded by roads; the area exceeds two acres in extent and is oblong in shape. The strongest points in our opinion in the selected drawings of Mr. E. W. Mountford are the simplicity of the plan and the perfectly straight, well-lighted corridors, in every case at right angles to one another. Each department appears to be easily approached from any other portion of the buildings, whilst each one appears to be capable of being shut off and used as a separate building, without in any way injuring its own convenience or interfering with the department adjacent, which may be in use at the same time for an entirely different purpose. The principal entrance is in the centre of the Battersea Park-road frontage, and leads through an entrance-hall to a corridor running right and left. This corridor is perfectly straight, and is lighted at each end and also amply lighted at the side from two courtyards, about 50 ft. by 60 ft., which give light and air to the centre of the block. The staircase is immediately opposite the principal entrance, and another well-lighted corridor runs from opposite the entrance to the back where it forms an entrance to the Technical Department, which occupies the north-west corner. On the right of the principal entrance, the members' committee-room adjoins the rooms of the men's social department, which occupy the south-west front. The adjacent refreshment-room for men faces the courtyard on the other side of the corridor, and is conveniently arranged in contact with the kitchen, which is also contiguous to the women's dining-room, though at the same time cut off from it. The women's department occupies the west front; spacious cloak-room and lavatories are reached by a separate entrance. The women's gymnasium occupies a separate block adjoining. A staircase leads to the women's club-room on the first floor, where the women's class-rooms are also placed. The Technical Department is a one-story building, occupying the north-west angle; a corridor divides the workshops, some of which derive their entire light from the roof, whilst the remainder have side light from the west and north. The corridor referred to continues in a straight line, and divides the swimming-bath on the north from the gymnasium on the south; both of these derive their light from the roof, though opportunities exist for side light were it required. The large hall occupies the east front, with the platform at the north end; a private entrance gives access to the artistes' retiring-room, but in addition to this there are three good entrances. At the south end two cloak-rooms are provided.

The first-floor shows the band-room, with four music-rooms overlooking each courtyard, at the back of the staircase in the centre of the block. The class-rooms are conveniently arranged in the front block, on the south of the corridor. From the first to the second floors three staircases give access to the laboratories and other rooms, which seem to be suitably arranged. The elevations will probably be more pleasing in execution, and create a more favourable impression, than is produced by the perspective drawing which is submitted. Putting other considerations aside for the moment, the elevations submitted by Messrs. Henman & Harrison show much dignity of treatment and deserve much credit; the reason they do not occupy a better position in the competition will be stated below. Taking the plan into consideration, the design submitted by Messrs. Roger Smith, Son, & Gale, and which forms part of the illustrations to our present issue, has many very good points. The corridors are straight and at right-angles, and, with one or two exceptions, well lighted. The position of the large hall at the east-end, in which this and the successful design agree, is entitled to place this design above the other competitors, though the acoustic advantages of the elliptical shape of the hall would probably be outbalanced by the difficulties and expense of construction. The architects' intention seems to have been to dispense with exterior ornament as much as possible for economy's sake, and the plainness and severity of the elevations must be, therefore, attributed to this desire. The treatment of the tower in its upper portions is capable of much improvement. The question of future extension has received every attention in this design, and the space avail-

able on the site is larger than in any of the other designs. The principal entrance leads into a large inner hall, with corridor right and left; a top-lighted corridor also runs from front to back, where it becomes the entrance to the technical department. The physical department occupies the north-west corner, and here the swimming-bath, the gymnasium, and women's gymnasium are placed side by side, with their axes pointing east and west. The women's social department occupies the south-west corner, whilst the men's social-rooms are immediately adjacent to the entrance hall. The music-room and dance-rooms on the first floor require to be somewhat more cut off from the class-rooms adjoining, and the lavatory accommodation seems to be somewhat restricted. With these exceptions the upper floor seems to have been carefully arranged. The interior of the hall, with its double balconies and columns from the ground to the roof, might have been treated with much more grace with advantage.

The designs of Mr. Sidney Smith, represented by a good set of drawings, appear to have been prepared with great care and method.* The ground-plan shows the principal entrance in the centre, with a corridor running right and left, another corridor, at right-angles to the last, runs straight through to the hall, which is placed in the centre of the north front, with its axis east and west; the corridor is carried round the hall, to which access is given by many doors to the hall. A separate entrance is provided in the centre of the back road, with ample cloak-rooms on each side, and much has been done to make this plan complete, though the best position for the hall is undoubtedly the east end of the site. The gymnasium and swimming-baths occupy the north-west corner, whilst the technical department is contained in a one-story building in the north-east portion of the site. Covered ways connect this and the other blocks. The band and music rooms have been accommodated in a separate building at the east end of the front block, which is a distinct variation on the other methods adopted by the competitors. The whole of the upper floors have lecture and class rooms carefully disposed on either side of the corridor, which is nevertheless well lighted. The elevations have been kept very plain in character, and are not the most satisfactory part of the design.

Messrs. Henman and Harrison submit drawings which show a carefully-thought-out design. The position of the hall is unfortunate, as the principal approach would be through the main entrance to the front block The corridors also are not straight in every case, and at places would be insufficiently lighted. A corridor is carried round three sides of the hall in a manner similar to that described for the last design. This is a very good arrangement, and is known to have been used with convenience and effect. The swimming-bath and gymnasium, lying north and south, and the technical schools occupy respectively the north-west and north-east corners of the site. The men's social quarters are in the south-west, and the women's in the south-east, with their gymnasium near at hand; a separate staircase leads to the women's cooking department and class-rooms on floor above, and this appears to be a good arrangement. The first floor is reached by two staircases, which are intended to serve both the front block and the gallery to the hall, an arrangement which cannot be commended. The refreshment room appears to be an inconvenient distance from the men's club-rooms. The elevations already alluded to are designed with much grace. The three spiked turrets must be excepted, as they could be modified with advantage.

The designs of Mr. J. Osborne Smith do not appear to grapple with the problems of the design with much success. The corridors are somewhat intricate, and the main entrance is made to serve for the hall as well as the main block. The hall occupies a bad position on the central axis of the site, and, though an entrance is provided from the back road, it merely gives access to the artists' rooms behind the platform. The exits and retiring-rooms also could be better arranged. The technical schools and physical department are placed respectively in the north-west and north-east of the site. A variation has been made by placing two mechanical drawing-rooms adjacent to the technical schools, instead of on the upper floors, and this seems a desirable innovation. The arrangement of the upper floors present few difficulties, though the staircases,—designed to be jointly used for the gallery of the hall and the front block,—cannot be entirely approved. The elevations are distinctly poor in character, the proportions being unhappy in many instances.

The last of the designs is by Mr. Belcher. The ground-plan shows a central entrance, with corridors right and left. A feature has been made of the staircase, and much space devoted to it. Opposite the main entrance a corridor runs straight through to the back, where it forms the entrance to the band and music rooms. The swimming-bath and gymnasium face the back road on either side of the centre, whilst the technical schools and the large hall face the west and east respectively. The eccentricities of the elevations are such as to discount the many good points of the plan. A little more time might have been well spent on the perspective drawing; half-hour sketches are not usually submitted in competitions, and it would be a pity to encourage the practice.

Judging from the designs exhibited, there seems every reason for agreeing with the assessor's award. It is to be regretted that the preliminary designs of the selected architects were not also exhibited. In the case of double competitions, which are becoming more and more common, where preliminary and final drawings are submitted, the exhibition of the preliminary drawings of the selected few with the final drawing might be made the custom with advantage to all.

* Mr. Sidney Smith wishes us to mention that the design was prepared by Mr. Thos. W. Aldwinckle in conjunction with him, and should have been so described on the drawings.

SEPULCHRAL MONUMENTS OF ESSEX.

THE only complaint we have to make against Mr. Chancellor's book of the Sepulchral Monuments of Essex,* is its great and unwieldy bulk. This is partly the result of the sumptuously wide margin employed, which will raise its value in the estimation of book lovers who have plenty of space in their libraries, but would seem rather unfavourable to its more general acceptance. However, it is a kind of collection more attractive to wealthy archæologists than to the general public, and certainly would have a highly respectable appearance in the library of an Essex proprietor or rector, which is probably the kind of *milieu* for which it is mainly intended.

The author's original intention was to collect drawings of the monuments, to be published with a brief architectural description; and for this no doubt architects would have been more grateful than for this genealogical tome. The archæological and heraldic element appears, however, to have grown in the course of the preparation of the work, till it is now rather a collection of annals of old Essex families, accompanied by illustrations of their burial-places. We must confine ourselves here to the architectural features of the latter.

The De Vere monuments at Hatfield Broad-oak and Colne Priory Churches are among the oldest in the book, as the De Veres were, according to the author, the oldest and most powerful family in Essex. These are tomb of the thirteenth and fourteenth centuries in the common mediæval form of an altar-like erection with the figure reposing on th top, and canopied niches with small figures a the sides. The monument to the fifth Earl of Oxford, on Plate II., is especially rich i the small and delicate foliated work on th sides. The design on the long side consists c three wide ogee-headed niches, crocketed an foliated, with miniature vaulting behin alternating with four narrow niches wit high triangular heads and finials, which ar or have been occupied by small figures, n all of them remaining. The contrast betwee the wide open arches and the narrow niche with figures is charming as a bit miniature architectural design. The lat tomb of the eighth earl (1371) is far inferi in architectural design, thin and wiry in i lines; it has an unbroken series of low foliate arches under each of which stand two o little doll-like figures, all of which rema except one. The tomb of the eleventh ea (1415), and that of his wife, is better design, it has five niches with angels holdin armorial tablets, divided by four-panell piers; the recumbent figures are finely ex cuted.

The Marney monuments follow, the ri canopied monument at Layer Marney chur being an interesting contrast with the medi val ones of the De Veres. Here we have t side of the tomb treated with classic rich ornamented balusters alternating with squ panels, the mouldings enriched with class ornaments and the centre of each fill with an elaborate wreath enclosing a sma shield. The effect is richer than in t Gothic examples, but it is less truly architec tural in character. The treatment of t "bedstead" canopy is very rich, but it is n improved by the curious nondescript orn mental erections along the top.

The Mildmay tomb at Chelmsford, one the two of which, by the permission of auth and publisher, we give reduced reproductio in this number (see lithograph), is of ve peculiar design, the author says "qu unique," though we rather think we ha seen something like it in another county. is because of its unusual design that we ha selected it for illustration; perhaps it is n very admirable architecturally. The str work in the midst of which is the inscripti tablet is a most unmeaning form of ornamen its best claim can be only that it "looks nea and fills up an otherwise plain spa which the artist does not seem to ha quite known what to do with; the doub curved and fluted top has a curious kind suggestion of a gill heating apparatus abo it. The author states that examination sho this upper part to be an after-thought, as it different in workmanship from the lowe and certainly the detail seems of differe date. The date 1571 on the upper part m therefore refer to the date on which this s normal erection was added. The monument to Thomas Mildmay and Avice his wife, t latter of whom died in 1557, and nine yea after, according to the Latin inscription, "t unrelenting king of terrors triumphed ov Thomas." The other monument we ha illustrated represents a typical form of mon ment often recurring in some parts of Engla in the Renaissance period, a figure kneeli sideways beneath a canopy supported classical columns. It is not an uncomm form in Norfolk. The date of this just at the end of the sixteenth c tury, as the subject of it, Mrs. Sou cotte of Witham, *née* Waldegrave, died 1598. There is considerable delicacy the details, and the figure is pleasing in simple and unaffected attitude. The curio piece of filigree work at the top, supporting t shield, is one of the many odd examples the kind of flourish which the Renaissan designers of tombs in England made use to fill up spaces or to form finials; th vagaries are numerous, and certainly creditable to the taste of the day, thou they are interesting as memorials of it.

The Bourchier tomb in Halstead Chur

* The Ancient Sepulchral Monuments of Essex; a record of interesting tombs in Essex Churches, and some account of the persons and families connected therewith, with nearly two hundred illustrations. By Frederic Chancellor, Architect. Chelmsford: Durant & Co. 1890.

probably a little after 1400, is, as the author says, a beautiful composition of its kind, though a little thin and weak in detail. It is a canopy tomb against the south wall, very complete and harmonious in design. The side of the tomb is decorated with a series of richly-cusped square panels each containing a shield; an early Tudor cusped arch forms the canopy, with a deep band over of panels with shields, with a smaller band of quatrefoils above. The angle shafts are carried up to form octagonal finials standing above the line of finish of the monument. There is a completeness and refinement about the whole which renders it a very interesting example of the late Gothic type of monument. The Bourchier tomb in Little Easton church is another example of late Gothic work of considerable interest, richer indeed than the one just mentioned, but not so unusual and refined in type. This latter is a canopy tomb standing free in the usual manner, under one of the arches of the choir. The Maynard monument in the same church, early seventeenth century, is a significant contrast to the two Gothic ones. It seems a reminiscence of the Gothic altar form of tomb, decorated at the sides with the figures of the children of the pair who are buried there; absurd stiff little figures kneeling in a row—

> "As if they did intend
> For past transgressions to atone,
> By saying endless prayers in stone."

They are not worse executed than some of the Mediæval figures, but totally destitute of dignity or solemnity,—mere puppets. The inscription tablet above, on the wall, has no architectural connexion with the tomb: it is stuck against the wall, an Ionic pilaster on either side, coats of arms blazoned as finials over the cornice, and the centre crowned with the grotesque emblem of a winged skull, a death's-head cherubim! Truly a descent from the Mediæval feeling in monuments.

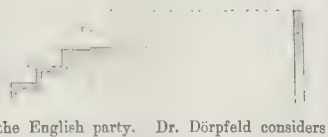
All the monuments of this date, however, are not so bald and ill designed as this. The Smith monument in St. Michael Theydon Church, has considerable artistic merit. This is one of the monuments with a recumbent figure leaning the head on one hand and looking outwards, which form a class by themselves The treatment of the arch, the ornaments at the back and the inscription tablet in the middle, is so like that of the Paston monument in North Walsham Church (see *Builder*, August 31, 1889) that one may conclude they were designed if not executed by the same hand. The upper story found in the Paston monument, however, is not here. The little obelisks standing on balls at the angles put in their appearance, and the centre piece is a bold sculptured panel with scroll mountings (again very similar to detail in the Paston monument), rather spoiled by the ugly projections on each side of the panel. The face of the figure is obviously intended as a portrait, and has a good deal of character. The Sir Thomas Smith to whom the monument was erected appears to have been a man of note, and played a large part in political affairs in his day; a sketch of his biography is given. It is also mentioned that he was an intimate acquaintance of John of Padua, whom he knew in Italy.

Among other Renaissance monuments illustrated is the Rich monument in Felstead Church, which as the author observes, is exceedingly Italian in character; so much so that we can hardly have a doubt of its being the work of Italian artists; the characteristic naïvete of English work is entirely absent. The little nude figure of Fame, over the tomb, also speaks a language not then known in purely English art. Another noticeable monument illustrated is the incised slab to Lady Alice Tyrrell, in East Horndon Church. It is incised alabaster, treated in the same way as a brass and let into the floor; the figure of the deceased, in finely indicated drapery, in the centre, with a border of niches and small figures at the sides. Over the head of the principal figure is an indication of vaulting, with the joints of the filling-in carefully shown; a rather unusual incident. Lady Alice Tyrrell died in 1422. As might have been expected, the slab is not in very good preservation. It is a curious and beautiful example of work of its kind, and it is to be hoped all possible care will be taken of it now.

Among other monuments illustrated in the book we may mention the Salberghe monument in Thorpe-le-Soken church, containing some rich decorated Gothic ornament, and a still finer and more sumptuous one of the same style (both of the wall-arch type) to Sir John Boutetort, in Walter Belchamp Church. The letterpress contains a great deal of historical information about distinguished members of old Essex families, which is of real interest, and perhaps contributes quite as much as the illustrations to the value of the book.

NOTES.

WE referred in a previous number (page 185, *ante*) to the discovery of the steps up from the orchestra to the stage in the remains of the Megalopolis theatre, as strong evidence against Dr. Dörpfeld's view that the Greek theatre had no elevated stage, and that the characters as well as the chorus acted in the orchestra. The steps were not all in existence, but there were three, and the remaining two, reckoning the same "risers," would have carried the steps up to the height of the top of the wall in the rear, regarded as marking the level of the stage. Dr. Dörpfeld, however, having inspected the remains, is of opinion that the English explorers have overlooked a detail in the upper step which should give cause to suppose it to be the termination of the flight of steps. The point is illustrated by the accompanying small section, which shows the steps and wall and the dotted restoration of



the English party. Dr. Dörpfeld considers that this is a mistaken view, arising from an inadequate examination of the exact structure of the top step. He says that the two lower steps are thus composed; an inner core of indifferent material is faced with slabs, which form the actual steps, the horizontal slab merely facing the vertical one of the next step; but in the case of the top step, supposing the two other steps to be superimposed, the horizontal slab would be continued in a perfectly unnecessary way under the superimposed step. This the English excavators, he says, ignore. The long horizontal slab was obviously, according to Dr. Dörpfeld, the top actual step when the theatre was in use, as it is now the top actually surviving one, and cannot, therefore, legitimately be continued by any other. Further, on this top step there is a slightly varied surface, common enough in Greek buildings, merely to give the line of a wall,—in this case probably the wall of the proscenium. If we are to accept this delineation of the upper step to be correct, there is no doubt something unexplained. But in that case what is the use of the lower steps? Mr. Penrose has been examining the remains, and when he returns to England we shall probably have his opinion on this interesting point. The conclusion that the Greeks had no stage and that the principal characters acted in the orchestra would very much let down the æsthetic of Greek play-acting, to our mind, and we are hardly prepared to adopt such a view on the strength of a small fillet worked on a step, especially taking into consideration the very obvious desire of German archæologists to find English archæologists in the wrong whenever they can.

THE closing day for receipt of exhibits for the International Art Exhibition at Berlin is now passed, and the hanging committees are having a great strain put on them, especially as the number of works of art sent in is far larger than they expected, and a very careful sorting will be required, so as to reduce the number to that for which there is hanging room. According to the local papers, Bavaria seems to be the only part of the German Empire which will not be properly represented, this gap being caused by differences between the respective Art Societies of Berlin and Munich, which latter city will hold its Art Exhibition simultaneously with the Berlin one, in spite of the protestations which have been made against this course. Among the non-Germans, the French will, according to the local papers, be to some extent represented after all, M. Bouguereau heading the list: and the French school of painting will be represented by a large number of exhibits sent by American artists residing in Paris. According to numbers, Russia and Spain seem to head the list of non-German exhibits. As regards the opening of the Exhibition, which will, as intended, take place on May 1, we hear that the ceremony will be performed by the Dowager Empress Frederick, the Emperor and his Court being present.

THE Committee of the architecture section of the Congress of Hygiene to be held in August are projecting an exhibition of architects' drawings of sanitary buildings and sanitary construction, to be on view during the Congress. The idea is, we believe, to confine the exhibition strictly to practical drawings; plans, sections, and elevations. A Sub-Committee consisting of Mr. T. W. Cutler, Mr. Rogers Field, and Mr. H. H. Statham, has been appointed to organise the exhibition, Mr. Cutler acting as Hon. Secretary. We are asked to call the attention of architects to this, and to say that Mr. Cutler will be glad to hear from architects who are willing to contribute drawings, if they will kindly communicate with him at 5, Queen-square, Bloomsbury.

GREAT interest is being taken in the proceedings of the Joint Committee of Lords and Commons engaged in considering the railway rates proposals, the attendance at the opening sitting on the 10th inst. being larger than could be accommodated. After some preliminary skirmishing by the counsel engaged, it was arranged that the schedules should be taken together as far as they were identical in terms; and that, should the Board of Trade be required to give the Committee their reasons for any of the conclusions embodied in the Provisional Orders, they should be given in open court. The Duke of Richmond—whose great experience eminently qualifies him for the position,—is the Chairman of the Committee, the composition of which has been attended with some difficulty, owing to such a large proportion of the members of the Lower House being more or less directly interested in the question. During the last few sessions, such members as are well acquainted with the subject, or have a personal interest in it, have naturally pursued it in such earnest as to have acquired a bias tending to disqualify them from serving on the Committee. Several names which were before the Committee of Selection have been rejected in consequence; while, of the former class, Dr. Hunter,—who is regarded by the railway companies as a traders' partisan, and was consequently strongly objected to,—has been retained. Sir George Baden-Powell tendered his resignation on the ground that he represents a constituency largely interested in the questions which have to be decided,—a very different position to that of a member personally interested, and one which could hardly be looked upon as a bar to service on the Committee. Lord Stalbridge, the new chairman of the London & North-Western, in his zeal for his company's interests, took the unusual course of communicating with the Chairman of the Com-

mittee of Selection direct, with respect to certain of the appointments objected to by the railway companies. It would have been supposed that such protests would have been made in the House of Commons through a Member, and his Lordship's action was called in question as almost amounting to a breach of privilege. The subject was discussed on Monday night, and, after explanations had been given, and Sir John Mowbray had testified to the unanimity which has invariably characterised the decisions arrived at by his Committee, Mr. Gladstone and Mr. W. H. Smith joined in expressing the complete confidence which the House possessed in the fairness with which the Committee of Selection discharged their duties.

AMONG the things "not generally known" may, perhaps, be included the fact that the senders of traffic by railway are liable to the company for payment of the carriage, notwithstanding that they may have consigned the goods "carriage forward." In other words, as explained on the 9th inst. by the Liverpool County Court Judge, the term "carriage forward" amounts, in the eyes of the law, to nothing more than a direction that the consignee is to be applied to for the freight, but does not destroy the right of the company to recover from the consignor if the application should be fruitless. Of course, as a general rule, railway companies look upon the instructions given on a consignment note as a *bonâ-fide* indication as to whether the sender or the receiver is liable for payment of carriage under the conditions of sale, and they often avoid loss and law expenses by a strict observance of the principle that possession is nine points of the law. Thus, goods consigned "carriage forward" are frequently detained until the freight is paid, and the right of recovering from the sender is but rarely resorted to. Sometimes, however, this is impracticable, as in the Liverpool case just alluded to, in which the "goods" consisted of a cage of lions,—a consignment which the company were glad to get rid of as speedily as possible, without staying to settle the disputed question of carriage.

BERLIN seems at last to be showing some energy in regard to the long-spoken-of Great "International" Exhibition. During last week several meetings were held on the subject, and at one, at which the representatives of the leading manufacturers and merchants of the Empire were present, as well as the Minister of Commerce, the scheme is said to have been definitely arranged. At a business meeting of the municipality the subject was seriously considered, and posters and advertisements were issued inviting those interested in the matter to attend a large public meeting on the 15th inst., at the Town Hall. According to the advertisement, the years proposed for the exhibition are 1895 or 1896.

FOR some years the Norwegian Government has been trying to reform the mode of technical education in their country, and, after due consideration of the requirements, they proposed the formation of,—(1) a Royal Technical College at Christiania, with full University rights, having four divisions,—one for architecture, one for civil engineering, and one each for mechanical and chemical technology, the annual cost to the country of such an institution being estimated at 114,000 crowns; (2) three Lower-Grade Technical Schools,—one at Drontheim, one at Christiania, the third at Bergen, each with three divisions (the building trades, technical engineering, and elementary chemistry), each of these institutions incurring an expense of 40,000 crowns a year which was to be borne partly by the Government, partly by the respective municipalities; (3) a number of artisans' evening schools for the winter months only, in which drawing would be the principal subject taught, whilst popular courses of elementary mathematics, mechanics, and chemistry, could also be given, these schools costing their respective municipalities about 6,800 crowns annually. The Government, in putting its proposals in the form of a Bill, has been defeated in its main object, the formation of a Technical College, this defeat, as we hear, being more due to party politics, and the choice of the city at which it was to be formed, than to opposition to an idea that would have satisfied a long-felt need. At present, the Norwegians have to obtain their theoretical technical education in other countries than their own, in Germany, France, and England, according to the specialties they wish to perfect themselves in.

THE case of Tucker *v.* Kaye, heard on appeal before Lords Justices Lindley, Bowen, and Kay, is a curious example of the effect of priority on the legal value of a patent. The plaintiff brought the action against Messrs. Kaye & Sons, the well-known lockmakers, for infringing a patent of his. The two patents were thus described in the report in the *Times* of the 13th inst.:—

"'My invention consists in making latches and other locks without any externally projecting bolts, thus avoiding the projecting sharp-edged bolts of ordinary locks and latches, which are apt to damage the clothes of passers by. I arrange the bolts of locks so that when they are drawn back by the key or door-handle entirely within the lock they are held in that position while the door remains open, but in closing the door another bolt, which, like the main bolt, does not project beyond the face plate, comes to bear against a slightly raised part on the striking plate, and is thus moved, releasing a detent, and so allowing the main bolt to advance and become engaged in the striking plate.' Then, after describing the mechanism in detail, the plaintiff declared his claim to be 'in combination with the main bolt urged forwards by a spring, a detent holding the bolt back when the door is open, but released by a projection on the striking plate in the act of closing the door, substantially as and for the purpose herein set forth.' The object of the defendants' invention was automatically to wedge a door tight in its place when closed, without hard slamming. It was thus described in the specification in the year 1888:—'It consists in arranging the lock bolt to shoot out straight from the door by the force of springs, and for the purpose of withdrawing the lock bolt from the striking-plate rack teeth may be formed on one side of the same, which gear with a pinion mounted in the lock case, the lock bolt, when withdrawn, being held back by an arm mounted on a pin, and which is automatically released on closing the door by the lock bolt coming in contact with the incline of the striking-plate, by which it is moved inwards, the springs compressed, and a bar released, so that on the lock bolt arriving oppo-ite an opening, it is forced out by the before-mentioned springs, and, being formed wedge-shape, fitting the angle of the flange of the striking-plate, holds the door tight in its place.'"

This looks like coming very near the same thing: but the defendants, while denying the infringement, relied especially also on a patent granted in 1881 "to a Mr. Wilson of Leeds" which they asserted was substantially the same as the plaintiff's patent, and therefore left the latter no ground for a claim for any such degree of novelty as would properly form the subject of a patent. The judges took the same view, and dismissed the appeal, on the ground that the plaintiff himself could claim no novelty over the previous patent of 1881. Whether the patentee of 1881 would have had any better ground for action does not appear from the report. The case shows the necessity of a plaintiff considering, before bringing an action for infringement, how his own patent is situated in reference to those which preceded it. Had the patent of 1881 not existed, the result might possibly have been different, so far at least as we can judge from the report.

THE Labour Commission has been constituted, and will shortly begin its sittings under the chairmanship of Lord Hartington. So much has been written in the daily press of the members of this Commission, that it is unnecessary to say more about it here, except to point out that though Lord Hartington is best known as a politician, yet that he is also a man of business, having for years attended to the Duke of Devonshire's various interests in the locality of Barrow-in-Furness. That many interesting facts will be elicited by this Commission is certain, and probably some minor legislation will ultimately result from its deliberations. But that it can have any sensible effect on the great question of the relations of capital and labour, we cannot believe, since they are governed by immutable economical laws.

THE arrangement made between the Postmaster-General and the Messenger Companies, by which the latter will still continue their work with the sanction of the Post Office, is very satisfactory to every man of business. The great size of London especially, has rendered such institutions as these absolutely necessary. An architect, for example, has to send plans to his client for inspection, or perhaps to show some alteration and needs them back at once. A messenger belonging to one of these companies is dispatched with them, and the whole matter is disposed of without difficulty. The only unsatisfactory point in connexion with the subject is that the Postmaster-General should not have made this arrangement before: he has been practically forced to do so by public opinion and by the energetic management of these companies. So far as can be ascertained the system is in force, not in consequence of the action of the Post Office, but in spite of it.

IN the case of "*in re* Whiteley and Roberts Arbitration," reported in the current number of the "Law Reports," Mr. Justice Kekewich decided this short, simple, and important point,—viz., that an arbitrator's award cannot be set aside, although he admits that he has been guilty of misconduct. The decision is based on the technical legal principle that an admission by one person is only evidence against that person, and not against any other. In the case in question the conclusion of fact at which the Judge arrived was that there had been an admission by the arbitrator that he had been bribed by one party, "from which of course the conclusion would follow that the award was corrupt." But, says the Judge, "proof by the evidence of others of such admission by the arbitrator is not sufficient to prove misconduct or fraud on his part." It is impossible in this place to discuss the legal question raised by this case, but to the common sense of most men it will appear altogether unjust that when, by evidence which the Judge believed, it is shown that the arbitrator has admitted that he has been bribed, the awards should stand. There now exists an "Arbitration Act," and we cannot but think that it should be amended by providing for such a case as this. It could be done by a section enacting that where a *primâ facie* case of misconduct had been made out against the arbitrator and one of the parties, then that the latter should show cause why the award should not be set aside.

THE Charity Commissioners have sealed, and the Committee of Council on Education have formally approved, certain important schemes framed under the City of London Parochial Charities Act, 1883, for the future administration of some principal technical schools in London. These are the Battersea, South Western (Chelsea), and Borough-road (Lambeth), Polytechnic Institutes, together with the Regent-street and City Polytechnics. For each of the first four a new governing body is set up, to include representatives of the County Council, the School Board, and (for all) what is termed the Central Governing Body established to carry out the provisions of the Act. For the Regent-street Polytechnic Mr. Quintin Hogg, so closely associated with its inception and career, is made governor for life. Among his first fourteen colleagues are nominated Sir Albert Rollitt, Dr. J. H. Gladstone, Sir Lyon Playfair, and Messrs. J. E. Kynaston Studd, F. A. Bevan, A. J. Mundella, and Howard Morley. Its annual income from without, consists of Mr. Hogg's gi

1,000*l.* for ten years from July 1, 889, with 3,500*l.* subsidy from the Central und. The new City Polytechnic is to be eated by a union for common membership, asses, apparatus, &c., of the City of London ollege and the Northampton (Clerkenwell) id Birkbeck Institutes. Each constituent ill retain its own governing body for separate ntrol, but the three will have a central overning body for general purposes. Capital ms and annual grants have been assigned these three institutions out of the Com- on Fund; besides the freehold or leasehold roperties they already possess. To the Bat- rsea Polytechnic the Commissioners under- ke to grant 2,500*l.* per annum as soon as ey are satisfied that the contributions, mounting to 60,000*l.*, are duly applied for he, buildings, and equipments. So, simi- rly, they will give 1,500*l.* yearly to the outh-Western Polytechnic,—for which the 0,000*l.* is subscribed,—upon the Manresa- ad site.* To the Borough-road Institute a annual grant of 2,500*l.* is promised. The orthampton Institute receives, yearly, 000*l.* from the Skinners' Company, a share 750*l.*) of the Robert Kitchin bequest to the iddlers' Company, and 3,350*l.* from the Fund. n every instance the Commissioners require th site and buildings to be vested in the ficial Trustees of Charity Lands, and that eir code of regulations for management and nduct of an Industrial Institute shall be opted and observed.

THE railway question in Edinburgh con- tinues to be agitated by the citizens. A w suggestion has been brought forward, d is to be embodied in a petition to Parlia- ent in opposition to the North British Rail- ay Bill. In the petition a belief is ex- essed,—

"That it is impossible, from the low situation of e ground upon which the Waverley station is built, convert it into a convenient railway station, and at ways and means may be found whereby both e great railway companies in Edinburgh may see to their own advantage, for the convenience of e travelling public, and for the improvement of he city, which ought to be an object for both com- anies, to form a joint station on the west side of othian-road, where the Caledonian Railway Com- any has ample ground for the traffic of both com- anies, and where a handsome station could be uilt on the level, more convenient for the travel- ng public, and more easily accessible from all arts of Edinburgh than the Waverley Station. If ch an arrangement shall be found desirable for l concerned, it would admit of the North British ailway lines and the Waverley station being re- oved from Princes-street Gardens and the valley f the old Nor Loch,—where they never should have een,—thereby greatly enhancing the beauty of the ity, and improving its sanitary condition. These ews, unfortunately, were not submitted by the orporation of the City to the House of Lords or he Committee of that House, which has lately re- orted in favour of the preamble of this Bill."

he Bill is objected to *in toto*. Meantime ne point at issue between the Town Council nd the Caledonian Railway has come to a atisfactory conclusion, the company having greed to throw back the frontage of the new tation to a point within the railings which t present enclose the station. It appears rom the *Scotsman* that the majority of the ord Provost's committee are in favour of dopting a conciliatory attitude towards the North British Railway Company, and that something like a scene" occurred at a meet- ng of the committee held on Friday of last week. Finding that the inclination of the ub-committee appeared to be to accept the nevitable in so far as the proposed double ine through Princes-street-gardens is con- erned, his lordship abruptly left the chair. A new chairman was elected, and it was re- olved to recommend that a deputation should confer with the railway directors in a concilia- ory spirit.

WE have received the first annual report of the "Hampstead and St. Pancras Sanitary Aid Committee," which appears to be an amateur association for hunting up insanitary corners and either persuading the owners or inviting the local authority to abate the nuisance. The Committee has taken action in regard to 173 houses, and reports that the majority of these have been "thoroughly rectified." The cases in which the Committee interferes are those of dilapidated or dirty interiors; damp floors ceilings or walls; refuse allowed to accumulate; water-closets unprovided with water, or not properly flushed, &c., &c. The Committee hope that clergymen, doctors, visitors, and others who go about among the poor will co-operate with them by reporting cases that come under their notice. Mr. Locke Worthington is the Honorary Secretary of the Committee.

* For view and plans,—Mr. J. M. Brydon, architect,—see the *Builder*, March 21 last. On March 28 last we published a view and a plan of Mr. E. W. Mountford's selected designs for the Battersea Institute.

THE new Church of St. John the Baptist, Epping, which was consecrated last week, stands on the site of the old free Chapel-of-Ease in the Street, or Townside, rebuilt, we gather, in 1833, *teste* Thomas Wright's "Essex," 1835. The original chapel had been granted by the canons regular of Holy Cross and St. Lawrence, Waltham, to one John Peryent, *circa* 1540. A few years afterwards the chapel was vested in trustees, and in 1622-62 two aisles were added. By a special Act the new church* will constitute the parish church, thus replacing the remote All Saints' at Epping Upland. This also had belonged to Waltham Abbey, and since the Dissolution has passed, together with the manor, through various families, comprising those of Sir Thomas Hennesge, upon whom the Crown bestowed it in 1572, and Finch, Grey, and Conyers of Copped Hall, close by. Latterly restored, at a cost of 3,000*l.*, the ancient building, with its conspicuous brick tower, credence-table, and three aumbries, has long been of interest to archæologists. According to Domesday survey Epping manor† appertained from earliest times to Holy Cross as founded by Canute's standard-bearer, Tovi. Other accounts make it to be part of the possessions with which Harold enriched that abbey. Adeliza, second consort of Henry I., gave the parish tithes to the monks, whose successors, converted into regular canons by Henry II, retained the church and its appurtenances until the surrender.

WE print in another column the resolution passed by the Birmingham Architectural Association at their last meeting, to the effect that if any new building is to be erected immediately adjoining and forming part of the new Law Courts, on the site at the back, it ought to be entrusted to the architects of the Law Courts, Mr. Webb and Mr. Bell, who alone could be expected to harmonise the new building satisfactorily with their original design. The subject had been previously drawn attention to in a letter from Mr. W. Henman, the architect, to the *Birmingham Post*, at the close of which he wrote:—

"If the intention is to find some means of giving to the Law Courts that dignity which, from the city side, they now lack, is it not, to say the least, wanting in good judgment and artistic appropriateness, to think of entrusting what is practically an addition to the courts to other than the able hands which have designed and carried out these buildings? Although I have had no opportunity of discussing this matter with my professional brethren in the city, much as I desire that Birmingham buildings should be designed by capable Birmingham architects, I feel sure I am but expressing their sentiments when I say that as a body they would willingly forego any chance of erecting the contemplated buildings under the condition that they are to harmonise with the Law Courts, which, interpreted by the public, must simply mean 'the same as.' Under such a condition no work of art can be produced. It can but result in failure and disappointment; and, although personally unacquainted with these gentlemen, I say, without hesitation, that Messrs. Webb and Bell, the architects of the Victoria Law Courts, are the only persons capable of harmonising the proposed building therewith in a satisfactorily artistic manner."

This is quite true; but it is not the less to the credit of Mr. Henman and the Birmingham Architectural Association that they should so chivalrously stand up for the artistic rights of the original architects, who are strangers to the town. It is not, we fear, every body of local architects who would act on that principle, and it is a pleasure to record our appreciation of the high-minded action of the Birmingham architects in this matter.

* A short description of the church will be found in another column. Messrs. Bodley & Garner are the architects.

† "Terr, canonicorum sancte Crucis de Waltham . . . Epingam tenuit semper sancta Crux pro manerio & pro il. hidis & xv. acris"—see P. Morant's "Essex," vol. I. (1768).

NOTES FROM ATHENS.

LIKE so many places nearer home, Athens has passed through an exceptionally severe winter. Till within about a fortnight of Easter communication with the interior of Greece was practically impossible. Snow was lying deep on the mountains, and even in Athens itself it had fallen plentifully from time to time,—a very rare occurrence indeed. Under such circumstances the work of archæological excavation has been hardly possible, the American school being the only one of the four schools that has attempted to do anything. Now, however, two members of the British school, Mr. Loring and Mr. Milne, have gone to Megalopolis to finish the entire clearance of the theatre, the work at which was discontinued last May. Mr. Penrose has also recently visited the site, and we hope shortly to have his opinion on the various points at issue,—especially the weighty question of the stage. Mr. Ernest Gardner has again resumed his duties at Athens as director of the school.

Now that the long-delayed question of who was to undertake the excavation of Delphi has been definitely settled, there seems every probability that the villagers of Castri, which occupies the site of the old sacred enclosure, will be immediately bought out, and that active operations will be commenced this spring. The new director of the French school, M. Homolle, has now under him five students, all of whom are new to Athens, with the exception of M. Legrand, who, last year, directed the excavations on the site of Troezen.

Opinions vary greatly as to the probable results of the excavation of Delphi. The soil is very thin, and the fact of the existence of a village built over the site diminishes very much the chances of finding much statuary or the like. The expectations of the French themselves are not great, but, in any case, we are sure to gain much additional topographical knowledge, and no doubt the harvest of inscriptions will be large.

Much excitement was recently caused in Athens by the premature announcement that the Americans had discovered the tomb of Aristotle at Eretria. This, as Dr. Waldstein pointed out at a meeting he held at the American School, while the work of excavation was still in progress, is too much to state positively as yet. The facts are as follows:—A foundation of a very fine tomb was discovered, obviously of some notable person. Beside it, in a later grave, a foot higher, and made of earlier materials, was the inscription:—

. . . . . ιστη
. . . ριστοτελου.

The finds comprised, amongst other objects, two silver styli and a pen, and, strangest coincidence of all, a terra-cotta of the philosopher type with the hands folded. Christodoros describes a statue of Aristotle standing in this attitude, and it is curious that close to an inscription in which the name of the great philosopher occurs such appropriate objects for his grave should also be discovered. There is a strong probability, though not an unfailing certainty, that things found in graves are suggestive of the life and tastes of the deceased. In graves of females, mirrors and female ornaments are found; in those of males, strigils and palæstric utensils. The occurrence of these objects may well lead one to believe, although they may not actually prove, that they had reference to the pursuits of the deceased.

We know that Aristotle died at Chalcis. From the American researches it would seem that there was a long street of tombs,—a road lined with graves, stretching from Chalcis to a point far beyond Eretria itself. It seems unlikely that all these graves were those of natives, other inscriptions found during these excavations commemorating persons hailing

from Antioch and Heracleia, for instance. There are thus strong grounds for connecting these discoveries with the philosopher, and it is a strange coincidence that this should follow so soon after the startling find, in our own British Museum, of one of his lost writings.

The other graves opened at the same place contained a profusion of beautiful gold work and jewellery, probably of Hellenistic times. The most striking find was that, in a female grave, of a pair of gold earrings in granulated work, in the shape of doves set with rubies and other gems. In other graves the breasts of the dead were covered with thin gold leaves in great numbers.

Professor Richardson, the Annual Director of the American School, has investigated the fortifications and inscriptions extant at Eretria, and Mr. Fossum has been excavating the theatre, which seems, from the description, to have been Romanised; it has remains of remarkable stage buildings, with an arched passage running cross-wise through them.

We believe that the excavations at Eretria have at present been suspended, and the three students who were engaged in the work under the directors have returned to Athens. It is probable that excavations may be begun on a site in Arcadia during the spring, and perhaps also further work may be undertaken at Platæa, where members of the school were engaged last session.

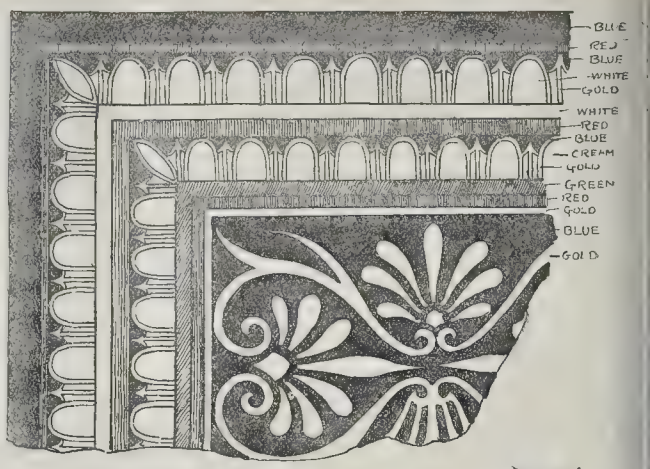
Dr. Dörpfeld has been giving his usual winter course of topographical lectures on the various sites and buildings of Athens and neighbourhood, and after he has concluded his annual Peloponnesian tour with the members of the German School, during the course of which he will visit Megalopolis, he will be enabled, by Madame Schliemann, to complete the work undertaken and left unfinished by Dr. Schliemann and himself last summer at Hissarlik.

Mr. Penrose has lectured, at the meetings of the British School, on the Olympieum and his excavations there, on the proportions used by the Greek architects, and, lastly, on the earlier Parthenon (the so-called Parthenon of Cimon), which he considers to be anterior to the Persian War, and, in fact, to be the old Hecatompedon referred to in an interesting sixth-century inscription lately pieced together by Dr. Lolling. He has had a pit dug on the site of the Olympieum showing a corner of the later work of Antiochus's time resting on the foundations of the Peisistratean temple. The work on the latter exactly resembles that on the substructure of the Parthenon generally attributed to Cimon, and goes to confirm his theory that it was of earlier date. He has also many other strong points in favour of this view,—one, notably, being the measurements of the early temple which he deduces from the builders' setting-out marks existing on this substructure, and from which he has worked out the proportions and relative sizes of the superstructure itself, which fits exactly with the name Hecatompedon, and the words of Hesychius. Mr. Penrose has also been further investigating the orientation of Greek temples.

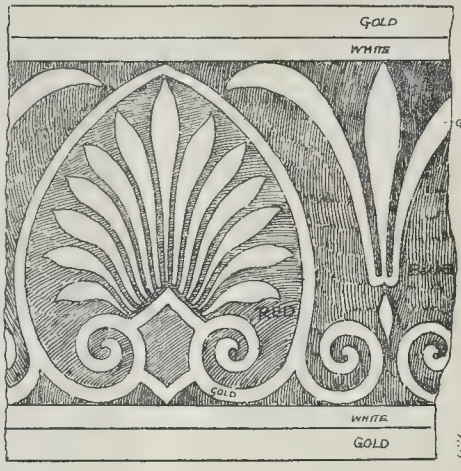
As the new writing of Aristotle proves almost conclusively that the temple by the Dipylon is not the Theseum (a point which Dr. Dörpfeld has long contested), Mr. Penrose has pointed out a very probable site for it on the northern slope of the Acropolis.

Now that the spring has fully set in, and that there is a chance of excavations being carried on in various parts of Greece continuously for the next two or three months, we hope to hear of other interesting and important discoveries before the end of the present session.

The English Iron Trade. The English iron market remains stationary. Great quietness prevails, and there is still comparative weakness in prices. At the same time, it is evident that consumers must be running out of their contracts, and will have to come into the market again before long. There has been greater firmness in pig-iron, at any rate on the part of makers, and buyers would readily place their orders if they could obtain some slight concession. Cleveland pig has improved 3d. per ton. The Glasgow warrant market has shown more animation during the week, but Scotch makers' iron is very quiet. There is not the least improvement in the hematite iron market, but makers have been able to maintain their prices. The quarterly meetings have not resulted in much business, the consequence being reductions in some departments of the finished iron trade. The steel market continues quiet and weak. Shipbuilders are not booking many additional orders. The engineering trades are without material change.—*Iron.*



PART OF CEILING DECORATION - PROPYLAEA, ATHENS



PAINTED ORNAMENT ON CYMA OF PARTHENON



PART OF GOLD SCEPTRE. INLAID - MYCENAE.







GREEK ENAMELLED JEWELLERY

Illustrations to Mr. Clement Heaton's paper on "Cloisonné in Ancient and Modern Times."

THE USE OF CLOISONNÉ FOR DECORATION IN ANCIENT AND MODERN TIMES.*

Egypt.

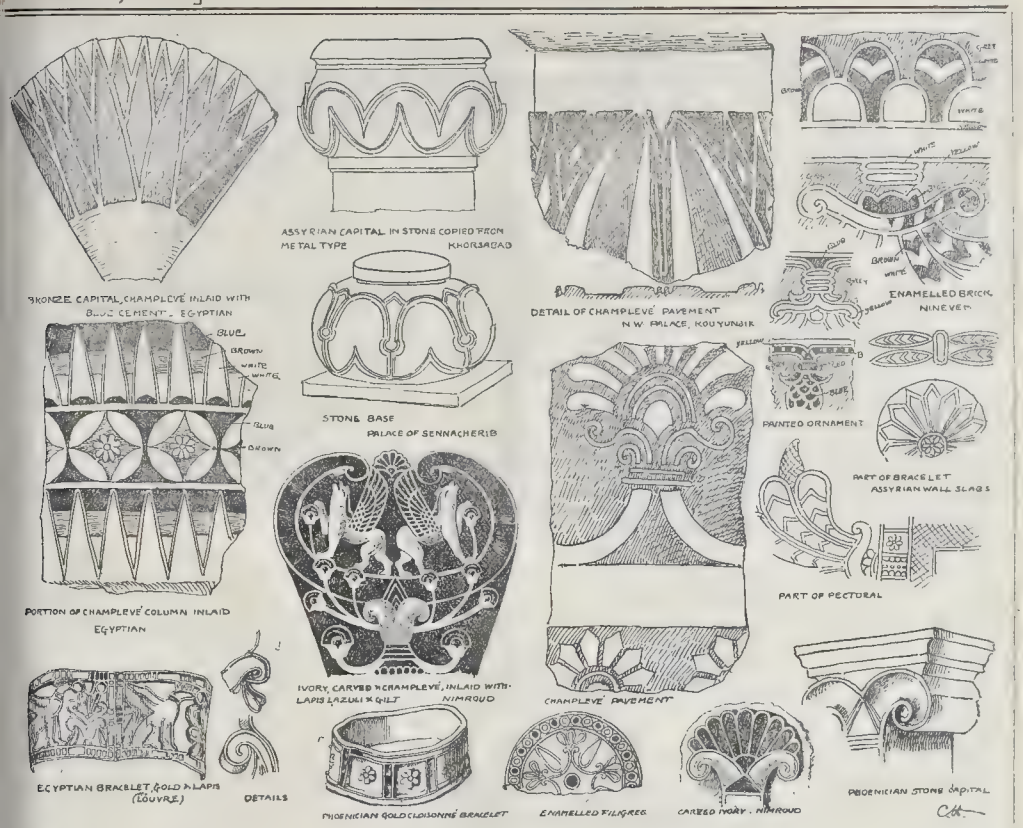
The history of *cloisonnage* begins on the banks of the Nile in the dim light of Egyptian civilisation. When Athens and Rome were yet unbuilt, the arts of working in metal were known in the land of the Pharaohs, and thirty centuries before our era, *cloisonné* jewellery appears to have been already perfected, and its use was continued through several dynasties. A statue in wood, found at Memphis, and said to date 3426 B.C., has the eyes laid in hard material and bronze lines. The mummy-case of King An-Antef, in the British Museum, is similarly treated.

Cloisonnage, among the Egyptians, was made not only in gold but in bronze, stone, porcelain, wood, and ivory. The mere enumeration of the materials used shows that it held no isolated place in their art. It entered, indeed, into the decoration of many kinds of work, and must have been held in the highest esteem. The proof of this is found in the fact that it held the place of honour in the adornment of the dead. Nowhere were the dead so profoundly reverenced as in Egypt, where it was a current belief that the eternal existence of the soul, which so much occupied their thoughts, was connected with the conservation of the body. The ritual of the dead prescribed that certain ornaments should be placed with the deceased, and the pectoral was the chief of these. These pectorals remain in great number, and are in the form of hawks and other emblems, sometimes in *cloisonné* of gold, but mostly in *champlevé* of less costly material; and these, after remaining in the darkness and silence of the tomb while the long roll of history was being enacted, are at last exposed to view in our collections. The finest of these are at Boulak, where that found on the body of Queen Aah-Hotep, dated 1703 B.C., is one of the glories of the collection. Another of great beauty, found in the tomb of Rameses II. the oppressor of the Hebrews, is at the Louvre, and there is a gold hawk in London.

Besides the pectorals, bracelets, necklaces, &c., were made in *cloisonné*, and the kings are represented as wearing such. The fine pair of bracelets at the British Museum are in gold and *lapis lazuli* and blue-lime cement, with figures modelled in low relief.

We find *cloisonnage* also worked in wood and ivory, which has been gilt. It was used for spoons, boats, and all manner of objects. There

* A paper read by Mr. Clement Heaton before the Society of Arts, March 24.



Illustrations to Mr. Clement Heaton's paper on "Cloisonné in Ancient and Modern Times."

s a winged figure in Jermyn-street Museum, in wood, with inlaid wings.

The system was also extended to architectural decoration. The great hawks and winged ions over the entrances, as at Karnak, are cut out and coloured in a way that produces a *champlevé*, and the vertical coloured lines, so often found on the cornices, are treated in the same way. It seems natural to suppose that these hawks, &c., were copied from the golden emblems in *cloisonné* jewellery worn on the person. And this the more that, in many examples, we find in the mummy-cases at the British Museum, scrupulously exact imitations in painting of the different kinds of *cloisonné* jewels formerly on the mummy within. The eyes, too, of the painted figures are certainly often copied from the inlaid bronze eyes found in some examples, and this explains their peculiar drawing.

I mention this particularly, because it is the first instance of the influence of *cloisonnage* on ornamental design, and this has occurred again in other times.

At the British Museum are also found parts of stone columns treated as a *champlevé*, inlaid with coloured porcelain, and two capitals are in bronze, which are true *champlevés*, and have been inlaid with blue-lime cement, part of which remains. These may have been parts of the light wood and metal architecture represented in paintings, and in which the design is just that suitable for *cloisonnage*.

It is evident, therefore, that in Egyptian art, the oldest art in the world, *cloisonnage* was deeply seated, and I think much of the technique of Egyptian drawing will be found to be due to the fact that the artist was thinking of inlay, rather than looking directly at nature.

The use they made of it for capitals and columns is suggestive of what might be done again. Mr. Aitchison said the other day, "We especially want to give the new materials employed, particularly iron, some vigorous stamp of architectural beauty;" and may it not be that, by returning to the source which has already yielded so much, new ideas may yet be gathered, and that the masculine vigour of early art may yet have a lesson for us?

Assyria.

If from the Nile we pass to the banks of the Tigris and Euphrates, we find the Assyrians and Chaldeans also making use of *cloisonnage*. Though the absence of tombs deprives us of any such record from actual remains, as in Egypt, inscriptions supply the void in great measure. It is sad to find these recount the ferocious cruelty of the monarchs, as well as their magnificence in decoration. We learn how captives were exposed before the great bulls and flung into the fosse, eaten by dogs, wild beasts, and birds of prey, "to rejoice the great gods!" at the same time that we learn the magnificence and sumptuousness of the palaces. Mr. Charles de Linas, who has minutely investigated the history of *cloisonné* jewellery,* cites several inscriptions. It is recorded that in Chaldea statues were draped with gold incrusted with precious stones; and Mr. de Linas considers, as the result of his inquiry, that within the temples were plates of metal or stone, inlaid with figures in coloured stones, and that the figures on the exterior in enamelled bricks were copies of this inlaid work, the enamels representing the material employed, — yellow, the gold; white, silver; red, cornelian; blue *lapis lazuli*, &c. The drawing of these figures is such as to lead me to think any other origin than that of inlay is impossible. The semicircular frieze over an entrance arch at Nineveh, of which a drawing is given, is an example of this.

The use of gold and precious materials was lavish; and this is the more easy to understand, when it is remembered that gold was valued in those early times precisely for its decorative qualities, and was not used for money, and that stores of this metal were extracted from every conquered foe. An inscription (604 B.C.) mentions a cupola covered with gold, and a temple enamelled and covered with gold.

Enamel is recorded as having been stored up in the Royal treasuries as a precious substance, and it would be interesting to know whence this enamel came.

If, from the inscriptions, we turn to the remains, we find represented in the wall-carvings, jewels, dagger-handles, and other personal objects, and the sacred tree,—so designed that they could certainly be executed in *cloisonné*,—and types of design, which would be natural for such work, are found in ornament, whether it be embroidery, painted work, or enamelled brick. I cannot but think that here, also, as in Egypt, the origin of much of the ornament is to be found in *cloisonné*. The records in the inscriptions of the use of metal, ivory, and precious stones in architectural decoration is quite in accord with existing remains, though, of course, little metal work has survived destruction.

MM. Perrot and Chipiez * show that wooden columns covered with metal were used in Assyria, and the volute is mentioned as originally being in metal. The only Assyrian columns discovered show a bulbous form of capital and base, in stone, evidently copied from a metal original, with raised *cloisons* as the only decoration. Place found remains of wooden shafts covered with bronze and gold scales

Furniture was made in metal, and with great luxury, as in the Book of Esther we read of gold and silver furniture in the palace of the king. The bronze thrones, &c., at the British Museum from Van in Armenia, show numbers of cells made in the bronze for the purpose of a colour inlay, and ivory slabs were also let into spaces provided.

The stone pavement slabs under the entrance arches, which were of great size, were really a *champlevé* in stone. Three of these are in the Assyrian basement room. An examination of them shows the surface to have been cut away to receive a colour-filling, part of which still remains. M. Perrot considers the design of

* "Les Origines de l'Orfèvrerie Cloisonnée." A perfect storehouse of facts.

* "L'Art dans l'Antiquité."

these more judicious and better conformed to the rules of art than the Roman mosaic. They are suggestive of the beautiful use which could be made of *cloisonné* for pavements at the present day. Two slabs were made in this way for St. Mary's, Stamford. Curved lines and the spiral predominate; and here, as well as in the painted work and enamelled bricks, I infer, the design has been derived from metal-work.

I have now only to mention the beautiful ivories from Nimroud. These were found in great numbers, and often repeated, and must have formed part of the decoration of the halls. Part of these come from Phœnicia, and they are of the greatest interest in connexion with our subject, because they are evidently a continuation of the Egyptian tradition, and are of *champlevé* in association with relief. The spaces cut out have been filled in with *lapis lazuli* and other colours, and parts gilt, and the design is such as to suggest that they are derived from the metallic work. I shall refer to these again in speaking of Phœnicia.

But before passing westwards to Phœnicia, it will be better to continue the history in the East down to our own times, as Oriental art has really continued much on its original lines, and has never lost sight of the true principles of polychromatic decoration. The East has been therefore a sort of reservoir of influence for Western art, which has again and again received a renewal of principles of decoration therefrom.

Persia and the East to our Own Day.

After the overthrow of the Assyrians, the Persians kept up the traditions of enamelling on brick, and it is to them we owe the grand series of works in low relief and enamel from the palaces of Darius and Artaxerxes Mnemon at Susa, now in the Louvre. One of these friezes is 12 yards long by 11 ft. high, in perfect preservation, with a procession of archers in profile, and bands of ornament. Another is a frieze of lions, with ornament above and below. Mr. Aitchison says of these that "they have not only enlarged the mind of every visitor in the Louvre, and have given an almost unique lesson in monumental colouring, but have also given an impetus to that beautiful branch of art, enamelled pottery. All the roofs of last year's exhibition at Paris were resplendent with colour, wholly due to the exhibition of these enamelled friezes."

Their effect is, indeed, of striking beauty—a harmony of soft blues, greens, and yellows, with a little white and dark brown. The whole treatment is that of a *cloisonné*, the outlines being fillets of clay, separating the enamel, and reflecting lines of light.

Cloisonné jewellery was in use in the 3rd and 4th centuries A.D., in the neighbourhood of Perim, and appears to have been a survival of the Assyrian tradition. In any case, the Græco-Bactrian armlet at South Kensington shows the use of gryphons very similar to the old Assyrian type of winged figure. At the present day a beautiful form of *cloisonné* is used for belts and horse trappings in Northern Persia—silver *cloisons* set with turquoise. In modern Persia, *champlevé* enamel has been in use, and in the tile work, as at Ispahan, the principle of *cloisonnage* is strongly marked.

India.

In Indian art *cloisonnage* is fully in evidence. We find enamels of Jeypore of both *cloisonné* and *champlevé*, and the lac-inlaid brass work from Moradabad is a *champlevé* of a most beautiful kind. Jewellery is made of enamelled *champlevé*, and bowls and other large objects are also made in it at Kangra and Cashmir. A specially beautiful association of gold and enamel is made at Pertubghur for jewellery; saw-pierced gold plate being embedded on the clearest possible copper-green enamel. This system seems to have been copied in Venice. The Guthrie collection at the Indian Museum shows a series of examples of jade inlaid with gold and jewels. The work in copper and bronze shows the extensive use of the raised edge, and the same principle is carried into the architectural ornament. The resemblance between this and the Ionic Greek work is startling, and examination shows it is due to the principle being the same, while the design is different; the system in both being the use of a raised edge and concave surfaces. The Jeypore folio of architectural ornament fully illustrates this, and actual examples in the entrance-court, especially the *façade* of a house from Bulandzhaha. Here we find, also, the use of pierced stone lattice work, which is so characteristic.

In Burmah the *cloisonné* principle is predominant, and the two cones from the Palace show the actual use of *cloisonné* and gems. But the principle is so coarsely applied, that it is of little further interest.

China.

Passing to China, we find the principle has been introduced, and has struck deep root. It was perhaps imported with Buddhism from India, as *cloisonné* vessels were reserved for sacred uses. It was at its greatest development there about 1450, after which period it was somewhat neglected, but again came into favour under the Tai-thsing dynasty. The works of this period are paler than the earlier ones. It is said that one of the Emperors worked at it himself, as Louis XVI. did at lock-making. It was then entirely neglected, and was revived, through European demand, of late years, the traditions never having been quite lost.

Japan.

The Japanese received their tradition of *cloisonné* enamel through the Corea. While in India the tendency is to *champlevé*, in China and Japan it is as much towards *cloisonné*. The oldest Japanese works are decorative and vigorous in character, dark in colour, with green predominating. The *cloisons* are well marked, and the forms such as naturally arise in the bending of the metal lines.

Their modern work has been carried to a perfection, which I do not think possible to be surpassed, and which, from a technical point of view, puts every other production of this work in the background. The delicacy is microscopic, and the mastery over the *technique* of the enamel really wonderful; but still we prefer the older works, and feel that the Japanese are losing the true value of the material, and, like the Limoges enamellers, seeking to make a purely decorative and ornamental art a vehicle of representation for which it is not fitted. On the other hand, they have worked out schemes of soft and neutral colouring, which show what possibilities are latent in the system for modern use. The latest developments are the use of aventurine, and a scheme of design on a blue-black background, which is one of the loveliest forms I have yet seen. This constitutes the present day development of traditions which commenced in Egypt nearly fifty centuries ago, and which have been in use ever since. The little Japanese we lately saw at work in London is a modern representation of the ancient worker on the Nile, whose ashes have long mingled with the desert earth, but whose works yet remain.

Returning West, to pick up the thread where we left it at Assyria, we find the Phœnicians on the shores of the Mediterranean. They were allied with the Chaldeo-Assyrians by origin, and, as the great commercial *entrepreneurs* of the day, were in constant communication with neighbouring peoples, and copied their art and that of Egypt, and spread these mingled traditions in the West in the course of their trading. One of their centres, Cyprus, was the meeting-place of many currents, and here we find the art of Greece in contact with Eastern art. De Cesnola has here found a *cloisonné* bracelet, and enamelled filigree brooches of Phœnician work. This bracelet is in the Egyptian style, but with an Assyrian element introduced. This one piece is sufficient to show that they made *cloisonné*; and the ivories found at Nimroud, as I have already said, suggest by internal evidence that they were designed on the lines suggested by the metal *cloisons*.

The Phœnician stone capitals found at Cyprus, and illustrated by Perrot and Chipiez,* have motives borrowed from this ivory work, showing how stone forms were borrowed from the *champlevé*; and again, a very early type of Ionic capital, illustrated in the same work, shows a transition from these Cypriote capitals, so that it would seem as if the Ionic capital is based through this medium on the *cloisonné* jewellery. A parallel case is the sarcophagus found by De Cesnola, which shows a form of antefixal ornament half-way between the ivory *champlevé* and the later Greek form.

* "L'Art dans l'Antiquité." Vol. III.

The Hebrews.

It will be remembered that Solomon had Phœnician workmen from Tyre when he was building the Temple. From the fact that the Phœnicians used *cloisonnage*, we may infer that it would probably be used in the Temple; and from the descriptions, and from the fact that the Hebrew word translated "carve," means to cut or engrave (Smith's "Dictionary of the Bible"), in the accounts given, I am led to think it certainly was used there; but as no remains exist, it would take too long to pursue speculations on this subject.

Greece.

If we pass across the Ionian Sea to the sunny land of Greece, we find evidence of the *cloisonnage* system being know to the Greeks. In the archaic work of Mycenæ and Tiryns the peculiar spiral ornament found on the stone pillar at Mycenæ and other places, which Fergusson regretted we did not know more of, has now had its origin cleared up by the discoveries of Schliemann. It is evidently a copy in stone of a purely metallic ornament.

Mycenæ was a powerful fortress on a rock rising out of a level plain, and the royal residence of a warrior race, who loved architectural beauty and personal adornment. Armour, weapons, and utensils were of precious material, and most delicate and graceful workmanship. The palace was rich in colour, bronze, and alabaster.

The tombs of the Royal occupants have held the treasures now well known, which are largely of gold and bronze, and here we find the spiral lines and raised edges from which the ornament on the stonework was derived. A sceptre in *cloisonné* of gold, inlaid with rock crystal, was also found.

The timbers of the buildings and the doors were encased with plates of bronze, and slabs of alabaster, inlaid with glass and richly carved, decorated the vestibule at Tiryns. Metal plates were also used to cover the vault of the tombs of Attrius and others. It is generally admitted that early Greek work was largely metallic, and the descriptions in Homer refer to the use of metal decorations. This use of metal led to the use of an edge rather than to relief.

In the fully developed Greek art we find the goldsmith's work still carrying out the same idea. It is of filigree work and *repoussé*, with enamel colour used with the greatest restraint, and just enough in quantity to give contrast to the gold. The work is so refined and beautiful, so right in scale compared to the human figure, that one cannot imagine it to be surpassed; and we can guess what it must have looked like when adorning some lovely Greek. In later work this restraint and refinement disappear. Enamelled filagree is still made by hereditary Greek smiths, who have kept up the tradition of the ancient Greeks.

The bronze work shows the constant use of an edge in contrast with broad, rounded surfaces, and damascening with silver and gold.

If from the metal work we turn to the Greek architectural ornament, we find the same feeling prevailing. I have already mentioned the Ionic capital and the antefixal ornament. In Ionic work, as at the Erechtheium, we find further evidences of the *cloison* principle. The plaited moulding of the capital was inlaid with coloured glass, as shown by Hittorf. The whole of the carving shows the use of the edge, as, for instance, in the frieze, where the flower ornament is an edge about half an inch wide, on a sunk ground, and this edge is again grooved on its surface, so as to produce yet other lines. The same character marks the egg and dart, and other mouldings above the frieze. If these were gilt, and the background coloured, as seems was the case, the effect would have been that of a *cloisonné*, full of sparkling light and colour.

In Doric work the painted ornaments on the moulding are, in design, quite a *cloisonné*. I have drawn out full-size mouldings from the Propylæa and the Parthenon, from data given by Mr. Penrose in his work, and a part of the ceiling design, and it will be seen how the sumptuousness of the colour* is still full of grace and refinement, due to the gold dividing lines. These coloured parts, far from hiding the beauty of the marble, would add to it by contrast. Whatever may be thought of Greek

* The medium used was encaustic, a mixture of wax and resin. The red pigment was oxide of iron; the blue, carbonate of copper; the white, carbonate of calcium (chalk); the dark green, Verona earth.

polychromatic decoration, which has been the subject of so fierce a controversy, one thing is certain, that they did use colour at the finest period, and they designed it on the principles of *cloisonnage*. If at a later time they discontinued it, it was contemporaneously with a decline in their art.

All through Greek work the edge seems to be used in contrast with the broad surfaces, and I cannot but think the Greek artists were fully conscious of the value of this system. The flutings of columns, the mouldings, and even the drapery of the figures (which is raised into ridges and deep groves) all carry on the same idea. Mr. Elsey Smith says, "One can still sit in front of the Propylæa at Athens, and watch the sun as it creeps round, gradually bringing out new lines of light."

If this is so, does it not offer suggestions for our Renaissance work of to-day. For instance, may not the concave treatment be the right treatment for carved work for our London atmosphere? Relief work requires to be clean, and to have a fairly good light to be readable; but edge-work, no matter how dirty is the surface, how dull the light, will hold its own. Evidence of this may be seen by a comparison of the carved panels in the Foreign Office and Treasury. It is remarkable that, while particular *motifs* of Greek ornament have been copied *ad nauseam*, the principles on which the Greeks worked their ornament should have been so little used.

And, again, in the interior of large public buildings, where the relative value of colours must be soon destroyed by dirt, and made to approach uniformity, how greatly it would enhance and preserve the effect if the system of design were based on *cloissonnage*, so that a delicate weaving of gold lines through the whole would remain long after the purity of these colours was lost, and render the whole intelligible.

And bands of *cloisonné* could be used in conjunction with marble, as suggested by the mouldings of the Propylæa. The use of *cloisonné* with sculpture, as a means of introducing colour without loss of preciousness, is suggested by the coloured bands of the Parthenon.

I must now briefly continue the history after the Greek epoch.

Roman.

In Roman work, we come upon a gap in the history. For the first time, so far as I know, in the history of art, the edge system is lost, and gives place to rounded relief ornament. There is consequently a marked contrast between Roman and Greek ornament. May the explanation of this be found in the fact that hitherto, architectural ornament had been mainly flat polychromatic work, used in association with figure relief, and that under the Romans, colour and figure ceased to be generally used? However, traces of the *cloisonnage* system still remain here and there, as at Pompeii, where large numbers of borders are based on a type of design formed of yellow lines on some dark colour. Mr. Gardner showed us, the other evening, that quite important pieces of *champlevé* enamel were made for the Romans by the British, which goes to show that the Romans appreciated it when it was put before them, and large numbers of examples of Gallo-Roman *champlevé* have been found.*

SUGGESTED NEW SOURCES OF WATER SUPPLY FOR LONDON.

In our issue for the 4th inst. (p. 267, *ante*), we referred to the reports made by the Engineer of the London County Council (Mr. A. R. Binnie) on this subject.

Mr. Binnie, in his first report, after dealing with the statistical facts of the existing supplies, proceeds to speak of the possibilities of a future increased supply to be obtained from the Thames, the Lea, and the chalk. As to the Thames, in its present state, he shows that little or nothing is to be hoped for in that direction, in point of quantity, even if the quality were, or could be depended upon to continue, all that could be wished. He shows that the continued abstraction by the London water companies of from one-fourth to one-third of the total volume of the river in the height of summer, without affording one drop of "compensation water," must be highly detrimental to the river. Indeed, he says that the abstraction of such a large volume of water by the companies goes some way to explain the bad state of the river in recent years, for, he adds, "the purity of the fresh-water portion of the Thames above Greenwich is entirely dependent on the flow over Teddington Weir." As to the Lea, he quotes and endorses the opinion of the Royal Commissioners on Metropolitan Water Supply, 1869, that "we ought not to calculate on any material increase from this source." He, moreover, quotes from evidence given before the Royal Commission that at some periods the New River Company and the East London Water Company have taken the *whole volume* of the river,—"there was nothing went by" the intakes. This appears to have happened so far back as 1864, and is quoted as the evidence of the Engineer of the East London Company. As to the possibilities of further supplies from the chalk, Mr. Binnie quotes the conclusion of the aforesaid Royal Commission, which was as follows:—

"We do not agree with those who expect to get an almost unlimited increase of quantity of water by simply tapping the natural reservoirs in the chalk, for the supply of them must obviously be limited by the amount of rainfall. Moreover, as the water which penetrates into the reservoirs, raising the water line more or less above the level of the adjoining valleys, ultimately in greater part finds its way by springs into streams at the lower level of the district, any water drawn from the store by artificial means will most probably be at the expense of those streams.

If this be true, it follows that any water obtained by tapping the chalk reservoirs that feed either the Lea or the Thames above Hampton would only *pro tanto* diminish these streams, and would therefore be little or nothing gained to the general supply."

The summing-up of the Royal Commissioners on the subject of increased supplies from the Thames, the Lea, and the chalk was as follows:—

"Combining now these several sources, we may estimate that, if ever the Metropolis should increase to such an extent as to render necessary such a large supply, and to justify the outlay for works necessary to obtain it, we may calculate upon getting from the basin of the Thames—

	Gallons per day.
From the main stream, supplemented by the aid of store-reservoirs, say ..	220,000,000
From the Lea	50,000,000
From the chalk to the south and south-east of London	30,000,000
Or say a total of	300,000,000

As Mr. Binnie remarks, it is clear that this supply of 300,000,000 gallons a day, at the rate of 30 gallons per head, would suffice for a population of 10 million persons.* "but, as stated, it can only be obtained by the construction of expensive impounding reservoirs in the upper valley of the Thames, to store the excessive flow of wet against periods of dry weather."

Mr. Binnie points out that one very important feature in which all the works which supply London differ from those constructed by large municipalities in other parts of the country is the absence of any supply of compensation water to be sent down the rivers in consideration of the quantities abstracted. It is no doubt, he says, partly due to this fact that the London water companies have been able to maintain so favourable a financial position as compared with other large municipal waterworks, and

"It becomes a grave question of inquiry, should the Council become the possessors of the existing works, and attempt to increase the supply, as suggested by the Royal Commissioners, whether Parliament would not require them to give compensation in water, and this should be borne in mind in fixing the value of the existing works, as neither the companies nor the Council can very largely increase the present supply without constructing some such impounding reservoirs as those suggested by the Royal Commissioners of 1869."

As to the quality of the water now supplied to London, Mr. Binnie says that notwithstanding the fact that the valleys of the Thames and Lea are thickly inhabited, almost entirely covered with cultivated and manured land, and that those rivers receive, in a more or less direct manner, the drainage of many towns, yet, as proved by chemical analysis, and the comparatively low death-rate of the metropolis, the water supplied from these sources is fairly good and wholesome. "In other words, it would appear that, if properly filtered, river water, to a certain extent and under certain circumstances very considerably contaminated by town drainage and the flow from manured lands, may be supplied without injury to the health of the population; *but this opinion must be taken with a certain amount of reserve, as our experience is hardly sufficiently wide, and in the case of the Thames has never been tested under the conditions which would subsist were a severe epidemic of cholera, typhoid, or other virulent epidemic to break out in any of the towns which drain into it.*"*

"It becomes a very important subject of inquiry" (continues Mr. Binnie), "granted that sewage from healthy towns is not deleterious to health when mixed with river water of a sufficiently large volume which has travelled down the stream for some miles, what would be the risk to the health of the metropolis supplied with water from the Thames, in the case of any serious outbreak of infectious or contagious disease in any of the towns draining into it."

With regard to other possible sources of supply, Mr. Binnie says that the quantity required to be provided is so large as to render wells and pumping almost out of the question, except as an auxiliary to some other project. Consequently, as we must, before all things, obtain a supply unimpeachable on the question of quality, it will be necessary to resort to some comparatively uncultivated area on which there is a heavy rainfall, as the amount of the latter will largely affect the size and cost of the works. Such areas are only to be met with among the higher hills and mountains of this country, in Cumberland, Wales, and Devonshire, where the rainfall amounts to from 60 to 100 in. per annum, as compared with, say, 27 in. on an average in the Thames Valley.

Dealing with the Welsh schemes, Mr. Binnie reports first on the Upper Severn scheme, which was first suggested by the late Mr. J. F. Bateman, F.R.S., as far back as 1865. Mr. Bateman proposed to derive the supply from a total catchment area of about 204 square miles, or, say, 130,500 acres, on the tributaries of the upper parts of the Severn about Welshpool, Newtown, and Llanidloes, known as the Vyrnwy, Banw, Carno, Tyrannon, Clwedog, Tylwch, &c. The flow from this area was proposed to be stored in seven reservoirs of a united capacity of 6,709,000,000 cubic feet, or 41,932 million gallons, and from which Mr. Bateman proposed to obtain 230 million gallons per day for the supply of London, after giving out as compensation to the streams 73 million gallons a day, these calculations being based on an average annual rainfall of 75 inches, of which 36 inches would be available for supply and compensation. But Mr. Bateman also pointed out that, if required, the supply could be increased to 300 million gallons a day. The water, as tested by Mr. Bateman, and afterwards by the Royal Commissioners, was found to be of good quality, containing only from 2½ to 4½ grains of solid matter per gallon, little organic matter, no traces of pollution, and having a hardness of 1 to 2 deg. Mr. Bateman proposed to convey the water to London in a conduit starting at a level 450 ft. above the sea, which, passing by way of Marten Mere, near Montgomery, and the towns of Bridgnorth, Stourbridge, Henley-in-Arden, Warwick, Banbury, Buckingham, Aylesbury, Tring, Berkhampstead, and Watford, would, after a course of about 180 miles, terminate near Stanmore, at an altitude of 270 ft. above the sea. At Stanmore he proposed to construct service reservoirs of a capacity of 2,000 million gallons. Mr. Bateman's estimate of the cost of this scheme was based on the works being carried out in instalments, as the requirements of the metropolis might necessitate, the expenditure being spread over four periods, as follows:—

Instalments.	To supply million gallons per day.	Cost.
1st	130	£8,685,006
2nd	170	10,571,615
3rd	200	10,822,474
4th	230 .	11,400,023

The practicability of getting a supply from the district indicated, as to the construction of reservoirs, the quality of the water, and the advantage of going to a great distance to procure a pure, wholesome, and uncontaminated gathering-ground, has since been proved, says Mr. Binnie, by the fact that the City of Liverpool has obtained Parliamentary powers, and has constructed works, under Mr. Thomas Hawksley and Mr. G. F. Deacon, to take the water of one of the identical streams proposed, viz, the Vyrnwy, and convey it a distance of about

* The remainder in our next.

* According to the last annual report of the Local Government Board, the average daily supply afforded by all the Metropolitan water companies together for the year ending December 31, 1889, was 166,942,483 gallons, which gives an average of 29·91 gallons per head of the average daily population, then estimated at 5,581,491.

* The italics are ours.

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sixty-six miles to Liverpool. This Liverpool scheme, by deducting some 18,000 to 20,000 acres of gathering-ground, reduced by that amount Mr. Bateman's proposed area of 130,500 acres, but sufficient still remained, and the area could be added to and increased, if required, to suit the demands of the metropolis.

Mr. Binnie next refers to another Welsh scheme,—that which proposes to go to the region of the Upper Wye for its gathering-ground. This scheme, Mr. Binnie believes, was first projected by the late Mr. H. H. Fulton, and brought before the Royal Commission in 1867. He proposed to appropriate a gathering-ground of about 440 square miles, or 281,600 acres, on the Upper Wye above Hay, Builth, and Rhayader, extending to the slopes of Plynlymmon. This district, with an average annual rainfall of 60 in.,—of which 30 in. would be available,—Mr. Fulton calculated would yield a supply of 393 million gallons a day for London, and give 131 million gallons a day as compensation; but in the first instance he only proposed, by the construction of six reservoirs, to bring into London 230 million gallons a day. His proposed conduit commenced near Rhayader, at a height of 590 ft. above the sea, and passing near Glasbury, Hay, Kington, Ludlow, Tinbury, Bewdley, Stourport, Bromsgrove, Henley-in-Arden, Warwick, Banbury, Tring, and Watford, to a point near Barnet, it terminated at an altitude of 276 ft. above sea-level. His estimated cost was, for 130 million gallons a day, 7,000,000*l.*, and for the remaining 100 million gallons, 2,000,000*l.*, or a total of 9,000,000*l.* for 230 million gallons daily. There can be no doubt, Mr. Binnie says, that this district yields water of great purity; its drainage areas are uncontaminated, and it was favourably reported upon by Sir Robert Rawlinson as a suitable source for the supply of Birmingham.* From some years' residence in the centre of the district, Mr. Binnie says he is able to bear testimony to the suitability of both this and the Upper Severn as sources of supply for London.

Mr. Binnie next refers to the Cumberland lakes scheme,—Thirlmere, Ullswater, and Haweswater. This scheme, he points out, was brought before the Royal Commissioners in 1867-69 by the late Mr. G. W. Hemans and Mr. Richard Hassard, who proposed to appropriate the lakes Thirlmere, Ullswater, and Haweswater, with a united gathering ground of 177 square miles, or 113,280 acres, and by embanking the lakes, to form reservoirs to contain 5,563 million cubic feet, or 34,658 million gallons. With a total annual rainfall of from 80 to 100 inches and an available 50 inches, they calculated on a supply for London of 287 million gallons daily, after giving 63 million gallons a day for compensation. The conduit starting from Ullswater would be 270 miles in length, terminating in large service reservoirs of 3,750 million gallons capacity, situated near Edgware. The total estimate for the scheme was put at 13,500,000*l.* As in the case of Mr. Bateman's Welsh scheme on the Upper Severn, so in this case also, Mr. Binnie reminds us, the practicability of the works, the suitability of the uncontaminated gathering-ground, and the consequent purity of the water, has led the City of Manchester to obtain powers for the appropriation of Thirlmere, the works being designed for them, to deliver fifty million gallons a day, by the late Mr. Bateman. These are now being carried out, including conduits over 100 miles in length, to convey the water to Manchester, by Mr. G. H. Hill.

Finally, Mr. Binnie himself directs attention to Dartmoor as a possible source of future supply the examination of which might be undertaken on behalf of the London County Council. He says he is not aware that this district has been previously suggested as a source of supply for the metropolis, but its elevation, heavy rainfall, and clean granitic gathering-ground, make it a site where good water could be obtained, and its distance from London, some 180 to 200 miles, is within reasonable limits.

Mr. Binnie adds some remarks on the advantage of gravitation works. He says that one great point in favour of any of the schemes thus briefly described is that they would bring in a supply by gravitation without pumping, and deliver it at an altitude of some 270 ft.,—that is, approximately 80 ft. above the reservoir of the West Middlesex Company near Primrose Hill, 30 ft. above the top of the Monument, 28 ft. above the top tower of Westminster Abbey, and about 240 ft. above the level of the Thames, from which the supply is now pumped. So that not only would the water be brought from Wales, Cumberland, or Dartmoor by gravitation, but delivered over almost the whole of London under constant pressure, without pumping; the only exceptions being districts immediately around the Hampstead, Highgate, and Sydenham hills, the extreme summits of which rise to altitudes of 421, 424, and 370 feet respectively. How important an expense pumping is under existing circumstances may be judged of when Mr. Binnie says he finds that the eight companies who supply London expended in 1879 a sum of over 188,000*l.*, and this was quite independent of storage, filtering, or interest on capital, and represents, at twenty years' purchase, 2,360,000*l.*; and, of course, this charge must be greater at the present time.

Mr. Binnie, in concluding his report, says he is not ignorant that there may be other schemes which may claim consideration; but he thinks that those he has named first demand attention as having been so long before the public, and as having already, in the case of the Severn and Wye, received the attention not only of engineers of the highest standing, but also such large corporate towns as Liverpool and Birmingham.

Mr. Binnie's second report is entirely devoted to the consideration of the question of compensation water.

* As we announced a fortnight ago (p. 277), the Corporation of Birmingham have now under consideration the adoption of this source for an extension of their supply.

COMPETITIONS.

Baths, Bacup.—The Baths Committee on the 13th inst. accepted the designs of Messrs. Mangnall & Littlewoods, architects, Manchester, and have also accepted tenders for the work, amounting to 7,500*l.*, presented by the late Mr. Henry Maden. The baths include first and second class swimming baths, first and second class slipper baths, and Turkish baths. The premiums were originally awarded as follows:—First, Mr. Wilson, Assistant Borough Engineer; second, Messrs. Mangnall & Littlewoods; third, Mr. Wilson, sen., Borough Engineer. But the estimates from Mr. Wilson, being unsatisfactory, were rejected by the Committee.

New Baths for Halifax.—The *Leeds Mercury* states that in the competition for new baths at Halifax the plans of Messrs. Horsfall & Williams were selected. Mr. Raymond Berry's plans were awarded the second place. Messrs. Utley & Gray were third.

A New Wesleyan Chapel for Consett.—In a recent competition for a group of buildings, comprising chapel to accommodate 1,000 persons, together with schools, lecture hall, &c., at Consett, Durham, the set of plans bearing the motto, "Comfort, Convenience, and Economy," were selected, the successful architects being Messrs. Lamb, Armstrong, & Knowles, of Newcastle.

Illustrations.

NEW MAIRIE, SURESNES, PARIS.

The new Mairie built not long since on the high ground at Suresnes, opposite the Bois de Boulogne, was gained by the architect, M. Bréasson, in a public competition in which no less than seventy-nine French architects took part.

The building includes on the ground floor all the administrative offices. A fine staircase leads to the Salles de Réception on the first floor. These rooms, three in number, have still to be decorated. The building was commenced in 1887 and completed in 1889, at a cost of 460,000 francs.

COMPETITION DESIGN FOR BATTERSEA POLYTECHNIC INSTITUTE.

The design for the Battersea Polytechnic, which is illustrated this week, is the one contributed by Messrs. Roger Smith, Son, & Gale in the final competition. It is, in accordance with the stipulated conditions, an elaboration of the preliminary design, the ground-plan of which we also publish, and has not been materially altered in any way, a few minor changes in the arrangement of certain rooms only have been made where required by the amended instructions. The perspective, indeed, has served for both stages of the competition. The building is arranged with straight and well-lighted corridors, and is planned to form a double quadrangle so as to give complete circulation and ready intercommunication between the parts, while providing for their isolation if desired. Each department on the ground floor is provided with a separate entrance, while, at the same time, every department is readily reached from the main entrance, which can be used as the only one when required. A considerable area on the ground floor is left for future extension, which can also be readily secured on the first and second floors, thus rendering it possible to extend every department should occasion arise.

The ground floor contains to the right of the entrance the administrative department, on the left the men's social department, and beyond it the women's social department, with separate entrance. The gymnasiums and bath are arranged together, near the social departments; are outside the main building, and top lighted. The shops belonging to the department of technical education form a compact block in the rear of the building, and are lighted with windows and also skylights on the saw-tooth system; each of those where bulky material may be used has an external door. The hall, which is the most important single room of the building, has not only been placed at one side of the site, where direct egress is most easily secured, but has also been brought to the front, as befits its importance. This hall, which is elliptical on plan, has been specially designed with a view to its being used for public meetings or entertainments of various kinds, as well as for the purposes of the polytechnic itself. It is, therefore, arranged to meet the requirements of the County Council, and while readily accessible from the main building when so required, can be entirely shut off from it without in any way interrupting the communication between the various parts or causing any inconvenience in its working. A tower has been provided for the large water tanks required by the County Council regulations, and ample staircase accommodation is provided.

The first floor contains the women's technical school over their social department, and portions of the men's technical department, including the music-rooms (placed also near the women's rooms), entirely isolated and sound proof, the technical library placed centrally, and the majority of the class-rooms, and one of the lecture theatres. This arrangement is specially intended to fulfil one purpose suggested for the building by the Committee, viz., that it should be used as a boys' school for general and technical education by day.

The second floor contains the art school and photographic rooms, with northern skylights, the chemical and physical laboratories, lecture theatre and class-room.

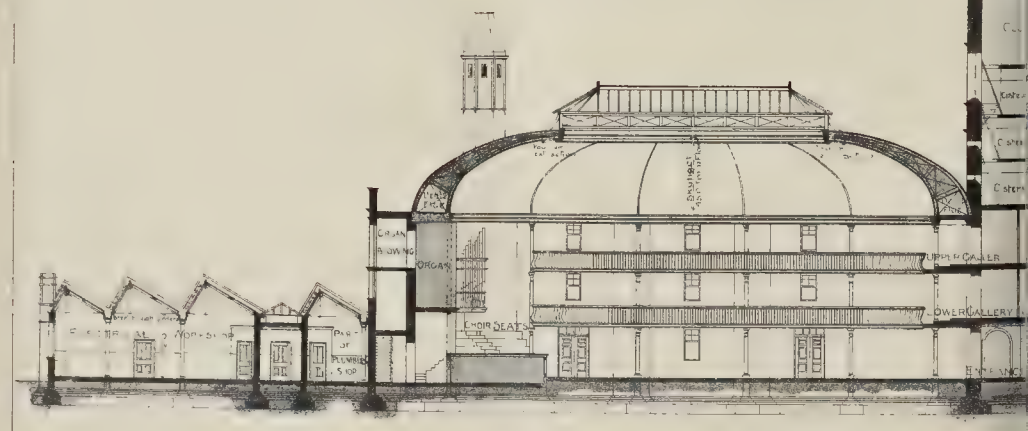
The exterior has been kept very plain by instruction of the Committee, and the authors have sought to produce architectural effect by the disposition of the masses and parts of the building, rather than by the use of ornament or decoration. The materials suggested for the exterior are stock and red brick and terra-cotta, with tiled roofs to the main block, and slated roofs to the brick buildings. A system of artificial ventilation, as well as a very thorough natural ventilation is provided, and the heating is arranged to be by hot water. The estimated cost of the building is 39,850*l.* R. S. and G.

THE BAUDRY MONUMENT, PÈRE-LA-CHAISE, PARIS.

This monument to Paul Baudry, the painter (best known to Englishmen by his decorative paintings in the Paris Opera House), is a fine example of the artistic spirit in which the French carry out monuments of this kind. They do not go to a commercial producer of cemetery monuments, but get the best artistic power they can to bear upon the work. In this case the general architectural design is by M. Ambroise Baudry, a relative of the deceased painter; the bust by M. Paul Dubois, and the two figures by M. Mercié, one of the greatest sculptors of the day. The fine and truly sculpturesque manner in which the figure at the foot of the monument is indicated under the drapery is especially noticeable. The inscription consists merely of the simple words, "A Paul Baudry ses admirateurs et ses amis;" nothing could be in better taste.



SOUTH



SECTION G-H.



ELEVATION.

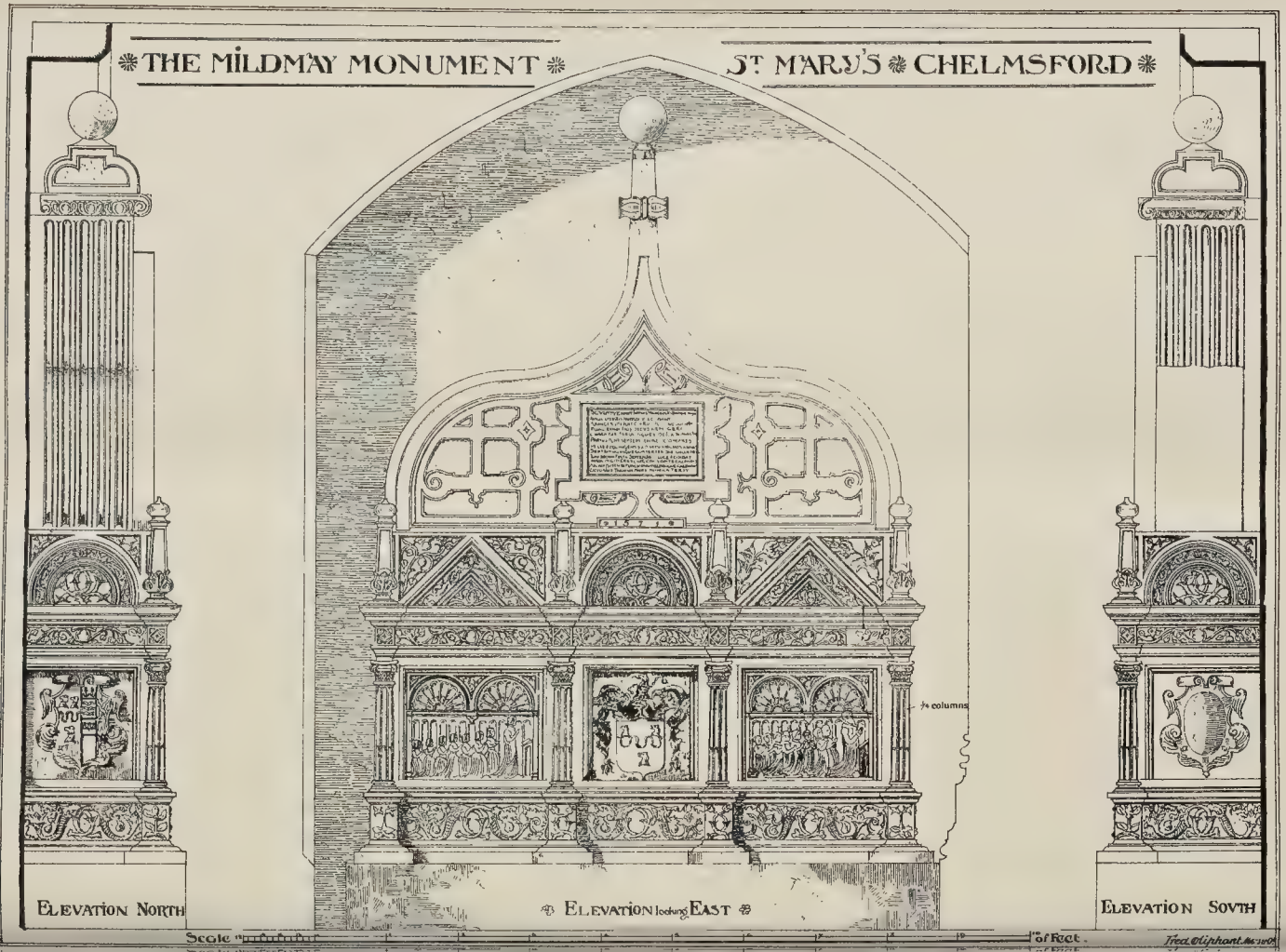
FEET



SECTION C-D.

PHOTO-LITHO BERLIN & N.W. MASS. REC'D AUG 1891 LONDON E.C.

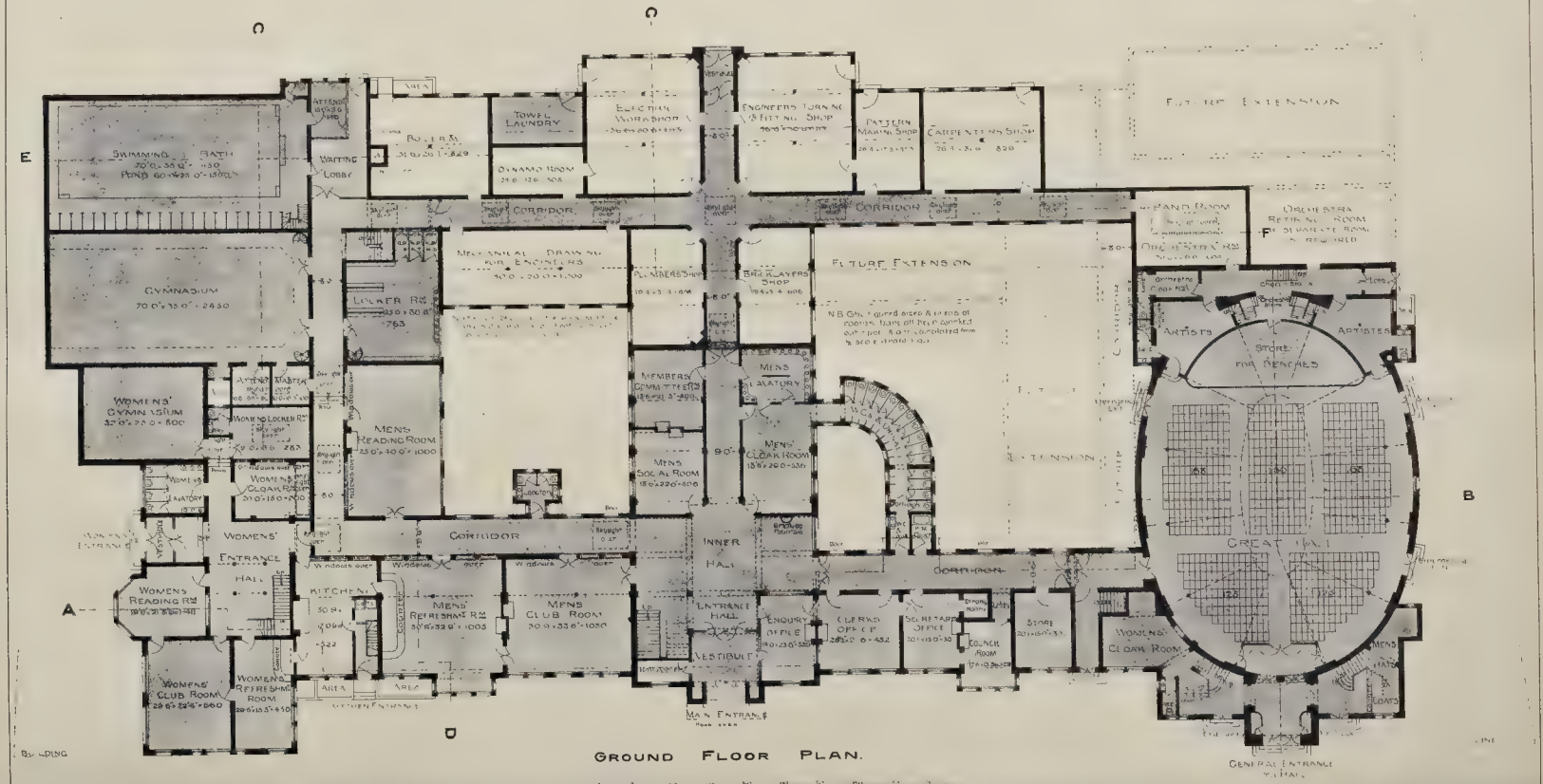
IGN SUBMITTED BY MESSRS. ROGER SMITH & GALE.


THE MILDMAY MONUMENT
ST MARY'S CHELMSFORD
¾ columns
ELEVATION NORTH
ELEVATION looking EAST
ELEVATION SOUTH
Scale
1" of Feet
Fred Oliphant Archt

BATTERSEA POLYTECHNIC INSTITUTE.

FINAL COMPETITION

DESIGN SUBMITTED BY MESSRS. ROGER SMITH & GALE.



GROUND FLOOR PLAN.



MONUMENT TO BAUDRY, PÈRE-LA-CHAISE, PARIS.

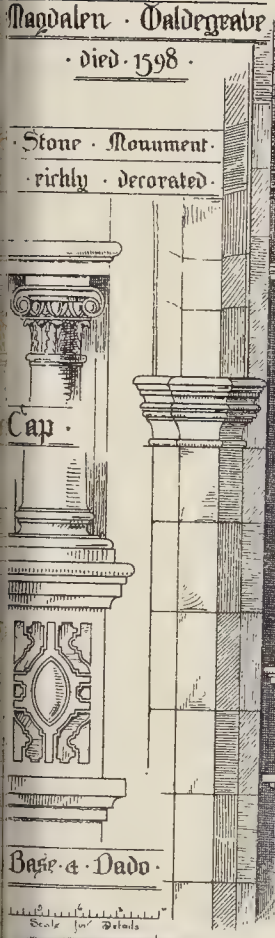
THE GENERAL DESIGN BY M. AMBROISE BAUDRY, THE BUST BY M PAUL DUBOIS;
THE FIGURES BY M. MERCIÉ.

The Waldegrave Monument

Borley Church

Magdalen Waldegreave
died 1598

Stone Monument
richly decorated



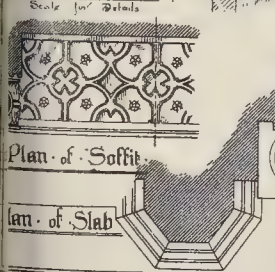


Elevation on N. wall of Chancel



Shield on top





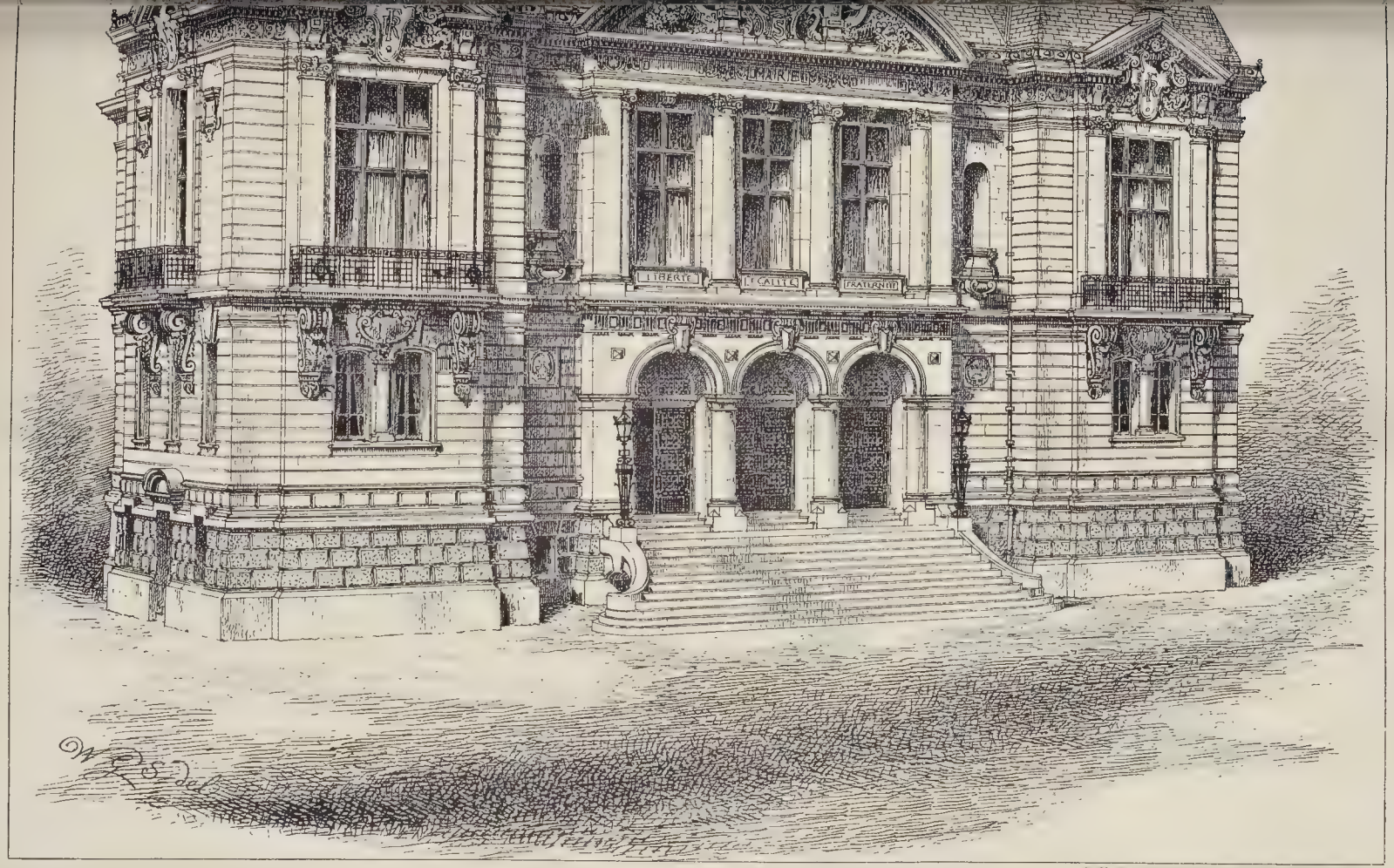
Scale of Feet

0 1 2 3 4 5 6

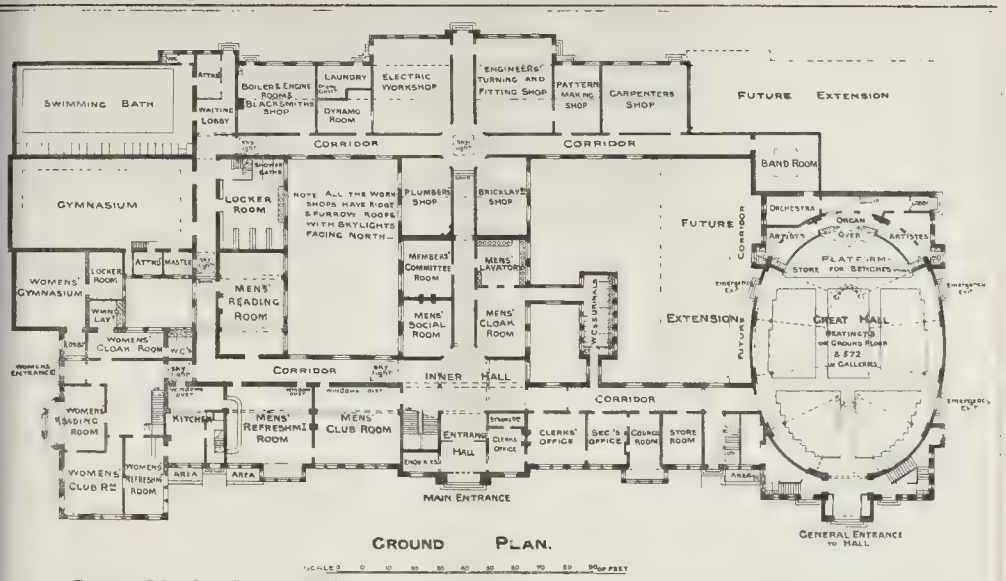
Frank Brown

PHOTO LITHO BIRACLE & CO 22 MARTINS LANE CANNON ST. LONDON E.C.





THE NEW MAIRIE, SURESNES, PARIS.—M. Bréasson, Architect



Battersea Polytechnic Competition.—Original Sketch Plan submitted by Messrs. Roger Smith & Gale in the first competition.

MILDMAY MONUMENT AND WALDEGRAVE MONUMENT.

THE two plates illustrating these monuments are reproduced (to considerably smaller scale) from M. Frederic Chancellor's work on Monuments in Essex Churches, a notice of which appears in another column.

THE LATE MR. JOHN DRAYTON WYATT.

BY the death of Mr. John Drayton Wyatt, which occurred on February 22 last, the architectural profession lost one of its best draughtsmen and most earnest workers. Mr. Wyatt was born at the old Manor House, Nailsworth, in Gloucestershire, on December 11, 1820, and was the descendant of two old Gloucestershire families, the Wyatts and the Draytons, who had for many generations been resident in the county. His mother was a descendant of Michael Drayton, who appears to have been Poet Laureate in the time of Queen Elizabeth, and also of Sir John Box, who was a distinguished citizen of Gloucester, and Mayor of that city in successive years. He was brought to London by his father, Dr. Peter Wyatt, a prominent sanitarian in his day, and one of the first who protested against intra-mural interments, and who commenced medical practice in Islington in 1827. From his earliest youth John Drayton Wyatt showed great abilities, especially in drawing, in which he excelled at University College School, where his education was completed. This induced his parents to select architecture as his profession, and in 1837 he was articled to Mr. H. W. Inwood for three years, before the expiration of which term he prepared the requisite drawings for "probationership" for the Royal Academy, and ultimately became a student. He always retained his interest in the Royal Academy, and, unless prevented by unavoidable circumstances, was a regular attendant on the annual prize nights.

In May, 1841, Mr. Wyatt obtained an engagement as an assistant-draughtsman in the office of Messrs. Scott and Moffat, of Spring-gardens, and on the dissolution of partnership, remained with Mr. (afterwards Sir Gilbert) Scott, and became one of his principal assistants. He was a great favourite with Sir Gilbert, who so keenly appreciated his rapid method of preparing accurate detail drawings, that whenever a push occurred and details were required to be done hurriedly before post time, they were always sent up to Mr. Wyatt. During these days he was known as "Scott's Wyatt," a *sobriquet* to distinguish him from Matthew and Digby Wyatt.

During the period he was with Sir G. Scott Mr. Wyatt prepared most of the drawings of executed works for illustration: a far more difficult matter then than at present, and often extending to actual drawing on the lithographic stones. Probably his large practice in this class of work led to his being such a very fine architectural draughtsman. In perspectives for illustration he may be said to have been unequalled. His style closely resembled that of the late George Hawkins, who died about forty years ago, and who was, in his time, considered by many the leading perspective draughtsman.

Mr. Wyatt also made an elaborate measured drawing of St. Michael's Tower, Coventry, every dimension for which was taken by himself at considerable risk; in fact, the whole was a personal work, and occupied many months of labour in execution. Having been conducted when the decay, although considerably advanced, had not gone so far as to obliterate mouldings and ornamentation, his dimensions were of the greatest use in enabling the tower to be restored. In 1842 he assisted in the formation of the British Association of Architectural Draughtsmen, which, in 1848, became the Architectural Association, of which he was President in the years 1850-1-2, and was presented with an elaborate box of instruments, as a token of the regard his fellow members had for him. These, however, he always looked upon as too good for everyday use, and all his life he used the same little case of instruments, measuring about 4½ in. by 3 in. that he had when a pupil. Mr. Wyatt was appointed Diocesan Architect by the present Bishop of Bath and Wells when Archdeacon, and in 1867, having for a considerable period devoted much of his time to private work, he finally relinquished his work for Sir Gilbert Scott, and only undertook his own practice, which was chiefly connected with ecclesiastical buildings. He restored St. John's, Wolverhampton, designed and superintended Christ Church, Gretton, of which the erection was mainly due to the munificence of Mrs. Dent, of Sudeley Castle; and executed many other works in the neighbourhood; but the work he loved most was the restoration of Sudeley Castle, in which, associated with Sir Gilbert Scott, and independently, he was engaged for thirty-five years, the work having been still in progress at the time of his decease. His works in the neighbourhood of Sudeley Castle are enumerated in a memorial tablet in the chapel, the inscription on which, considering the historical and antiquarian importance of the Castle, it may not be out of place to quote here, as follows:—

"The following works in this locality were carried out from the designs and under the superintendence of Sir Gilbert Scott, R.A., and J. Drayton Wyatt, architects, London:—

The restoration of the church (1863) and of the buildings on the west side of the lower quadrangle (1867); also in Winchcombe the erections of Dent's School; School House (1867) and Almshouses (1865).

The following works were carried out from the designs and under the superintendence of the above J. Drayton Wyatt:—

The erection of Christ Church in the hamlet of Gretton (1868); the restoration of the parish church of Winchcombe (1872); the restoration and enlargement of the Jacobite House (1879); the rebuilding of the 'Three Gables' in Gloucester-street (1882), and of the Pilgrims' Gallery at the George Inn (1884); the conversion of the Wesleyan Chapel into school buildings (1886); the new west gateway to Sudeley Castle, with the adjoining buildings, and the entrance-lodge, in the Jubilee year of Queen Victoria's reign (1887); in the same Jubilee year, the restoration of the Conduit-house of St. Kenelm's Well, in commemoration of the water being then conveyed to Winchcombe."

An accomplished architect and antiquary, Mr. Wyatt passed a busy, useful life, of which not a day was ever wasted. His art was his delight, and he succeeded in infusing great interest in their work in the workmen engaged on his buildings, who became greatly attached to him; while in social life his genial temperament and never-failing good humour endeared him to all his friends, by whom his loss will long be mourned. O. C. W.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary fortnightly meeting of this Association was held on Friday, the 10th inst., at 9, Conduit-street, Mr. Leonard Stokes, President, in the chair.

Mr. F. R. Farrow, Hon. Secretary, announced that Mr. Edmund Woodthorpe had given a number of volumes of the *Builder* to the Association for the Reference Library. A vote of thanks was accorded to the donor.

Mr. Earle announced that a photographic club was being formed in connexion with the Junior Sketching and Measuring Class.

The President referred with satisfaction to the fact that the list of members wishing to subscribe a guinea a year instead of half-a-guinea, now reached 100 names. Upon this,

A member, whose name did not transpire, asked what really was the rule as to the amount of the subscription? He was under the impression that the rule said that the subscription should be half-a-guinea per annum, and it appeared to him that members of the Association were breaking the rule by paying a guinea, unless they gave the extra half guinea in form of a donation.

The President said that the extra half guinea was really given in the form of a donation.

Mr. Farrow then, in accordance with the rule appertaining thereto, brought forward the Committee's list of officers and committee for the ensuing session. This, he explained, was only the list of gentlemen whom the Committee had ascertained were willing to serve, but it was open to the members to nominate other gentlemen to serve as officers or on the committee. (We may mention here that in this list Mr. F. T. Baggallay is nominated as President.)

Death of Mr. J. D. Sedding.

The President said:—It is now my lot, gentlemen, to have to perform the most painful duty that I have had to discharge from this chair during my term of office. I dare say several of you are already acquainted with the sad fact to which I am alluding, but at the same time I have to announce it formally from the chair, and I wish you to express your regret, as I am sure you will,—when you hear that our friend and member, Mr. J. D. Sedding, died within the last few days. Everybody who has known Mr. Sedding, as I have had the honour of knowing him, will bear testimony from their hearts that they never knew a more genial man, that they never knew a man more enthusiastic for his art, and that they never knew a more thoroughly artistic and capable architect. Gentlemen, it is a great loss to this Association that we have just sustained. Mr. Sedding was always very keenly alive to the interests of this Association; and he was always willing to help us in every way that he could. We all thoroughly and heartily regret his loss, and we propose to send a letter of condolence to Mrs. Sedding in the name of the Association.

Notes of the Travelling Student.

Mr. Percy D. Smith, holder of the A. A. Travelling Studentship 1890-91, then read the following notes of his tour in the West of England.

It is my pleasurable duty to commence the description of my tour this evening by thanking you sincerely for awarding me the Travelling Studentship for the past year, and I trust that you will find my work a sufficient justification for your award.

On reading the late Mr. Street's papers, published in the Royal Institute of British Architects' "Transactions" last April, I was struck with a pithy finish to one of them: "That he learnt his art by tramping through the country, with knapsack on back, and studying anything and everything that came under his observation." Therefore, I determined to follow the great master's steps, and "go and do likewise," but in a more modern spirit, viz., with the aid of the bicycle. I found several difficulties; first, the transport of baggage; second, the selection of the most suitable route; and lastly, in my work. You will perhaps notice that all my sketches are rather small in scale, necessitated by the difficulty of carrying on the machine anything larger than a quarter imperial board, the measured work I show having been worked out from my measurements and sketches on my return to town. Before starting my tour proper, I had a preliminary week in the Witney district, with a friend, visiting Fairford, to which place I paid a longer visit on my return journey, also visiting Down Ampney (measuring the church porch). The old manor there, originally built by the Hungerford family, is now very much modernised, and, though the Henry VII.'s entrance lodge and gate is an excellent building, it has little charm for the architectural student, being so covered up with ivy. After visiting Bibury and Burford, and several villages in the district of little interest, I finished up with a day at Minster Lovell, just the day previous to the Excursion visit there, measuring the porch and ante-room on the north side of the great hall.

My tour proper commenced on August 25, when, starting from Bourton Hill as my headquarters, I went to Chipping Campden, and made a sketch of the almshouses; and bad weather having driven me into the church, I made a measured sketch of the seventeenth-century pulpit. This venerable three-decker I heard had been cut down to its present height to suit the late parson, who, I understand, was of exceeding short stature.

The church has been restored (with a query) rather too lavishly by sweeping away all the old oak benches which were finely and wondrously wrought with the arms of the patrons of early days (cloth merchants generally), and substituting pitch-pine seats of a uniform height; and, to add to the bizarre effect internally, all the stone joints (rubble walling) have been picked out with black joints on a very white ground, giving a curious cobwebby effect, relieved, however, by the arches being pointed in white, so as to look as if formed of a single stone.

I then measured the garden pavilion at Campden House, to which I will refer later. At Campden I was able to make a sheet of good "bits" (the sun-dial there being especially notable). I can thoroughly recommend the place for a week's good study. Bicycling through Subedge, Willersey, and Saintbury, a district where one finds in profusion the good old quiet and simple "lintel and mullion" style of work, entirely devoid of any pretentious confectionery adornments, simple and massive, one can learn a few useful hints. On leaving Gloucestershire I arrived at the village of Broadway in Worcestershire, which nestles in a lovely valley at the foot of one of the steepest hills in England. It is "a favourite resort of artists, architects, and Americans," to quote the Guide-book, and no wonder, for it is a very picturesque village under the Cotswold Hills. I stopped at the "Lygon Arms," an ancient hostelry with oak-panelled rooms and staircases, modelled plaster ceilings, and large stone mantels,—in fact, a perfect museum for an architectural student. Saturday, August 30, was spent in an excellent coach drive to Cheltenham and back. There being nothing in Cheltenham to interest me, I took the train to Gloucester for a preliminary look round, and to present a letter of introduction, and returned to Cheltenham just in time to catch the coach back to Broadway, which I left on Sunday, trundling through Child's Wickham and Hinton, arriving at Evesham, where there are two churches within the same churchyard, a path only dividing the two parishes of All Saints' and St. Lawrence. The Perpendicular vaulted baptistery adjoining the south aisle in All Saints' Church is much too good for the font.

The half-timbered work here is rather quaint and good, and I noticed the oak door-frames in this town wrought out of 6 in. by 5 in., with a simple deep moulding terminating in a stop at the bottom, which really puts our modern architrave out of 4 in. by $1\frac{1}{2}$ in. to the blush. Supposing this 4 in. by $1\frac{1}{2}$ in. were added to the 4 in. by 3 in. posts, and had a decent moulding worked on the solid instead of the wretched flat and sprawling arrangement of grounds, &c., I should be quite happy about it. There is ample room here for improvement at little or no more cost.

A chimney and an old gateway is all that now remains of the monastery destroyed by Cromwell.

Passing on through Cropthorne and Wycke Chapel we get entirely out of the stone district and find chiefly the half-timber work which I have illustrated by a few wayside notes. I halted at Pershore for a repair to my steed and for a look at the vaulted church which is formed of the choir and part of the crux, the only remaining portions of a fine Early English monastery chapel. The lantern tower at the west end (a restoration, I believe), is very clever. From Pershore I went through some hop country to Norton, which looked very inviting on the map but only boasts a "Jubilee" church and a barracks; so improving my pace to compensate for the fruitless divergence, I raced into Worcester for a week's sojourn. I may here mention that my work there is hardly a typical week's work, owing to an odd visit or two to the cathedral for the Musical Festival. My chief work here, however, was at the Commandery,—tenanted as a printing office by Mr. Littlebury, an architectural enthusiast, who kindly gave me the free run of the place and every facility for working there. The glass is curious. It is in two colours, brown and yellow only, the birds being drawn with much spirit, though conventionalised. I measured while there the staircase and bench-end.

My next stop was at Tewkesbury. I originally intended to go to Ledbury, to see our old friend the Market-house there; but the hot weather and the journey across the Malvern Hills and back,—well, I didn't. Uninteresting as was my seventeen miles ride to Tewkesbury, I was amply repaid by the good sights there. It is a pity they don't put a door in the old cloister archway, instead of leaving it blocked up, and so give students a chance of seeing more of it. Sir Chas. Barry made a replica of it, however, in the Peer's doorway in the Parliament houses; but, of course, one prefers studying the original article.

Since my visit, I hear that Mr. Collins, a well-known local builder, who restored the church and half the town, has undertaken to restore this door and archway at his own expense, under the direction of Mr. Scott.

En route to Gloucester I tried Deerhurst, and was disappointed with the church, a divergence of four miles just to see this fine modern Saxon church, with a triangular head in the tower. I really expected to see more after all we read in "Parker."

At Gloucester, my introduction to Mr. Waller, the Diocesan Surveyor, obtained for me his kindly assistance and *entrée* everywhere in the Cathedral. I measured the fifteenth-century sedilia in the Lady Chapel, and took a few other notes in the cathedral and town. While here I visited the late Mr. Gambier Parry's beautiful church, situate a mile out of the city, at Highnam. It is well worth a visit, but I am sorry to say that the lovely painting there is denied to the sketcher. Another seventeen miles to Cirencester, and at the top of Birlip Hill, we run into the stone country again. [Query. Why are the Roman roads so awfully uninteresting?] Not a single village for seventeen miles, until Cirencester is reached. I stopped at Cirencester for the night, had a look round the church, and left at once to visit Fairford again.

The church here, we learn, was commenced in 1493 by John Tame, whose monument I sketched. He is recorded to have taken a vessel bound from a Flemish port to Italy, laden with painted glass, when he conceived the idea of building a church to take it. He chose Fairford, where he had come to live, and, dying in 1500, the work was completed by his son. The windows are ascribed to Dürer, and they certainly look like his style. The whole of the glass has been taken out and re-leaded throughout, and the missing portions restored with stippled glass. More restoration of this sort would be welcome. The glass is stippled up just to show the form of, say, a face or a limb, with no attempt at drawing it again, and not, as I have seen in some churches, — nay, a good many, where the enterprising vicar or rector had taken the least dilapidated window in his church, stuck it up in one of the most prominent openings, and crammed, in a higgledy-piggledy way into all the missing spaces in the composition, with no regard to fitness, all the lesser portions and bits from the other more dilapidated windows, and then refer to it blandly as "the most ancient window we have in the church." My last day at Fairford completed a five weeks' tour, and, funds getting short, I started for Bourton Hill, my headquarters, by Sherborne, Clapton, and Stow-on-the-Wold, where I made the sketch of the interesting old stocks still preserved there, as such things are, alas! fast disappearing all over the country. I carefully avoided the direct Roman-road to Stow, and preferred to see the villages of Sherborne and Clapton, though I somewhat repented it because of the heavy work on the bridle-road as compared to the genuine Roman article.

To conclude, I will just refer to a few notes I have made in my study of Campden House. Few mansions have had a fuller series of possessors than what are enumerated of Campden, by Sir Robert Atkyns. Of these, the principal were the great Barons de Somesi, Clare de Audley, and Stafford. Queen Elizabeth found it vested in the Crown, and granted it to the family of Smith, of whom it was purchased, in 1628, by the famous Sir Baptiste Hickes, Viscount Campden. Upon his purchase of the manor, Sir Baptiste built a most sumptuous mansion, with accompaniments of corresponding magnificence, which was destroyed by fire, during the Civil Wars, by command of Baptiste Hickes, Lord Noel, grandson of Sir Baptiste, that it might not be seized by the Parliament. I quote from the inscription on his tomb:—

"His eminent loyalty for King Charles, notwithstanding his inestimable losses in his Estate, Spoil and Havoc of several of his Houses, besides the burning of that noble pile of Campden," &c.

This very disinterested conduct proved in the sequel quite unnecessary, as the enemy approached not nearer than Evesham and Warwick.

I read that the "noble pile" was enriched with friezes and entablatures most profusely sculptured, and reported to have cost £23,000, and part of a wall discoloured by fire and the two banqueting houses which terminated the terrace, are the only remains worthy of notice. I also gather from another source that the founder employed "the most eminent architect that age afforded," but his name is not known. The alms houses and market-place which he gave to the town are characterised by similarity of style.

The east pavilion or banqueting house, which I measured, has been "restored," that is to say,

has been denuded almost entirely of work that might have been repaired.

In my drawings I have endeavoured to replace work from parts remaining (though in a decayed state) in the west pavilion. I conjecture that these pavilions were intended to have coved roofs, if they were not actually constructed. The plaster frieze and cornice remaining in the western pavilion actually show the starting of the cove ceiling, though whether this was intended to be painted or decorated with panels or embossed cast work, nothing remains to explain. Certain it is, however, that these pavilions were never completed, as may be concluded from some of the unfinished carving and moulding left, so perhaps the coved ceiling was never made.

The construction of the roof I think also decides that a cove was intended. To further this idea of non-completion, I may mention that the chimney-flues and openings have no fire-stains, evidently showing it was not occupied as a habitation for mankind, though that it has been, and is still, a habitation for cows I am sorry to say is plainly evident. This Campden House is doubly interesting to the student, inasmuch as it seems to have been partly destroyed soon after its erection, and no endeavour has ever been made to render it once more habitable. It is curious to notice the moulding of the panelling. The first rail from the floor being much deeper than the rest, and the moulding next below being omitted, the side mouldings are there as usual. Was this moulding omitted because a seat had been fixed just above it? in which case the moulding, if put there, would be hidden. Twenty inches from the floor, however, seems rather high according to our modern notions of comfort. I should like to get some indisputable heights of early seats, as our modern copies of them very low, and measurements of antique furniture must be taken *cum grano salis*, considering that the feet of chairs, &c., are always the first to get decayed, and are generally cut down as they get rickety with age and usage perhaps, however, in this case the seat was raised higher than usual, so as to afford a view from the window when the "viewer" was seated, the sill (glass line) being 3 ft. 9 in. high. It is curious to note how the centres of the gables are out of centre with the windows below them on the east side. They have been made to centre with the arch piers on the west, or terrace side.

And now, one more note, as to the ways and means of the studentship, which may be of some use to intending competitors. I sincerely hope the prize committee will not take what I am about to say as ingratitude on my part. This is furthermost from my intentions. Two years back I was seized with a desire to get the studentship, and I was rash enough to get up and ask the student then reading his paper, how the thing was done. A laugh was distinctly audible. Anyway, the information received, made it look tolerably easy and I tried for the studentship, and was rewarded on both occasions. Now, I don't want to disparage aspirants to this Association honour, but I must say with the poet, Pope:—

> Who pants for glory, finds but short repose;
> A breath revives him or a breath o'erthrows.

"Glory" is the sum-total of the reward—after expenses are paid. As a speculation, it is a bad financial investment, so don't attempt it on these lines.

Twice it has been my happy experience to succeed in the competition for the Studentship prizes, but what about the cost? My first attempt involved a two months' stay at Chichester, and a week sketching at Cambridge and Ely. "Include for travelling, labour, and materials." My second involved six weeks' sketching in France, and two months' measuring at Christchurch, Hants. Result, the Studentship—grand total, £25; expenditure, nearly £50! Possibly, when the contemplated increase in the amount of the subscription to our Association is an accomplished fact, of course which I for one respectfully support, the financial inducement to competitors for the Studentship will be also increased. I would venture to suggest also whether students should not be encouraged to study architecture rather than mere expertness in draughtmanship. Whilst venturing, Mr. Chairman and gentlemen of the Committee, to criticise the financial results of my success in this competition, permit me to express my high appreciation of the honour your decision has conferred upon me, and of the great benefit I have experienced in the labour undertaken; the professional knowledge gained by me in this competition has been such as will serve me through life, and this alone, at whatever cost, is worth the struggle.

Mr. W. J. N. Millard said he had much pleasure in proposing a vote of thanks to Mr. Percy Smith for his paper. He was particularly in sympathy with him in his concluding remarks. There was no doubt that a great deal of unnecessary work was done by the competitors for this studentship, especially in regard to the inking-in of drawings, and so on. One competitor did it because another one did it, and not because it was particularly useful. It was the competitors themselves who set the standard, and it was difficult to see how such work was to be avoided unless the Committee laid down the law that there should be no ink drawings—that drawings should be in pencil only. He also agreed with Mr. Smith in his last remark, which contained the kernel of the whole matter. It was not to pay his expenses that a competitor entered this competition; it was for the sake of getting a knowledge that would be useful to him throughout life. Supposing it *did* cost 50*l.* to obtain the studentship; the competition for it was only one means of education. He supposed that money paid for a young architect's education paid expenses out of doors as well as indoors, and he thought it would be a good thing if parents and guardians could be induced to spend on out-door work some of the money which they now appropriated entirely to indoor work; in other words, he thought it would be desirable if architectural pupils spent more time in studying their art from actual buildings, instead of from books or office work. But, curiously enough, it was a minority of architectural students who went that way to work to learn their art. To study architecture from existing buildings, it was not necessary to be able to make pretty sketches. The student could learn much from old buildings, even if he made the roughest working drawings showing all details of construction. He cordially agreed with what Mr. Smith had said as to the usefulness of keeping one's eyes open in travelling through the country; for by so doing there was an infinite amount to be learnt,—not only about architecture, but about other things.

Mr. T. E. Pryce said it afforded him much pleasure to second the vote of thanks, although he did not know that there was much to object to in the comparatively small value of the studentship; at any rate, he did not think that the Association was in a position to increase its pecuniary value very much. He thought that all architectural students' competitions consisted, not merely in the money gained, but in the amount of knowledge gained in competing for them. With regard to Worcester Cathedral, the portions of the work which struck him the most there were the cloisters. Mr. Smith had mentioned that Sir Charles Barry had taken one of the doorways there as his model for the entrance to the House of Lords, and it often struck him (the speaker) that Sir Charles had obtained inspiration for the Victoria Tower of the House of Lords from the central tower of Gloucester Cathedral. With regard to the Commandery at Worcester, he had always understood that it was one of the houses of the Knights of St. John. The old building had been terribly knocked about, but was exceedingly interesting. With regard to the destruction of Campden House, he did not think that that was the only mansion which was destroyed by the Royalists "off their own bat," so to speak. Mr. Smith seemed to have had a very successful trip, and he congratulated him very much upon the collection of drawings which he had brought back.

Mr. W. J. H. Leverton, in supporting the vote of thanks, said he thought it was an important thing to consider in what spirit old work could be studied. He thought there was too much blind admiration for things that were old, because they were old. A great many people seemed to think that all that was old was good and that all that was new was bad, or at any rate unworthy of study; that was, of course, erroneous. He thought that when one proceeded to study a building, whether it was old or new, one should admire it or condemn it for its excellences or defects in proportion, mouldings, details, &c. Above all, it was especially necessary for the student to notice the methods of construction.

Mr. F. T. Baggallay said he had much pleasure in supporting the vote of thanks, especially as he knew something of the part of the country which had been traversed by Mr. Smith. He agreed with what had been said as to the money-value of the studentship. That was not the light in which to regard it. Probably no studentship that was worth winning, —not even those of the Academy and the Institute,—paid from the point of view of pecuniary outlay. He did not quite understand what Mr. Smith meant by speaking of the glass used in the restoration of the Fairford windows as being "stippled."

The Chairman, in putting the motion to the meeting, said he thought Mr. Smith had made a very excellent choice of route. He had been to some very interesting places and seen some exceedingly interesting buildings; but he (the President) should like to see students not running quite so much after what they called "bits," but rather studying whole buildings more than they did. It would in many cases, he was quite sure, be much more instructive to try to grasp one building as a whole, than to run about collecting a little bit of detail from one and a little bit from another. Of course, in a very large building, such as a cathedral, it would not always be possible to do this. Another thing he would say was that students on sketching tours should not make it their primary object to bring back a lot of pretty sketches to show their friends; he quite agreed with what Mr. Millard had said on that head. Excellent as such tours were for gaining a knowledge of one's art, it must not be too hastily assumed that the man who had succeeded in gaining a travelling studentship was thereby rendered a perfect architect. A true architect was always studying and always learning.

The vote of thanks having been carried with much applause,

Mr. Percy D. Smith, in reply, said that as to the glass in the Fairford windows, when looked at from a distance its general tone was that of a curious yellowish brown. Where pieces had been inserted to fill up gaps in the original glass, they had not been elaborately painted in imitation of the old work, but just stippled up here and there so as to indicate the continuation of a limb or other missing part of the picture. As to his choice of route, he chose it because he thought it would be a good one, and because it seemed to contain a pretty good list of places within a tolerably limited circle of area. He had no predilection in favour of that district, and, indeed, had some difficulty in knowing what district to choose; and he thought that the Association might do something for students in the way of indicating to them good districts for their student tours. As to his remarks about the pecuniary aspect of the studentship, he thought his intention had been somewhat mistaken; he himself had no complaint to make in the matter, because he felt that the benefits which he had derived from the studentship were very great, but he knew that there were many members of the Association who did and were obliged to look at the pecuniary side of the question, and that many of them were deterred from competing. Moreover, he thought the standard of work required in the competition for the studentship was too high.

The meeting then terminated.

Advanced Class of Construction and Practice.—At the meeting of this class, held on Wednesday last, Mr. S. B. Beale read a paper on "Fireproof Floors and their Theory of Strength." Mr. Mark Fawcett, an old member of the class, attended, and made some useful remarks.

Birmingham Students of the Institution of Civil Engineers.—At the annual general meeting of the Association of Birmingham Students of the Institution of Civil Engineers, Mr. J. Edward Willcox, A.M.I.C.E., was elected president for the ensuing year, the past president being Mr. Edward Pritchard, M.I.C.E., and the vice-presidents Messrs. W. Till, M.I.C.E., J. W. Gray, M.I.C.E., C. Hunt, M.I.E., and R. Godfrey, A.M.I.C.E., the hon. secretary, Mr. H. K. Woodward, Student, I.C.E.

Land at East Ham.—Messrs. E. E. Croucher & Co. announce in our advertisement columns the sale of the second portion of the East Ham Estate, on Tuesday, April 28, at half past seven in the evening. Messrs. Croucher & Co. held a successful sale of the first portion at the latter end of February, and have, we hear, since sold a large portion of the estate by private treaty.

THE ARCHITECTURAL ASSOCIATION VISITS:

CHURCHES AT KENSINGTON AND HAMMERSMITH.

THE Church of St. John the Baptist, Holland-road, Kensington, which is now being completed from the designs of Mr. James Brooks, was visited on Saturday afternoon last by a large number of members of the Architectural Association. By the special arrangement of the architect, the vaults of the four bays of the nave, which are in progress, were so left as to completely demonstrate the art of vaulting in stone. The western bay showed the diagonal ribs only; the next bay the first courses of the filling in; the adjacent bay the filling carried almost to the crown; and the fourth bay showed the complete vault. Needless to say that this arrangement excited the interest of all, and must have proved of great educational value to many of the younger members whose opportunities of studying vaulting in progress have been few.

The church consists of nave, with side aisles in four bays, all of which are vaulted. The chancel has two bays and semi-circular apsidal termination. The church is entirely built of stone, Bath stone being used in the interior, whilst the exterior is executed in Ancaster stone. A large western tower was originally provided in the design, but this has been abolished, and three deeply-recessed doorways will occupy the western front.

A further visit was made to the Church of the Holy Innocents, Hammersmith, a portion of which has lately been completed from Mr. Brooks's designs. The boundaries of the site upon which this church stands are very irregular, and a special plan has been originated by the architect to meet these requirements by making double transepts and abolishing the side aisles. This arrangement is capitally adapted for its purpose, and is most successfully treated. Mr. Brooks's courtesy in meeting the party and explaining all points of interest made the visits a great success.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon last, the Chairman, Sir John Lubbock, presiding.

Tenders.—Tenders for paving, &c., in Rosebery-avenue (the new thoroughfare from Holborn to Islington), and for sewerage-works in Mitcham-lane, Streatham, were opened, and referred to committees for consideration. The lists will be found under our heading "Tenders."

Finance.—In the course of a discussion arising out of one of the recommendations of the Finance Committee, it was announced that the Local Government Board's audit of the Council's accounts for the year 1888-89 was not yet complete! In other words, the Council was now in its third year of existence, and its first year's accounts had not yet been audited! Several members spoke in strong terms of this unsatisfactory state of things, which they condemned as a public scandal, and made the delay the excuse for some sarcasms at the expense of the Local Government Board, who are stated to be responsible for this delay, and who, it seems, are now seeking to obtain "a certain supervision and control over the Council's proceedings in connexion with capital expenditure,"—a proposal which is strongly resented by some members of the Council as an interference with the principle of local self-government.

Selling or Letting Land.—The adjourned report of the Housing of the Working Classes Committee, dated February 16, was as follows:

1. "The Council on January 27 made the following references to your Committee:—

'(*a*) To report upon the advisability of selling land, to be acquired under the Housing of the Working Classes Act, 1890, at reasonable prices, or leasing the same to suitable tenants at low ground-rents, so far as such land may be required for re-housing the working-classes, rather than that the Council itself should undertake building operations.

(*b*) To reconsider and report as to the reasonably restrictive covenants to be imposed in such letting or selling, with regard to construction and elevation of buildings, cubical contents of rooms, rent of tenements, and any other matters of first importance.

(*c*) To consider and report upon the propriety of selling or letting at low figures, with the restrictive covenants, suitable land already in possession of the Council in other parts of London, for the purpose of making provision for an equivalent to the tenants to be displaced by the clearance of any land under the Housing of the Working Classes Act, 1890.'

With regard to (*a*), your Committee understand this reference as raising the question of the advisability of the Council building, where building is required, for rehousing the working classes in preference to letting or selling to others to build. It will be convenient to explain shortly the powers of the Council in this respect under the Housing of the Working Classes Act, 1890.

(i.) Where clearance or reconstruction schemes are effected by the Council, whether under Part I. or Part II. of the Act, the Council may sell or let the area cleared or acquired with a view to the carrying out of the scheme, and in so selling or letting may attach conditions as to maintenance of the state and character of buildings. The Council is also authorised to arrange for any society or individual to carry out the scheme upon any terms the Council think expedient, whether as to rent or otherwise. If the Council should itself wish to build, it can only do so with the express consent of the Secretary of State, and a further consent is required to a retention of buildings when erected beyond 10 years (see sections 12 and 39 (8).

(ii.) The Council is authorised (see section 23 of Act) in connexion with an improvement scheme under Part I., and where further accommodation is required for the persons displaced, to appropriate any other land it may happen to have available for the purpose, or to purchase by agreement other land required. Where this power is exercised, it would appear that, with the consent of the Home Secretary, the Council can, if it so desire, instead of selling or letting for building, apply the powers given by Part III. of the Act and itself erect dwellings (see section 57 (3) and section 59 of the Act).

(iii.) Under Part III. of the Act (section 56 and following sections) the Council has authority to purchase land inside or outside the county, and to build thereon, furnish and let for occupation, houses or cottages for the working classes, and if cottages, gardens not exceeding half an acre may be allotted; if the purchase is by agreement no consent of any superior authority is required, but if compulsory power needs to be exercised, then application must be made to the Secretary of State and Provisional Order obtained.

The Act does not, as your Committee are advised, contemplate that land acquired under Part III. should be let by the Council for others to build, so that if land is thus acquired, buildings erected upon it must be erected by the Council as the local authority.

On the general question raised by this first branch of the reference, your Committee think that, so far as concerns building on areas cleared by scheme, the powers of the Council are practically restricted, save in exceptional cases, to selling or letting for the purpose, the exceptional cases being such as may arise where no reasonable offers to purchase or lease are forthcoming; and that, as regards purchasing land under Part III. of the Act for the purpose of assisting in rehousing persons displaced by clearance schemes, the exercise of powers by the Council in this respect should be governed by the circumstances of each case. In this connexion your Committee recommend—

'That it is not desirable that the Council should adopt any general rule as to building itself, in preference to the letting or selling for building.'

As to the second branch of the reference (*b*), on December 3, 1889, your Committee submitted to the Council regulations framed so as to serve as a guide to the requirements of the Council in regard to construction and cubical contents of rooms of houses designed for the poorer classes. These regulations were approved and adopted by the Council, and your Committee see no occasion at present for suggesting reconsideration of them. The main general principle involved in them was that in no case should the distance between any block of buildings and other buildings be less than the height of buildings erected, and the larger experience since gained by your Committee confirms their opinion as to the desirability of adhering to this principle.

As to the third branch of the reference (*c*) your Committee have had prepared a return of all unlet and unsold property in the possession of the Council now vacant and available for building, a separate column indicating those properties which can be utilised for housing the working classes. Steps are being taken in almost all cases for sale or letting by auction."

The recommendation contained in the foregoing was agreed to, after some discussion.

The Proposed Municipal Lodging House.—On the recommendation of the same Committee, it was resolved, subject to certain conditions, to exercise compulsory powers to acquire certain properties required for the Shelton-street Improvement Scheme, Drury-lane.

The Main Drainage Question.—The discussion on this subject (see p. 291, *ante*) was resumed, and eventually the recommendation of the Committee was agreed to, with Mr. Bassett Hopkins's amendment as an addendum, so that the resolution agreed to is as follows:—

"That detailed plans be prepared of the new sewers on both sides of the river as proposed by Sir Benjamin Baker and the Chief Engineer of the Council in paragraph 10 of their joint report upon the main drainage of London. And that the Committee be instructed to obtain a further report, which shall have special reference (a) to the separation of the rainfall from the sewage in districts where it is desirable; (b) the better prevention of storm overflows into the Thames and Lea; and (c) the better purification of the river."

It was also resolved, on the recommendation of the same Committee,

"That tenders be obtained for the construction of a sludge vessel upon the model of the older and less costly ship, with certain modifications to be described by the Engineer."

After transacting other business, the Council adjourned.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At a meeting of this Association, held on Tuesday last, the President, Mr. T. Naden, being in the chair, it was unanimously agreed, on the motion of Mr. W. Henman, A.R.I.B.A., seconded by Mr. T. Naden, "That, whilst it is the opinion of this Association that it is usually desirable that the designing of important public buildings should be open to architectural competition, it is nevertheless advisable that, if any buildings are to be erected between the Victoria Courts and Newton-street, which may properly be considered as forming an integral part of the new Law Courts, they should certainly be regarded as a completion of Messrs. Webb & Bell's design, and should be placed in their hands, and not be the subject of a competition." The motion was supported by Mr. M. Hawley Lloyd (Vice-President), Messrs. W. Doubleday, A. Harrison, Herbert R. Lloyd, and others, and the hon. secretary was instructed to forward copies of the resolution to the Mayor and chairmen of the several committees interested. Other business having been debated, the meeting closed.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual meeting of the Northern Architectural Association was held on the 9th inst., in the Council-room of the College of Science, Newcastle, under the presidency of Mr. W. S. Hicks. The Secretary read the report of the thirty-second session, which stated that the number of members continued to increase, the total membership being 29 members, 22 associates, and 20 students, not including those elected at that meeting. The out-door meetings in the summer had been continued, and had been very successful. Negotiations were in progress for securing a permanent home for the Association. The committee deplored the action of the Institute in opposing the progress of the Registration Bill. On the motion of Mr. Glover, the report was adopted. The President announced that the business of the thirty-second session was now closed. He must say that it had been most successful in every way, in fact they had never had so successful a year. On the motion of Mr. W. H. Knowles, a vote of thanks was passed to the President and the Secretary (Mr. F. W. Rich).

EDINBURGH ARCHITECTURAL ASSOCIATION.—At the ordinary meeting of this Association, held on the 9th inst., a paper was read by Mr. A. H. Millar, Dundee, on "Curiosities of Architecture in Dundee." In giving a sketch of Dundee in stone and lime, Mr. Millar exhibited views of the Old Steeple, with ground plan and section; Lady Wark stairs, the Wishart Arch, Dudhope Castle, the Old Custom-House in the Green Market, known as Drummond Castle; interiors of some of the chambers in the Franciscan Nunnery, and several of the old sculptured stones taken from the Vault and from Whitehall Close. These buildings ranged in date from the fifteenth till the close of the seventeenth century. Passing to the examination of more modern buildings, Mr. Millar alluded to the change introduced by Mr. William Adam by his design for the Town House, erected in 1734, and showed that many buildings of last century,—St. Andrew's Church, the Trades Hall, the Episcopal Chapel, afterwards known as Union Hall, and Trinity House,—had been suggested by it. The next branch of the subject led him to the consideration of the street architecture of the olden time, and in a series of views chronologically arranged he showed the development of the modern streets from the wynds and closes of former times. The inner architecture of the closes,—the courts and back tenements,—were next illustrated by a number of views and descriptions of public buildings erected in Dundee during the last fifty years, which showed the great variety in styles of architecture now visible in the city.

n the motion of Mr. W. W. Robertson, of .M. Board of Works, seconded by Mr. Ross, a rdial vote of thanks was awarded to Mr. illar for his paper.

Glasgow Architectural Association.—he usual monthly meeting of this Association as held on the 7th inst., the Vice-President, Mr. Henry D. Walton, occupying the chair. A aper on Michael Angelo was read by Mr. obert Wemyss. An account of the artist's fe and work was given, illustrated with pho-ographs and prints. Greatest as a sculptor, ill the author said his architectural works are ot far behind the best work of his time. If his greatest work—St. Peter's, taken up hen an old man of 72—he showed somewhat ant respect to the intentions of its earlier rchitects, his design in turn was freely andled by his successor, and the dome, grand nough it be, is not what Michael Angelo's odel shows to have been his intention. At he close of the paper a criticism was given by Mr. William G. Anderson, after which a vote of hanks was passed to Mr. Wemyss.

LIVERPOOL ENGINEERING SOCIETY.

The tenth ordinary meeting of the present ession was held at the Royal Institution, olquitt-street, on Wednesday evening, 8th st., Mr. Ferdinand Hudleston, Assoc.M.Inst. .E., President, in the chair.

A paper was read by Mr. Alexander Ross, .Inst.C.E., entitled "Railway Signalling and nterlocking,"

The paper, which was of a highly technical haracter, opened with a short sketch of the rogress made in signalling as a rapid means of onveying intelligence between distant points, nce the adoption of the first-known sema-hore signal, which was used by the French in 794. The author then proceeded to describe great detail the working of the various ystems of railway signalling used from the arliest times up to the present day. The paper as illustrated by a large number of diagrams, ogether with models, which were greatly ppreciated by the members, who accorded Mr. oss a unanimous vote of thanks upon the rmination of his valuable paper.

Correspondence.

To the Editor of The Builder.

ENGLISH ARCHITECTS IN AUSTRALIA.

Sir,—In your issue of January 17, just to hand, a paragraph appears under the head of "Notes" referring to the local Institute of rchitects and its President.

I do not propose to enter into this question, which, as you admit, there is decidedly nother side, but I must take exception to the ause referring to the room for improvement the standard of professional practice. "This not unlikely to be the case in a new country, d one, moreover, which is still to a certain tent regarded by those who have been failures the Old World, either from defect of intel-ctual or moral fibre, as a place where they ay try over again."

Against this aspersion I must protest most rongly, both for myself and for the great ajority of my fellow-countrymen, whom I ow to be honourable men, desirous above all ings to maintain the English standard of ofessional practice, which is undoubtedly far gher than that which has hitherto been evalent in this colony.

Moreover, I am not aware of a single English chitect practising in Sydney who has been a ilure in the Old World from any cause what-er.

A few of us practised in Great Britain, others me out as young men in the hope that their nglish professional training would produce tter results here than in the overcrowded ena at home.

Some of us have been successful, and, unfor-nately, in a small community success has to y the usual penalty of jealousy and mis-presentation.

I quite admit that the standard of the pro-ssion requires raising in this colony, but if u will make fuller inquiries you will find that is those of English birth who are the fore-ost in their endeavours to effect this most sirable object. An Englishman.

Sydney, Feb. 25, 1891.

THE LATE MR. J. D. SEDDING.

Sir,—I am sure those who knew the late John D. Sedding and his works will echo and much appreciate your remarks in last week's *Builder*.

Sedding was, indeed, a true "artist architect," and yet with all his ability he was so modest, so unassuming, and devoid of self-conceit. His death is, indeed, a serious loss to architecture, and a serious loss personally to those who knew and loved him.

May I venture to suggest that you issue a few double plates containing a selection of some of the best works of Sedding? The illustrations might be grouped so as to get three or four on a double plate, or in such other way as you approve. A few of his works have been already illustrated in your excellent journal; but if reproduced in this new form I think they will be much appreciated by your readers.

April 14, 1891. James Neale.

The Student's Column.

VENTILATION AND WARMING.—XV.

PREPARATION OF THE FRESH AIR.

In order that the fresh air introduced by ventilation may be as fresh as possible, it is usually desirable to adopt some means of obtaining a higher standard of purity than exists in the normal conditions of the external atmosphere, particularly in large and smoky towns.

Fog is one of the manifestations of a smoky town atmosphere, which is particularly offensive, and of which it is eminently desirable, if possible, to be freed in our internal atmosphere.

When we remember what fog is, namely, the combination of smoke and solid impurities, with an atmosphere saturated with moisture, we readily understand that fog, as fog, may be prevented from manifesting itself inside a building by simply heating the fog-laden air on entry. The peculiar vesiculated condition of the suspended moisture in the atmosphere, which enables it to support the solid impurities of the fog, is removed by raising its temperature, and so more completely volatilising the water vapour, which then possesses too little coherence to carry any longer the smoke and grime. When, therefore, fog-laden air is brought in over a heated surface, a large part of the solid matter is deposited, and the atmosphere to that extent purified.

This extent of purification, however, falls short of perfection by a long way, and if we wish to have our fresh air as pure as possible we must adopt other and more effectual methods of cleansing.

Washing the incoming air by means of a water spray has been frequently utilised for the cleansing of an air-supply, and is an effectual process for removing much of the impurity. It, however, adds to the degree of moisture in the air, and this requires careful supervision and watching to ensure that the resultant hygrometrical state is neither unpleasant nor injurious. In hot weather, especially, the degree of moisture should have constant attention. If the air be warm, and also heavily charged with moisture, a sensation of languor and lassitude is induced, while, on the other hand, when an insufficient quantity of water is present, a sensation of dryness in the throat, and bronchial irritation is experienced. We have discussed in chapter iii. the extent of humidity desirable for English practice, and we should endeavour to keep within the limits of 70 to 80 per cent., which we found to be most suitable.

In the use of the water spray it is important to direct it in as finely divided a condition as possible, and to allow a good extent of fall. It is advantageous also to duplicate it, so to speak, so that the air passes through a double sheet of water with an intervening space between the two streams.

A further advantage of the water spray is that by its use the temperature of the incoming air may be considerably reduced, no mean advantage in hot weather.

Ice has, of course, been repeatedly employed to reduce the temperature of fresh air, and many expedients have been tried for its effective use. It has been placed simply as a block in the delivery ducts, or arranged in smaller pieces on a grid or frame set in an inclined position in the duct, or on shelves similarly arranged. But probably the most effective method of using ice is to reduce the temperature of the water spray by means of it, and with the cooled water to cool the air. It has been found that, by the use of a water spray, the temperature of the fresh air may be lowered by half the difference in temperature existing between the external atmosphere and the water spray.

Fresh air cooled over the surface of ice has been found to produce a sensation of especial freshness, even when the reduction in temperature measured by degrees of the thermometer is extremely small. This is, in all probability, owing to alteration in the humidity of the air, caused by the contact with the glacial surface.

Incoming fresh air has been sometimes partially cleansed of its grosser impurities by causing it to impinge upon the surface of a still sheet of water. This is the method adopted in many of the forms of wall-inlet boxes supplied by ventilating tradesmen for domestic use. When this description of cleansing apparatus is adopted far greater efficiency may be obtained by the substitution of a film of glycerine for the sheet of water. The glycerine is both a more powerful retainer of impurity and is more free from the probability of failure by evaporation. Such means of cleansing are, however, only suitable for small inlets, not for any important scheme of ventilation.

Where forced draught is employed, filter screens of various textile fabrics have been utilised to remove impurities from fresh air. These should naturally be of somewhat open texture, so as not to unduly retard the current of air. A certain amount of obstruction, due to the friction against their fibres, they must necessarily cause, but Professor Carnelley in the report already alluded to, quoted an instance, at the University College, Dundee, where the volume of air passing is actually 10 per cent. greater when the filter screens are in position than when the inlet opening is quite free. The explanation of this somewhat paradoxical fact is found in further experiments at the same place by Dr. Carnelley, which showed that when the filter screens are in position the current at various points in the section of the inlet opening is far more uniform than when the screens are removed. This showed that the irregular eddying current obstructed the flow of the entering air current more than the screen. The construction of the filter screens, here referred to, is worth noting. They are of coarse jute cloth, of the quality known as Light Hessian, which weighs 6½ oz. per yard of 40 inches wide, costs 2d. per yard, contains 67 meshes to the square inch, and is composed of threads whose diameter is one-fourth that of the mesh. It should be noted, as a further explanation of the apparent paradox mentioned above, that the inlet openings are of large size, and of oblong rectangular shape.

Conical-shaped bags suspended in the inlet shafts have been sometimes adopted with the idea of increasing the surface in proportion to the sectional area of the duct. What is known as cheese cloth or some similar textile is found to be a suitable fabric for the construction of these bag filters.

The most effective medium of all for filtering air is probably cotton wool of about 6 in. thickness, but this is expensive both in the first cost of the wool, in the necessity for frequent renewal, and in the additional power required to force the air through the very considerable amount of obstruction it presents.

In connexion with the purity and freshness of the air-supply there is a point which was emphasised by Dr. Reid in his memoranda or instructions for the management of the ventilating apparatus arranged by him for St. George's Hall, Liverpool, that is worth remembering. He says:—"Let no painting be permitted, except at proper periods, and none be used for warm apparatus, except the hard copal varnish, laid on in the most sparing manner in which it can be applied and retained. More trouble, annoyance, and dissatisfaction with the condition of ventilating works may often be traced to this cause than to any other; excessive painting takes away the freshness and elasticity of the air in an extreme degree, and too frequently gives it the character of being cooked or baked. No practice is so common in some public buildings as painting them immediately before the commencement of a season of occupation, to an extent that they do not get over till it is terminated."

One other matter there remains in connexion with fresh air supply, the regulation of its tem-

perature. This is, of course, a large question, but there is a clearly-marked key-note which should always be borne in mind. In any adequate scheme of ventilation, the whole of the air-supply should be admitted to the apartment or chamber ventilated at the temperature required. No attempt should be made to warm the apartment by the admission of air at a high temperature so as to mingle with the cooler internal atmosphere. To bring the fresh air to the right temperature, it is advisable to construct an equalizing or mixing chamber below the floor of the apartment. In this mixing chamber the warmed air from the heating apparatus can be tempered to the requisite degree by the admixture of the necessary amount of cold, fresh air, and the temperature can in this way be regulated to a nicety. The adoption of such an equalizing or mixing chamber also greatly assists the equable distribution of the fresh air, and thus prevents draught.

OBITUARY.

Mr. Keeley Halswelle.—We regret to announce the somewhat sudden death in Paris of Mr. Keeley Halswelle, R.I., A.R.S.A., on Saturday. He was within a fortnight of completing his 59th year.

GENERAL BUILDING NEWS.

New Parish Church at Epping.—The new parish church of St. John the Baptist, Epping, was consecrated on the 8th inst. According to the *Essex Chronicle*, the old parish church of All Saints', at Epping Upland, is fully three miles from the town, and the chapel-of-ease of St. John the Baptist was inadequate to requirements. In addition to this, there was a strong feeling that the parish church should be in the centre of the population. In 1888 an Act of Parliament was obtained under which the new church is made the parish church, and All Saints' will be a chapel-of-ease. The work of building the new church was commenced in 1889, and the memorial-stone was laid by Miss Elizabeth Horsley Whiteman, on November 6 in that year. The new church is constructed externally of wrought stone, and there is a good deal of wrought stone internally. The style of architecture is Gothic of the fourteenth century. The church is covered in with a wagon roof with moulded panels. The plan consists of a nave of five bays, terminated by a lofty carved oak screen, a chancel of two bays, and a sanctuary of one bay. When completed the church will have two aisles, but only the south aisle has been built at present. There is a side chapel at the south side of the chancel, and the vestry and sacristy adjoin the chapel. The chief feature of the interior is the lofty arcade on the south side. The piers and arches are boldly moulded. There is no chancel arch, but one continuous width for the nave and chancel. Oak screens, however, mark the distinctive parts of the fabric. The chancel screen is surmounted by a carved oak cross. The large east window is of seven lights. The subject of the central light is "The Crucifixion," and the subjects of the central lights of the side groups are "The Risen Christ" and "The Blessed Virgin with our Lord." This window has been given by Mr. E. J. Wythes, in memory of his father and mother. The window in the side chapel is given by the Vicar, in memory of a brother, the subjects being St. Stephen, St. Christopher, and St. Dunstan. Both windows are by Messrs. Burlison & Grylls. The font and lectern are the gifts of Miss Whiteman and friends. The roof of the nave and chancel are decorated in colours, and there is a good deal of gilding and illuminated lettering in the chancel roof. The painting was executed by Mr. Powell, of Lincoln, under the direction of the architects. The church is seated with chairs, and will accommodate some 700 worshippers. The tower (the erection of which, as well as that of the north aisle, is deferred) will rise on the south side of the church, and will be connected with it by a cloister-like passage. The contractors were Messrs. Rudd & Son, of Grantham, and the architects are Messrs. Bodley & Garner, of Gray's-inn-square. The expenditure already incurred is upwards of 10,000*l.*, of which sum Miss Whiteman gave 3,000*l.*, Mr. E. J. Wythes, of Copt Hall, Lord of the Manor, 4,000*l.*, and the Vicar (the Rev. E. Buckmaster), 1,500*l.*

Christ Church, Southwark.—This church has been enlarged by the addition of a chancel thirty-five feet in length, with an organ chamber on the north side, and clergy and choir vestries on the south. By this addition, the space in the nave, formerly occupied by the organ and the quasi-chancel, has been made available for sittings. The old church is of simple, but not mean, character, in the style that was used for ecclesiastical purposes at the time of its erection, early in the Georgian era. The walls are of brick, with stone cornices and quoins and dressings to the windows and doorways. The building, although interesting, as marking the taste of the period of its erection, seemed to be hardly suitable for giving the keynote for the style of the additions. The architect therefore adopted for the new work the round-arched style of Central Italy, as being sufficiently in keeping with the Classic work of the original structure. The new walls are of brick, with stone dressings. Internally, the brickwork is plastered, and red and white stones are used for the dressings, some of the shafts being of red marble. The chancel ceiling is divided by ribs into panels, which it is hoped may at some time be decorated. The upper part of the eastern wall is intended to receive a painting of "Our Lord in Majesty." The five memorial windows removed from the former apse have been refixed in the new chancel. The altar is raised eight steps above the nave. The steps are of white marble, and the paving is of marble and tiles. There are structural sedilia, credence, and piscina in the south wall. On the north side of the chancel, a double arch opens into the organ chamber, which has also an arch into the north aisle. The jambs of the chancel arch have, on the western side, panelled and sculptured medallions. On the north side are busts of the Latin Fathers, and on the south side those of St. George, St. Alban, St. Augustine of England, and St. Edward the Confessor. On the jambs of the organ chamber arch are carved the arms of the Marshall trustees, the patrons of the living, and the arms of Bishop Thorold. Over the doorway leading from the south aisle into the vestry, is carved "*Christus Redemptor mundi Deus.*" The body of the church, originally in one span, has had stone arcades introduced, forming nave and aisles. The columns are of red stone on pedestals, and the arches are of red and white stone. The side portions of the galleries have been removed, leaving the western gallery across the whole width of the church. The inside of the old windows in the aisles are at present of their original plain character, but it is intended, when circumstances permit, to add stone dressings to them without altering their external appearance. The whole of the old portion of the church, including the tower and spire, has been thoroughly repaired. The cost of carrying out the additions has been very large owing to the necessity of carrying the foundations down through a bed of peat to the solid gravel, at a depth of twenty feet below the surface. The angles of the old building have had to be underpinned to the same depth. The works have been carried out by Mr. G. Dobson, of Colchester, from the designs of Mr. Chas. R. Baker King, A.R.I.B.A. The carving was executed by Messrs. Farmer and Brindley. Messrs. Luscombe, of Exeter, made the litany desk from the architect's designs. The cost of the work has been about 6,300*l.* The church is to be opened this day (Saturday), by a special service at 3 p.m.

Extension of North Stainley Church.—On the 25th ult., Miss Staveley, of Old Sleningford Hall, near Ripon, laid the foundation-stone of a new chancel to the Church of St. Mary the Virgin, at North Stainley, near Ripon. The present church is a parallelogram, 36 ft. by 24 ft. The additions will consist of a chancel, 24 ft. by 18 ft., the present church becoming the nave, a vestry with organ-chamber on the north side, and a porch on the south side. The style adopted is second pointed or Decorated of the fourteenth century. The new work will be built of stone from Miss Staveley's quarry, with dressings inside and out of Rainton stone. The present church will be re-seated as the future nave, the plaster ceiling removed, and the timbers boarded and formed into panels with pitch-pine. A warming apparatus will also be provided. The chancel will be furnished with oak stalls for clergy and choir, tile pavement on floor, and the roof of pitch-pine in panels. The total cost of the work will be about 1,000*l.* The builders are Messrs. Kay & Son, of Rainton, and Mr. John Metcalfe, of North Stainley. Mr. R. J. Withers, of London, is the architect.

New Drill Hall, Grimsby.—On the 1st inst. the Right Hon. Edward Stanhope, M.P., Secretary of State for War, formally opened new headquarters and a drill-hill, which have been erected at Grimsby for the 1st Lincolnshire Artillery Volunteers. The land and buildings, which represent altogether an expenditure of about 6,000*l.*, have been presented to the corps by the directors and shareholders of the Manchester, Sheffield, and Lincolnshire Railway Company. The buildings, which occupy a site in Victoria-street, form a two-story block, and contain an armoury, orderly-room, band-room, officers', sergeants', and gunners' rooms, &c. Behind the offices is the drill-hall, which is 96 ft. long by 52 ft. 6 in. wide. It has an open roof of iron construction, and the flooring, which is on a concrete foundation, is of solid wood blocks, laid in herring-bone pattern. Facing Victoria-street there is a square, central battlemented tower, rising to a height of 43 ft., with a circular angle turret. The works have been carried out by Mr. J. Wilkinson, Cleethorpes, from plans and under the superintendence of Mr. E. W. Farebrother, architect, Grimsby.

New Cemetery, Wilton.—The dedication of a new cemetery at Wilton, near Salisbury, took place on the 19th ult. The site for the cemetery comprises about two acres, and abuts upon the high road leading from Wilton to Ugford. It is enclosed on the east and south sides by dwarf walls and iron railings about 8 ft. high, whilst the north and west sides are enclosed with hedges with roadways beyond. The entrance is on the north side in the centre of the site under covered entrance gateway, with caretaker's lodge on the right-hand side, and waiting-room on the left, the whole forming one building, and being designed in Late Tudor style and built of red bricks and Bath stone dressings. The windows and doorways are of moulded stone. The buttresses are of red brick with stone weatherings. The roofs are covered with Broseley tiles. The carving was executed by Mr. Harry Hems, of Exeter. The contract for the works was taken by Mr. Gilbert Harris, of Salisbury. The laying out and the whole of the work has been carried out from the designs and under the personal supervision of Mr. Fred Bath, architect, of Salisbury.

Re-opening of Ston Easton Church.—Ston Easton parish church, which is dedicated to St. Mary, has been closed for the past twelve months, during which it has undergone restoration, from the designs and under the superintendence of Sir Arthur Blomfield, A.R.A., the builder being Mr. John Thompson, of Peterborough. The original church dates from the Norman period. The nave arcade is, however, of the fourteenth century. The windows throughout are of the Perpendicular style. The entire church has been re-seated with oak seats. The choir-stalls and altar-rail are of oak, and a carved oak pulpit is placed in the building. A carved oak screen has been placed between the south aisle and the vestry. The floors of the nave and aisles are laid with wood block flooring, and the church is supplied with Messrs. Haden & Sons' heating apparatus. Several stained memorial windows have been placed in the church, as well as a new font, with a carved oak canopy. The work has been carried out at a cost of 3,000*l.*

New Police Station, Doncaster.—The new police station for the Lower Strafforth and Tickhill Division of the West Riding was opened recently. The premises include court-house, police offices, superintendent's house, groom's house, stabling, &c., and are situate on Station-road. The main building, comprising the court, the police offices, and the superintendent's house, is built with Conisborough faced bricks, with dressings of terra-cotta from Ruabon, in Wales. The coping of the boundary walls is of Dumfries stone, and all the window sills are terra cotta. Admission to the building from the front is gained by four entrances. The police offices are on the ground-floor, in front of the building, and include the superintendent's office, the charge room, and the constables' room. Dividing these offices from the cells, which occupy the back part of the building on the ground-floor, is what is termed the cell area, 54 ft. by 18 ft., the floor of which is a granolithic pavement. The cells are six in number. Over the cells and cell area is the court room. The public ascend to the second story by means of a stone staircase. The staircase leads into a public waiting-room with marble mosaic floor. The floor of the court room is of pitch-pine woodblocks. Accommodation is provided for about 200 persons. The room is lighted by seven windows, with stained-glass panels at the top. The court room and all the adjoining offices are warmed by hot-water apparatus, by Haden & Son, of Manchester. The plans were supplied by Mr. J. Vickers Edwards, the West Riding Surveyor. The contractor for the masonry, bricklaying, &c., was Mr. B. Wortley, Doncaster.

St. Leonard's Church, Grimsbury.—St. Leonard's Church, Grimsbury, near Banbury, the foundation-stone of which was laid last July by the Bishop of Oxford, was opened on the 7th inst. The new building has been erected from the plans of Mr. W. E. Mills, A.R.I.B.A., Banbury. The style is thirteenth century Gothic. The church consists of chancel, nave, two aisles, with organ chamber and choir vestry, narthex at the west end with two doors, and entrance porch at the south side. The dressings of the building are Bath stone, and the roof is covered with Brownhill tiles. The nave and aisles are laid with wood blocks and the chancel with eucaustic tiles. The chancel is raised two steps above the nave, and contains sedilia and piscina. Mr. W. G. Manwaring has presented an oak pulpit. The windows are filled with cathedral glass. The roof is open, of unstained deal, and there is a bell tower on the exterior of the roof immediately over the chancel arch. The building is heated by a Parrott's stove. The church will accommodate 350 people. The builder was Mr. J. S. Kimberley, of Banbury, and his contract was £2,600.

FOREIGN AND COLONIAL.

France.—A committee has been formed at Valmy to erect a monument in memory of the great battle there in 1792.——M. Mercié has been commissioned to execute the national Joan of Arc memorial for Domrémy.——A committee has been formed at Rouen to erect a monument to the late M. Pouyer-Quertier.——A rope railway has just been opened at Lyons to connect the Croix Rouge with the Place Croix-Paquet.——M. Louis Gonse has been appointed a member of the Commission des Monuments Historiques, in place of the late M. Laisné.——M. Jules Comte, M. Duplessis (curator of engravings in the Bibliothèque National), M. Georges Lafénestre, and M. Keraniou, have presented themselves as

candidates for the place in the Académie des Beaux-Arts left vacant by the death of M. Lenoir.——M. Carolus Duran has been named president of the jury of the Champ de Mars Salon, M. Dagnan-Bouveret Vice-president.——Out of 2,070 pictures sent to the Champ de Mars Salon by outsiders 243 have been accepted, and 168 drawings and pastels out of 952. The examination of the works of Associates will commence on the 18th (to-day).——The Jury of Architecture at the old Salon is composed of MM. Vaudremer, Ch. Garnier, Coquart, Daumet, Pascal, Guadet, Ginain, Normand, Raulin, Mayeux, Loviot, Laloux, and Deslignières.——An exhibition of the works of Edmond Yon, the landscape painter, has been opened at the Galérie Georges Petit.——The Jury of the Ecole des Beaux-Arts have just decided on the sketches for the first trial for the sculpture competition; subject, "Briseis weeping over the body of Patroclus." Twenty students have been admitted to take up the second competition, the subject being "The Ghost of Cæsar appearing to Brutus."——The death is announced of M. Multzer Isabelle, Government architect, at Paris, at the age of 57. He was a pupil of Isabelle, Blouet, and Gilbert, and was entrusted successively with the reconstruction of the Palais de Justice at Angers, the baths at Bourbonne-les-Bains, and was lately architect-in-chief to the Ecole des Arts et Métiers and to the bathing establishments under State control.——The death is also announced of M. Francois Gilbert, sculptor, formerly President of the "Chambre Syndicate des Sculpteurs." He was a pupil of Cortot, obtained the Cross of the Legion of Honour in 1856, and executed works of some importance, especially the decoration of the Salle de la Bourse at Marseilles, and of the Salle des Pas Perdus of the Palais de Justice in the same city. ——A picture by Alexandre Hesse has been placed in the Chamber of Deputies, representing "Mirabeau at the Sitting of June 23, 1789," which was lent to the Museum at Amiens some years ago by the Government.——M. Legendre, architect, of Nantes, has been appointed non-resident member of the Société Centrale des Architectes, in place of M. Durand, of Bordeaux, recently deceased.——The Association of "Architectes Diplomés par le Gouvernement" have addressed to the Municipal Council of Paris a request that their exhibits at the *Salon* may be considered eligible for purchase by the Municipality, as well as the works of painters and sculptors.——At the Ecole des Beaux-Arts the students' works executed in the simultaneous course of instruction in the three arts have been under inspection; M. Quarez (pupil of M. Guadet) and M. Auberville (pupil of M. Pascal) have been admitted into the first class.

Progress of Benares Waterworks.—In the report of Mr. Wilson, the Resident Engineer, for December, it is stated that the earthwork in the embankment and excavation of settling-tanks has been nearly completed. The water in Nuneriah-Sikhra having been exhausted, the steam pump has been removed to Saukhudharra tank. The laying of the pipes of the rising-main from the Ganges has now been commenced, and when these have been laid an ample supply of water for the works at the distributing station will be obtained. The concreting and brickwork of the tanks are now in hand, and arrangements have been made by Messrs. Walsh, Lovett, & Co. with the Bengal Stone Company at Chunar for stone ballast for the concreting, as superior to brick ballast. In filter No. 1 about 20 per cent. of excavation has been done; in filter No. 2 concreting under main walls and central drain completed; in Nos. 3 and 4 about 90 per cent. excavation finished; in No. 5 concreting under main walls and drain completed and about 2 ft. of brickwork in main walls and central drain built; in No. 6 concreting under main walls and drains completed and brickworks on three sides of main walls in progress; No. 7 concreting under main walls completed and about 3 ft. of brick ventilators being fixed. In the reservoir some 90,000 cubic feet have been excavated to an average depth of 10 ft. Pipes of different diameters are arriving in large quantities daily and have been delivered at the distributing-station and along the rising main.—*Indian Engineer.*

MISCELLANEOUS.

Examinations, Surveyors' Institution.—Too late for this week, as they came to hand just as we were going to press, we have received the lists of candidates who have passed the recent examinations for the Professional Associateship of this Institution. We will print the lists next week.

"Characters and Costumes of Old Edinburgh."—Some months ago the Corporation of Edinburgh acquired by purchase a number of water-colour sketches representing municipal officials and Court officials connected with Holyrood and the various Corporations in the city about forty years ago. The collection embraces portraits of Town Councillors, Bailies, and Provost, the deacons, and various Corporations of Easter and Wester Portsburgh, Calton, and Canongate; costumes of the various officers connected with these Corporations, of street characters and workers, and of the various trades in the early half a century ago. There are also banners and insignia of the trades, batons, seals, and armorial bearings. All these sketches were in single sheets, and they have now been mounted and bound in coloured morocco and gold by Messrs. Macniven & Cameron. There are other two volumes bound in red morocco which contain letters of an early date from the various Lord Provosts and other distinguished Scotsmen. As years roll on the collection of portraits will increase in value, as most of the originals have either been lost or destroyed. The volumes, which measure 22 in. by 16 in., will be exhibited for the first time at the conversazione which is to be held on Monday to commemorate the opening of the extended and improved City Chambers.—*Scotsman.*

National Registration of Plumbers.—The third annual meeting of the registered plumbers in the Edinburgh and East of Scotland District was held in the Lecture Hall of the Philosophical Institution, Edinburgh, on 13th inst. Professor Armstrong presided, and in moving the adoption of the report he said that, considering the important and peculiar nature of the work plumbers had to perform in relation to the health of the individual and of the community, it was desirable alike in the interests of the public and of the craft that none but efficient and trustworthy workmen should be employed to perform the work. An incompetent and inexperienced workman might be described as a "pestilence that walketh in darkness," and it was to remedy this that the movement had arisen. A good deal had been said about the education of plumbers, and his experience taught him that what they most needed was a competent acquaintance with the scientific principles upon which the craft was based, and to which it must owe its progress and advancement. Mr. Ainslie seconded the adoption of the report, which was carried unanimously. Sir Douglas Maclagan was re-elected President, Mr. Robert Little Vice-President, and members of Council and other office-bearers were also appointed. The clerk to the Worshipful Company of Plumbers gave an outline of the progress of the movement throughout the kingdom, and a motion was adopted declaring that, in the opinion of the meeting, the national registration of plumbers was essential in the interests of public health. —— Meetings of District Councils were also held at Aberdeen and Sheffield last week. ——On Monday night, at the People's Palace, Mile-end-road, prizes were distributed by the Plumbers' Company to the students of the People's Palace Technical Schools Plumbing Classes. Mr. Taylor (instructor in plumbing) delivered a brief address, in the course of which he gave a gratifying account of the progress of the classes. There were now no fewer than fifty members, and he hoped that next session they would have a yet larger attendance than they had had heretofore. The Master of the Plumbers' Company (Mr. Bishop) next distributed the prizes, consisting of books on the art of plumbing.

Roman Lincoln.—A most interesting discovery has been made by Mr. Teague, the Corporation Waterworks Engineer, in laying the new main in Bailgate. On turning from Westgate into Bailgate, the bases of three more Roman columns were found exactly corresponding in detail of moulding with those under Mr. Allis' and Mr. Blaze's properties. Mr. Thropp, assisted by Mr. Allis, has taken dimensions fixing the positions of the three columns relatively with those so carefully preserved by Mr. Allis and Mr. Blaze, the total distance from the centre of the extreme north column to the most southern one, now to be seen, is 150 ft. 4 in., the distance from centre to centre of each column varies from 14 ft. to 15 ft. The extreme north one, under Mr. Allis' house, is a double column, and so is the last one under the corner of Mr. Blaze's house. The depth from the surface of the road to the shaft of the column immediately above the base is 5 ft. 10 in., and from the surface of the road to the bottom of the large square plinth stone is 8 ft. 9½ in. The plinth stone has been cut away on the west side to allow the main to be laid. It is evident that the building had been far more extensive than was originally supposed, and even the exact direction of the Roman street running east and west through the city may not accord now with previous supposition. The positions of the new columns, as drawn on the large ordnance map, show an exact continuation of the face line of this large building, of which they formed part. The rubble wall, built from column to column, still goes southwards from the last column found. It is expected that further discovery will follow.

Royal Meteorological Society.—The usual monthly meeting of this society was held on Wednesday evening last, at the Institution of Civil Engineers, Great George-street, Westminster, Mr. A. Brewin, Vice-President, in the chair. The first paper read was "On some remarkable features in the Winter of 1890-91," by Mr. F. J. Brodie, F.R. Met. Soc. The author pointed out the peculiarities or special features of interest in the weather which prevailed over the British Isles during the past winter. In addition to the prolonged frost which lasted from the close of November to about January 22, he finds that the barometric pressure for the whole winter was about a quarter of an inch above the average; and that when the wind was not absolutely calm, there was an undue prevalence of breezes from some cold quarter. The percentage of winds from the southward did not amount to one half of the average. The number of foggy days in London was no less than twice the average. The rainfall over the greater part of the British Isles was less than half the average. The author says that almost every element in the weather has been influenced to an abnormal degree by the remarkable prevalence of high barometrical pressure, and if we were called upon to define the season 1890-91, we should have little hesitation in giving it the name of the "anti-cyclonic winter." The second paper was on "The Rainfall of February, 1891," by Mr. H. S. Wallis, F.R. Met. Soc. This was one of the driest months upon record; the mean rainfall over England, excluding the Lake District, being only 0·066 in., or about one-fortieth of the average.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

3,883.—Open Fire-places: *C. Whitfield.*—The object of this invention is to obtain the heating effect of a closed stove, and promote the ventilation of the room. A canopy is fitted at the top of the stove, enclosing the opening leading to the chimney, and a tube is fixed through the canopy to the flue. The fire, while it can be seen from the front, is partially enclosed, and the heating effect of the top plate makes the open fire give nearly the effect of a closed stove.

4,118.—Fireplaces: *J. Shaw.*—According to this invention, a plate is placed loosely in the chimney, the base resting on the fireplace level with the top bars, the pins resting against the front of the chimney or fireplace to narrow the draught of the chimney to the space measured by the length of the pin and the width of the opening. This arrangement secures a uniform draught, complete combustion of fuel, and prevention of smoke and down-draught. The heat is reflected from the metal plate into the room instead of passing up the chimney.

1,619.—Door-fastener: *J. W. Dart.*—The catch of the fastener, which is the subject of this patent, is fixed on the lintel of the door-frame, and to the catch is affixed a small line connected to the ceiling by means of two pulleys. This line drops at the stile of the door-frame, being out of the way, but at a convenient height to be reached by a child. When the catch is pulled, the bolt on door is allowed pass and the door to open.

6,892.—Fitting Air-tight Cases, Windows, &c.: *J. G. Stidder.*—On the sill of a sliding window or door the patentee places a metallic channel of U section and a smaller channel with drainage-pipes. A bar of T section is at the lower edge of the bottom rail, the upper part projecting beyond the outer wall of the first channel, the vertical limb of the bar impinging against the outer edge. Vulcanised rubber strips are also fitted to make air, water, and dust-tight joints.

12,765.—Flooring Blocks: *E. Gregory.*—According to this patent the blocks of wood or of other material overlap at their edges, and each block is held down by four adjacent blocks, and also holds down the four adjacent blocks.

19,063.—Ceilings and Walls: *T. H. Recknell.*—According to the specification the ceiling or wall is first prepared with a wood surface, then pieces of glass or china of various patterns and colours are fixed to the wood surface with screws and washers at all the corners of each piece.

NEW APPLICATIONS FOR PATENTS.

March 31.—5,590, F. Kilsey, Spring Hinges.—5,594, H. Lake, Pipe-couplings.

April 1.—5,599, J. Bloomfield, Material for Ceilings, Wall-linings, Cement Slabs, &c.

April 2.—5,703, W. Harford and W. Roberts, Supporting and Controlling Venetian Blinds.—5,709, O. Clausen, Manufacturer of Fire-clay and Magnesian Bricks, and Kilns for same.—5,719, A. Boult, Artificial Stone.

April 3.—5,734, J. Humphrey, Pivot Butt Hinge.—5,757, H. Fairbrother and M. Damon, Machine for Bending Wire Wall-ties.—5,772, C. Henlser, Clay Presses for making Tiles, &c.—5,787, C. Edwards, Manufacture of Drain-pipes, &c.

April 4.—5,807, J. Lauder and W. Thomson, Bath Walling and Floor-tiles.—5,810, T. Hydes. Manufacture of Hydraulic Cement. Concrete. Dry Mortar Bricks, Tiles, &c.—5,839, C. Tompson, Sanitary or Drainage-pipes.

PROVISIONAL SPECIFICATIONS ACCEPTED.

1,847, J. Mellor, Door Check or Closer.—2,389, J. Perry, Socket-bolt for Windows.—2,619, G. Downie. Smoke-consuming Apparatus —2 655 W. Beetham and J. Thomas, Chimney Cowl.—2,763, C. Ehmann and F. Heaton, Window and Door Fastener.—3,237, M. Pickett, and T. Collins, Sash Fittings and Frames.—3,693, T. Messenger. Combined Locks and Latches for Doors.—3 983, A. Boult, Fire-grates.—4,106, W. Hartridge, Preventing Escape of Smoke from Chimneys, &c.—4,327, T. Fansrio, Supplying Disinfectants to the Flushing-pipes of Urinals, &c.—4,423, J. Kaye, Latches for Doors.—4,750, The Société Anonyme des Ardoisières de Deville and another, Building Material.—4,779, T. James, Glazed Panels for Furniture and Interior Decorative Work.—4,960, J. Boyd-Wilson. Compositions for Use in Building Constructions, Fire-resisting Constructions, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

8,558, W. Coulson, Metallic Frames and Supports for the Glass, &c., of Greenhouse and other Roofs.—3,636, F. Eagleton, Range and other Stoves —8,634, W. Cockburn, Securing Door Knobs to their Spindles —8,817, E. Radler, Hinges.—1,280, A. Elmendorf and others, Water-closets.—2,823, C. Gannaway Ventilators.—2,884, S. Van Vliet, Scaffold Brackets.—3 351, R. Courau, Plaster Slabs.—3,724, R. Hermanns, Constructing Stairways.—3,763, C. Zander, Self-locking Apparatus for Doors.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Additional Wards, &c. at Dispensary Bury	Board of Management	20l. 10l. 5l.....	May 1
*Public Hall and Offices, Earlestown	Newton-in-Mackerfield Commissioners.....	50l. 25l. and 15l..	May 28

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*York and Tar Paving, Kerbing, &c.	Headingley Local Board	S. S. Grimley	April 20
*Kerbing, Tarpaving, Metalling, and Channelling Work.....	Lewisham Bd. of Wks	*Official*	April 21
*Pulling-down Buildings.....	Holborn Union	H. Saxon Snell	do.
*Fitting-up of Lavatories	Southend Local Board	*Official*.....	do
*Compensation Reservoir	Nelson Corporation ..	J. Newton & Son	April 22
*Cast-iron Lamp Posts.....	Hackney Bd of Works	J. Lee-rove	do.
New Gas Works, near Pontypridd.....	Ystrad Gas and Water Co	*Official*	do
Sewer Houses, Stanley, Durham.....	.....	J. W. Rounthwaite .	do.
Erection of Cottages, Glam.....	Football Club	B. R. Evans	do.
Additions to Parsonage, Belmont, Belfast	[illegible] & Co	J. Lister & Son	do.
Fire Engine Shed	[illegible] Rural Dist Bd	[illegible] Rigby ..	do.
*Reconstruction of Pavements, Sanitary Fittings	Kensington Guardians	J. W. Aldwinckle ..	April 23
Waterwork Extensions	Robin Vale Local Board	T. J. Thomas	do.
Kerbing, Paving, Channelling and Making Good	Local (Staffs) Improvement Commrs.	John Myatt	do.
Alterations and Additions to School	Tedmorden Sch. Bd	Isaac Horsfall	April 24
Repairing Brewer Warehouse, Glass Lane	Brewery C	.....	do.
Engine Houses and Shafts	.....	J. Lister Peckett	do.
Road Metal and Path Paving	Abergavenny Local Bd.	R. J. Mouncher	April 25
Draining Part of Parish	Maidstone Union	*Official*	do.
*Maintenance and Repairs to Pipes, Lecture Hall, Church, Sch. Bd. and Residence of Caretaker, Cardiff	Monkwearmouth C.	T. H. Postill	do.
*Breaking Granite	Rev. R. H. Smythe ...	.....	do.
*Swab's Pasture	Maidstone Corporation	W. G. Scoones	do.
Wesleyan Chapel (Land) Car. Isle	City of London Union	*Official*	April 27
Improvements, Outbuildings, &c.	Barry & Cadoxton L. B.	J. C. Pithers	do.
*Iron Railings to Burial Ground	St Mary Abbots Glouc	A. Saxon Snell	do.
*Painting, Glazing, and other Works .	Vestry of St Mary Lambeth	*Official*.....	do.
*Two Street Sweeping Machines	.....	do.	do.
Heading-in Waterworks.....	Ripley Local Board ..	R. Argile	do.
Thirty-six Houses, Tyrallwydd Estate, Mountain Ash, Glam.	Building Club.....	Thos. Roderick	do.
Cottages at Waterworks.....	Sandhach Local Board	W. Wyatt.....	do.
*New Cottages	Pant Rural Sanitary Local Board.	F. W. Shenton	do.
Pair Semi-detached Villas, Stabling, and Walling, Halifax	.....	T. Lister Patchett	April 28
Repairing Boiler, and Machinery for Waterwells	Brighton Corporation	*Official*.....	do.
*Road Metal to Pits, Works.....	Wilesden Local Board	O Claude Robson	do.
*Sewers, &c.	West Ham Council ..	Lewis Angell	do.
Rebuilding Cottages, Woodhouse-Street Leeds	.....	Geo F. Danby	do.
Disinfecting Works, Royal Oak	Uckfield Local Board	*Official*	do.
Road Repairing (3 years)	Sheppey R.S.A.	do.	do.
*Repairs to Engines and Pumps &c.....	West Ham Council....	Lewis Angell	do
Pulling down Buildings, Erecting Walls, &c.	Selby Local Board....	Thos. Mallinson.....	April 29
*Re-newing Roof, Artillery Barracks, Woolwich	War Department	*Official*	do.
*Construction of New Roads, Sutton, Surrey	.....	Blake, Haldock, & Co.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Roadmaking and Paving Works.....	Fulham Vestry ..	W. Sykes	April 29
Sch ol, Transept, Lear Cranbu	Mynd ton-cum-Sch B	A D Edwards.....	do.
*York Paving Stone	Bromyard Bd. of Ws	*Official*	do.
Flint Road Metal	Bickley Local Board	do.	April 30
Kerbing and Channelling, Beaconwood Road Forming, Sewering, and Metalling, Gal ton Street	Smethwick Local Bd.	I. C. Stuart	do.
Subway, Contract No. 5	.....	do.	do.
*Enlargement of Post-office, Coventry	Glasgow District Subway Co	Simpson & Wilson ...	May 1
Widening Windsor road Bridge, Cardiff	Cons. (T H W'ks &c	*Official*	do.
School Premises Aberfan	Penyarrey Real Co.	do.	do.
Two Houses, Scotland Road, Stanwix Carlisle	Merthyr Tydfil Sch. B	J. Williams	do.
*Rail Works.....	T. Ridley	Geo. Armstrong...	do.
*Boiler Engine, Pumps, &c. for Waterwk	Southend Local Board	[illegible]	May 2
*Engine and Boiler House, &c (Waterwks	West Cowes Local Bd	W. Brown.....	do.
*Storage Reservoir	do.	do.	do.
*Alterations to Covered Way at Darenth Asylum	Taunton Corporation Waterworks....	*Official*	May 4
*Painting, Repairs, &c	Met. Asylums Board	do.	do.
*Retort House and Coal Stores	Earl of Lonsdale	do.	do.
*Road Scarifier and Traction Engine ...	Electric Lighting Co	H. E. Jones, C.E. ..	do.
Knitting Machine, &c.	Bishop's Waltham ...	T. de Carey Meade ..	do.
Gasholder Tank	Mr. Hall, R.D.C.	do.	do.
Labourer's Cottages, nr. Forres, N.B. ...	Newcastle-on-Tyne & Gateshead Gas Co.	*Official*	May 5
Cricket and Lawn Tennis Club, Hipperholme, Halifax	Wm. Brown.....	do.	do.
*Precipitation Tanks (Main Drainage Scheme)	.....	Rastrick Berry	May 9
Steel Roofing, 173,000 lbs.	Manchester Corp	T. Allison	May 13
Block of Cottages, Cerbridge-on-Tyne	Govt. of New South Wales	*Official*	June 24
Restoration of Church, Wadebridge, Manby, Devon	H. S. Edwards.....	Mountjoy & Carr ..	No date
Building Shop and Dwelling-house	.....	G. H. Fellowes Prynne	do.
Two Houses and Three Shops, Worksop ..	.....	Hubert Bond	do.
Vicarage, St. Aidans, South Shields.....	Geo. Smith	John Alsopp	do.
Broken Stag Road Metal, Chesterfield Street	.....	J. H. Morton	do.
Twenty Limestone Cottages, Shap, Westmoreland	Joseph Goldsbrough..	.....	do.
Timber, Ironwork, &c. Castleford.....	Shap Granite Patent Concrete Co.	.....	do.
Storage Tank and other Waterworks, Deanshanger, near Stony Stratford....	Fryston Coal Co. Ltd.	.....	do.
Shed Buildings, Board room, &c. Stamford-road.....	Potterspury U.R.S.A.	J. Ingman & Shaw ..	do.
Stabling and Additions to "Field Head," Shipley, Leeds	Kettering Local Board	Gotch & Saunders	do.
Institute, St. Marks, Cathcart-street Woolgate Locos	Mrs. Croft.....	Smith & Tweedale....	do.
Vaults, Meeting Room, Stables, &c. Railway Hotel, Featherstone, Leeds	Misses March	do.	do.
Catholic Church, Lloyd-street, Llandudno	.....	Richardson & Simpson	do.
*Alterations, &c. to Working Men's Club, Hackney.....	.....	Edmd. Kirby	do.
*Pulling-down and Re-erecting about 50 Bays and Riding School.....	The Committee	W. Batteu.....	do.
	Nessden Model Farm	.....	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Clerk of Works	Bournemouth T. C. .	3l. weekly	April 24
*Assistant Surveyor	Coventry Corpn	200l.	April 27
*Clerk to City Surveyor	do.	150l.	do.

Those marked with an Asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv, vi. *and* viii. *Public Appointments, p.* xx.

MEETINGS.

SATURDAY, APRIL 18.

Crystal Palace School of Engineering.—Award of Certificates. Sir Douglas Fox will take the chair in the Lecture Room at 1 p.m.

Royal Institution.—Professor Silvanus P. Thompson on "The Dynamo." II. 3 p.m.

Edinburgh Architectural Association. — Visit to Fountainhall, Pencaitland Church, and Winton Castle.

Glasgow Architectural Association.—Visit to Largs.

MONDAY, APRIL 20.

Royal Institute of British Architects.—Messrs. W. B. Richmond, A.R.A., Ford Madox Brown, and N. H. J. Westlake, P.S.A., on "Decorative Painting." 8 p.m.

Surveyors' Institution.—Mr. Arthur Vernon on "Estate Fencing." 8 p.m.

TUESDAY, APRIL 21.

Institution of Civil Engineers.—Further discussion on Mr. R. E. B. Crompton's paper on "The Cost of the Generation and Distribution of Electrical Energy." 8 p.m.

THURSDAY, APRIL 23.

Society of Antiquaries.—Anniversary meeting. 2 p.m.

Institution of Electrical Engineers.—8 p.m.

FRIDAY, APRIL 24.

Architectural Association.—Mr. W. Scott Morton on "Method in Colouring." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—(1) Mr. A. Sealy-Allin on "A New Type of Water-Motor." (2) Mr. H. Evington on "Hydraulic Power as applied to Pressing-Machinery." 7.30 p.m.

SATURDAY, APRIL 25.

Architectural Association.—Visit to the Weigh House Chapel, Duke-street, Grosvenor-square.

Royal Institution.—Professor Silvanus P. Thompson on "The Dynamo." III. 3 p.m.

NEW VENTILATING TILE.—Mr. Albert Gower sends us drawings and description of his new ventilating tile for admitting air under floors, the special features of which is that the perforated tile forming the exterior inlet is placed at a higher level than the interior opening, with a short vertical flue connecting them. The advantage is that the exterior inlet can be kept further from the ground, for ventilating ground floor joists, and is thus less liable to become choked with leaves or earth, or to admit damp.

ELECTRIC LIGHT FITTING.—Messrs. Rashleigh, Phipps, & Dawson send us a description and illustration of what they call their "patent ray diffuser" for covering the glass containers of glow-lights. It is a small jacket of beaded glass which can be fitted over the plain glass to reduce the glare without reducing the light.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 6.—By *W. W. Jenkinson*: 40, 42, and 44, Church-st., and 1 to 11, Union-pl., Lee, u.t. 33 yrs., g.r. 16l., r. 209l. 12s., 725l.; 19, Grossfield-lane, Deptford, f., r. 22l. 2s., 160l.; 13 and 15, Giffen-st., f., r. 26l., 324l.; 20 and 49, Arthur st., Chelsea, u.t. 15; yrs., g.r. 9l., r. 87l., 340l.; 4, Selah-pl., u.t. 14 yrs., g.r. 1l. 1s., r. 20l. 10s., 455.; 10 and 12, Little Europa-pl., Battersea, u.t. 51 yrs., g.r. 6l. 2s., r. 40l., 125l. By *Toplis & Harding*: Freehold farm, near Banbury, 127a. 1r. 25p., r. 236l., 5,960l.; freehold grass farm, 40a. 1r. 19p., r. 90l., 2,250l.; 7, Rutland-ter., Pimlico, u.t. 34 yrs., g.r. 8l., r. 45l., 320l.; 3 and 5, Kilton-st., Battersea, u.t. 75 yrs., g.r. 8l., r. 52l., 380l.; 38, 39, and 40, Chatham-st., u.t. 74 yrs., g.r. 9l., r. 65l. 420l.; 36 and 38, Lavender-rd, u.t. 47 yrs., g.r. 9l., r. 60l., 430l. By *Fleuret & Sons*: "The Grey Horse" P.H., Richmond-rd., Kingston, f., r. 60l., 1,900l.; "The Six Bells" f. Beerhouse, Albert-rd, Norbiton, r. 22l., 500l.; "The Jolly Brewers" f. Beerhouse, Canbury-alley, Kingston, r. 20l., 400l.; King Charles-rd., Surbiton, "The Castle" beerhouse, and two cottages, u.t. 13 yrs., 500l.;—By *B. Brown*: 53 and 55, Augusta-st., Poplar, u.t. 37 yrs., g.r. 6l. 10s., r. 48l., 390l.—By *W. J. Newell*: 17 and 19, Ambrose-st., Bermondsey, u.t. 47 yrs., g.r. 7l., r. 57l., 395l.; i.g.r. of 19l., Kentish Town, u.t. 58 yrs., g.r. 5l. 5s., 145l.; i.g.r. of 50l., Shoreditch, u.t. 28 yrs. g.r. 22l. 10s., 320l.; i.g.r. of 19l. 12s., Burton-cres., u.t. 16 yrs., g.r. 1l. 15s., 190l.; 8, Lynton-rd., Bermondsey, u.t. 38 yrs., g.r. 4l., r. 31l. 4s., 270l.; 94 and 98, Lynton-rd., u.t. 47 yrs., g.r. 9l., r. 66l. 6s., 550l.; 9 to 15 (odd), Frederick-st., Hatcham, u.t. 75 yrs., g.r. 12l., r. 83l. 12s., 575l.; 38 and 40, Knowle Hill-cres., and 42, Court Hill-rd., Lewisham, u.t. 77 yrs., g.r. 12l., r. 61l. 2s., 240l.; 23 to 28, Walpole-rd., Bromley, f., r. 106l. 12s., 725l.; 35 and 36, Blomfield-rd, f., r. 41l. 12s., 400l.—

APRIL 7.—By *A. Chancellor*: Freehold Rent of 107l. 10s., Chertsey, with reversion in 72 yrs., 2,125l.—By *E. J. Gardner*: Three Freehold Cottages, East Sheen, r. 54l. 12s., 550l.; F. Cottage, r. 20l. 16s., 240l.—By *Wilkinson, Son, & Welch* (at Brighton), 22, Stanford-avenue, Brighton, f., r. 105l., 1,575l.—By *M. Vigers*: 29, Blackheath-hill, Greenwich, f., r. 39l., 510l.; A Plot of Freehold Land, 150l.; 11, Grove-st. and Cottage, f., r. 46l. 18s., 450l.; 18 and 20, Blissett-st., f., r. 44l. 17s., 450l.; A Plot of Freehold Land, area 7,000 ft., 270l.; 17 and 19, Blissett-st., f., r. 46l. 16s., 600l.; A Plot of Freehold Land, Blissett-st., area 21,690 ft., 510l.; A Plot of Freehold Land, Brand-st., 120l.; 3 and 4, Brand-st., f., r. 36l. 8s., 390l.; 102 to 108 (even), Royal-hill, f., r. 67l. 12s., 830l.; 2, 3, and 4, Topham-pl., f., r. 53l. 6s., 430l.; 80 and 90, Royal-hill, f., r. 70l. 4s., 1,020l.; 27 to 31, Prior-st., u.t. 8 yrs., g.r. 17l. r. 106l. 4s., 240l.; 21 and 22, Royal-hill, f., r. 46l. 2s., 680l.

April 8.—By *J. Griffin & Son*: 15, Scrutton-st., City, f., r. 85l., 1,975; 11, 12, and 13, Clifton-pl., f., 805l.—By *F. Jolly & Co.*: 49 and 51, Gun-lane, Limehouse, f., r. 60l., 600l.; 74, Campbell-rd., Bow, u.t. 71 yrs., g.r. 4l. 10s., 370l.; 2 to 6, Lea-st., and 1 and 2, Kidd's ct., Stratford, u.t. 61 yrs., g.r. 26l., 160l.; 17 to 29 (odd), Sabbarton-st., Poplar, u.t. 61 yrs., g.r. 23l., r. 163l. 16s., 875l.; 11, 13, 19, 21, and 23, Gale-st., Bow, u.t. 33 yrs., g.r. 15l., r. 87l. 2s., 210l.; 8, Calverley-st., Mile End, u.t. 53 yrs., g.r. 4l. 12s. 6d., r. 29l. 18s., 175l.; 10 to 16 (even), Calverley-st., u.t. 53 yrs., g.r. 24l. 7s. 6d., r. 149l. 10s., 860l. By *J. T. Ayton*: 49, Moody-st., Mile End, f., r. 23l. 8s., 245l.—By *Martin Vigers*: A Plot of Freehold Land, Stockwell-st., Greenwich, 450l.; "The White Hart" public-house, London-st., f., 3,400l.; 23 and 29, London-st., f., r. 76l. 12s., 950l.; 31, 33, and 35, London-st., f., r. 117l. 15s., 1,350l.; 41, 43, 45, and 47, London-st., f., 2,010l.; 49, 51, and 53, London-st., f., r. 85l. 16s., 1,300l.; 57, London-st., f., r. 44l. 4s., 780l.; 43 and 44, Royal-hill, f., r. 65l., 810l.; 13, 15, and 17, Royal-hill, f., r. 88l., 1,120l.; a plot of freehold land, Royal-hill, 170l.—By *Ellis, Morris, & Co.*: 89 and 90, Stanhope-gardens, Kensington, u.t. 60 yrs., g.r. 10l., r. 401l. 10s., 6,400l.; 39 and 41, High-st., Sydenham, f., r. 140l., 1,870l.; 77 and 79, Crystal Palace-rd., Dulwich, u.t. 31 yrs., g.r. 12l., r. 62l., 350l.; 9, Western-villas, Southgate, u.t. 75 yrs., g.r. 10l.; r. 56l., 450l.

APRIL 9.—By *Lees & Burchell*: Reigate Mill and Cottages, Reigate Heath, and 1a. 0r. 19p., Copyhold, 1,000l. By *Whittingham & Sons*: 51 plots of freehold land, East Ham, subject to a payment of 542l., 400l.; 8 to 14 (even), Westeria-road, Lewisham, f., 2,600l.; 13, Thornford-rd., f., r. 22l., 310l.; a plot of freehold land, Westeria-rd., 540l. By *Briant & Son*: 30, Komerton-rd., Brixton, u.t. 82 yrs., g.r. 6l., r. 54l. 12s., 300l. By *C. C. & T. Moore*: 30 and 32, Old Gravel-lane, Wapping, f., r. 43l. 8s., 600l. By *T. G. Wharton*: 2 to 8 (even), Longcroft-rd., Camberwell, u.t. 90 yrs., g.r. 27l., r. 168l. 10s., 960l. By *Newbon & Co.*: "Holley Grove House," Staines-rd., Hounslow, and 2a. 1r. 20p., 2,010l.; 34, Haringay-pk., Crouch End, f., 1,250l.; i.g.r. of 3l. 10s., with reversion in 56 yrs., Mount Pleasant-hill, 125l.; 77 and 100, Framlingham-pk.-rd., Hackney, u.t. 48 yrs., g.r. 12l., r. 87l., 800l.; 6, Torriano-av., Camden Town, u.t. 48 yrs., g.r. 7l., 450l.; 3, Havelock-st., Islington, u.t. 64 yrs., g.r. 6l., r. 34l. 9s., 415l.; 74, Gifford-st., u.t. 58 yrs., g.r. 6l., r. 33l. 16s., 275l.; 218 and 220, New North-rd., u.t. 17 yrs., g.r. 8l., r. 63l., 360l.—By *M. Liell*: "Gaysham Lodge," High-rd., Ilford, f., r. 70l., 900l.; 1, Wright's-rd., and "The Essex Arms" beerhouse, North Bow

, Milford-st., Wandsworth-rd., u.t. 39 yrs., g.r. 6*l.* 6s., 28*l.*, 200*l.* ; 74, Crownfield-rd., Stratford, u.t. 87 yrs., r. 4*l.* 10s., r. 30*l.*, 195*l.* ; a plot of freehold land, Rushore-rd., Clapton, 250*l.* ; 79, Churchfield-rd., Acton, f., 28*l.*, 330*l.*

APRIL 10.—By *Jones, Lang, & Co.* : 10 and 12, Orbell-, Battersea, u.t., 84 yrs., g.r. 14*l.*, r. 72*l.* 16s., 455*l.*— *Segrave & Taylor* : 101, Malden-rd., Haverstock-hill, t. 60 yrs, g.r. 8*l.*, 335*l.* ; 26, Maitland-pk.-rd., u.t. 60 s., g.r. 7*l.* 10s., r. 42*l.*, 355*l.* ; 26 and 27, Chiswick-rd., rnham-green, u.t. 78 yrs., g.r. 12*l.*, r. 42*l.*, 350*l.*—By *Holsworth* : 9, 23 to 34 (even), Hassard-rd., Bethnal-reen, f., r. 140*l.* 4s., 1,945*l.* ; 1 to 4, Arline-st., f., r. 101*l.*, 1,300*l.* ; f. house and yd., Bridge-st., Homerton, r. 30*l.*, 0*l.* ; 50, Allerton-st., Hoxton, u.t. 17 yrs., no g.r., 65*l.* ; Casterton-st., Hackney, u.t. 86 yrs., g.r. 6*l.*, r. 35*l.* 2s., 0*l.* ; 37 and 39, Teal-st., u.t. 22 yrs., no g.r., r. 41*l.* 12s., 0*l.*—By *A. Robertson* : "Rye-hill House" and five ots of land, Peckham, 950*l.* ; 25, Ball's-pond-rd., Kingsnd, u.t., 16 yrs., g.r. 6*l.*, r. 28*l.* ; 33, Shrubland-., Dalston, u.t. 50 yrs, g.r. 5*l.* 12s. 6d., r. 34*l.*, 305*l.* ; , Christie-rd., Hackney, u.t. 53 yrs., g.r. 4*l.* 10s., r. 27*l.*, 00*l.*

[*Contractions used in these lists.*—F.g.r. for freehold round-rent ; l.g.r. for leasehold ground-rent ; i.g.r. for approved ground-rent ; g.r. for ground-rent ; r. for rent ; f. for freehold ; c. for copyhold ; l. for leasehold ; e.r. for estimated rental ; u.t. for unexpired term ; p.a. for per annum ; yrs, for years ; st. for street ; rd. for road ; sq. for square ; pl. for place ; ter. for terrace ; cres. for crescent ; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.A.		7 15 0
Oak, Ex.		3 10 0
Quebec 1 S.F.		
Ash, Canadian load	2 10 0	4 5
Larch, do.		4
Elm, do.		3 10
Pine, Dantzic, &c.	7 0	7 10
Oak, do.	2 10	4 0
Canada	4	5
Pine, Continental		3 0
Do. Yellow	3 0	5 10
Ash, Dantzic	4 0	5 0
St. Petersburg	2	7 0
Canada		
Red Pine	2 10	3 10
Do. Archangel		3 0
Do. Riga		3 0
Do. Memel		3 0
Do. 2nd		
Do. 3rd		
Do. Yellow		
Spruce, 1st		15 0
Do. 2nd		
Do. 3rd		
White Sea	3 0 0	10 10 0
Canada, Pine 1st	14 0 0	24 0 0
Do. do. 2nd	9 0 0	15 10 0
Do. do. 3rd, &c.	6 10 0	10 0 0
Do. Spruce, 1st	8 10 0	10 10 0
Do. do. 3rd & 2nd	6 0 0	7 10 0
New Brunswick	5 0 0	7 0 0
Quebec Oak	2 0 0	3 10 0
Do. Pine		
Red Pine		
Do. Spruce		
Lathwood, Dantzic		0 11 0
Do. 2nd		0 9 6
Do. 3rd		0 7 6
Odessa		
Memel		
Gothenburg		
Christiania		
Honduras	5	6
Mexican do. do.	4 0	5
Tobasco do. do.		7
Honduras do.	5	6
Cuba Turkey top	4 0 0	13 0 0
Rose, Rio	10 0 0	20 0 0
Bahia	9 0 0	18 0 0

TIMBER (*continued*)

Satin, St. Do.		
Mahogany	ft. 0 0 10	0 1 3
Pitch Pine	0 0 3½	0 1 3
Walnut, Italian	0 0 4½	0 0 7

METALS.

Iron Bar Welsh, in London	6 5 0	6 15 0
Do. at works	5 15 0	6 5 0
Do. Swedish, in London		6 7 0
Do. at works	6 2 0	7 0 0
Copper, British, cake, tile, & ingot	57 0 0	
Best selected	58 0 0	
Sheet, strong, &c.	0 0 0	
Old cut	52 0 0	
Yellow Metal	0 0 6	0 0 7½
Lead—Pig, Spanish		
Sheet, 5 lbs. and upwards		12 11
Do. Patent Shot		
Do. Red		
Do. Orange		
Spelter, Silesian	12 12 6	
Steel, English		
Swedish, per cwt.	15 0 0	
Tin, Straits	74 10 0	0 0 0
Do. Plates, per box	0 1 10	0 0 0
Do. Australian	90 15 0	0 0 0
English Ingots	94 10 0	

OILS.

Linseed	0 0 11 6	0 0 0
Cocoanut, Cochin	36 0 0	0 0 0
Do. Ceylon	30 0 0	0 0 0
Palm, Lagos	29 10 0	0 0 0
Do. Cape	0 0 0	0 0 0
Cottonseed, refined	0 0 0	0 0 0
Olive	0 0 0	0 0 0
Lubricating, U.S.	6 0 0	7 0 0
Do. refined	7 10 0	12 0 0
Tar—Stockholm barrel	1 1 6	1 2 0
Archangel	0 13 6	0 0 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than 12 noon on Thursdays.*]

BARRY (near Cardiff).—For the erection of fifty-two houses, two shops, Public Hall, Baptist Chapel, and Public-house, Cadoxton, Barry. Mr. W. H. Dowdeswell, Architect, Cardiff :—

Stephens, Bastow, & Co.	£26,700
Alfred Bird	£ 0,814
C. Jones & Co.	0,647
David Davies	0,444
Lowest tender, accepted, Cardiff.	

Messrs. S. & W. H. Stephens, Donegall-place, Belfast :—

W. J. Campbell & Son, Cliftonville, Belfast	£9,000 0 0

* Lowest of seven tenders received.

Engineering, Plumbing, Gasfitting, &c.

Biddell & Co., Donegall-place, Belfast* £1,723 15 0

* Lowest of seven tenders received.

BRISTOL.—For the erection of a new warehouse in Marylepoet, Bristol, for Messrs. Lundrea & Co. Mr. Herbert J. Jones, hitect, Wellington-chambers, 12, Bridge-street, Bristol. Quantities the architect :—

Walters	£1,169	Wm. Church	£[illegible]
Bastow	1,150	J. E. Davis	[illegible]
Stephens, Bastow, & Co.	1,089	G. Humphreys	[illegible]
Perrott	991	W. Cowlin & Son	[illegible]
Stabrook & Sons	950	R. Wilkins & Sons*	899
T. Hatherley	947	* Accepted.	

[All of Bristol].

CARDIFF.—For proposed extension and alterations to the Woodcut School, Cardiff, for the Cardiff School Board. Messrs. Henderson & Salmond, A.M.I.C.E., architects, 32, St. Mary-street, Cardiff :—

R. Waterman	£4,292 10 0	Charles Dunn	£4,529 0 0
Jan Haines	4,234 16 0	Burton & Company	4,188 17 0
Charles Shepherd & Son	4,200 0 0	Henry Davies	4,150 0 0
Lathom	4,812 0 0	E. Turner & Son, Penarth road*	4,116 13 0
David Davies	4,75[illegible]	* Accepted.	
Thomas Gough	4,[illegible]		

[All of Cardiff.]

CARDIFF.—For additions to Board Schools, Rumney, near Cardiff. Mr. J. P. Jones, architect, Cardiff :—

Morton & Co.	£1,290 0 0	G. Griffiths	£1,070 0 0
Davies	1,288 0 7	Gibbon & Hodgkinson	[illegible]
Gough	1,153 0 0	Jones	1,051 0 0
W. Davies	1,100 0 0	A. Elliott	1,042 0 0
Mackell	1,075 0 0	C. Shepherd & Son, Limited (accepted)	1,032 0 0
Davies	1,073 0 0		

CARDIFF.—For drainage, Green Farm, near Cardiff, for Mr. Howell. Mr. J. P. Jones, architect, Cardiff :—

Osmond	£198 18 9	D. Davies	£124 0 0
Larcon	149 0 0	Chas. Shepherd & Son, Limited*	114 0 0
S. Lock	145 0 0		
Jones Bros.	131 0 0	* Accepted.	

BISHOP AUCKLAND.—For providing and laying about 15,396 yds. sewerage pipes and works in connexion with the Crook drainage, for the Union Rural Sanitary Authority. Mr. C. Johnston, Surveyor, 8, Tenters-street, Bishop Auckland. Quantities by Mr. George Bell, 60, Collingwood-street, Newcastle :—

	Section 2.	Section 3.	Section 4.	Section 5.	Section 6.	Section 7.
Thos. Dixon	£ s. d. 1,692 0 0*	£ s. d. 588 0 0*	£ s. d. 220 0 0*	£ s. d. 1,125 0 0*	£ s. d. 220 0 0*	£ s. d. 146 0 0*
Ralph Walker	—	—	—	—	—	434 6 7
Nicholson & Elliott	—	—	—	—	—	660 0 0
George Reid	—	—	348 14 6	992 3 10	624 9 7	641 19 2
George Hector Bell	3,294 0 0	1,600 5 9	336 8 6	1,824 16 0	792 3 0	687 6 4
Joseph Goldsbrough	—	—	279 16 1	—	624 15 0	—
Parker & Sharp	3,816 17 4	1,629 6 6	460 14 1	1,533 15 0	756 10 0	776 12 0
Walkins & Co.	7,690 0 0†			5,940 0 0†		
Jno. T. Simpson	2,315 3 9	1,679 9 4	396 12 8	1,303 0 0	700 2 2	689 6 7
Wm. Lister	3,544 0 0	1,644 0 0	378 0 0	1,482 0 0	905 0 0	672 0 0
Thos. Walton	3,700 0 0	2,000 0 0	400 0 0	1,500 0 0	900 0 0	920 0 0
Riley Hopkinson	5,300 0 0	2,220 0 0	456 7 0	1,785 0 0	1,384 10 0	885 0 0
Jno. Carrick	3,552 0 0	1,300 0 0	310 0 0	1,078 0 0	610 0 0	850 0 0

* Sanitary pipes excluded. † Total for six sections. ‡ Total for six sections, sanitary pipes excluded.

CARDIFF.—For building, paving, and channelling streets, for the Penarth Local Board. Mr. W. Harpur, Borough Engineer, Cardiff. Quantities by Mr. [illegible] :—

T. W. Lloyd	£5,854 14	Richard Sanders	£[illegible]
James Shearer	Incl. in all	R. Williams, Penarth	£[illegible]
T. Davies	£[illegible] 5 0	Cardiff	£[illegible]
T. Griffiths	£[illegible] 0 0	* Accepted.	

CARDIFF.—For stores, for the South Wales Drug Stores, Limited, Cardiff. Mr. J. P. Jones, architect, Cardiff :—

Cowbridge	£1,149	David Davies	£[illegible]
Cardiff	1,089	Chas. Shepherd & Son, Limited	974
Penarth	1,087	Turner & Sons*	[illegible]
Wenvoe Castle	1,062	* Accepted.	

CARDIFF.—For [illegible] for Mr. James [illegible] :—

[illegible]	£[illegible] 0 0	[illegible]	£[illegible] 0 0

SHEFFIELD.—For the erection of two residences at Ranmoor, for Mr. Hy. Augustus Guy. Mr. Herbert W. Lockwood, architect, Church-street, Sheffield. Quantities by the architect

Oxley Bros.	£2,115	0	Jas Holmes	£1,896	0
Jno Robertson	2,050	0	C H Gillam	1,864	10
Jno. Morton	2,000	0	Thos R per. Broomhall		
Chas. Chadwick	1,995	0	[secretd]	1,825	0

[All of Sheffield.]

SHIPLEY (Yorks) For Salvation Army Citadel, Shipley, Yorks. Mr. W Gilbee Scott, architect, 25, Bedford row, Lond n, W C :—
Rhodes Bros, Shipley [accepted]. £1,343 0 0

SOUTHAMPTON For building "Le Dansk" margarine factory, Southampton, for Mr A. P. Bergt, of Paris. M E Brannarius, architect, Paris Mr T. G. W. Allridge, engineer, Southampton

J Thompson	£17,7 s	H Evans	£14,900
W. Ward	16,800	Morgan, Isted, & Morgan	14,772
Jenkins & Son	15,987	T W Saunders	14,700
Kingerlee	15,732	Lewis	14,600
Reed, Blight & Co., Limited, Plymouth*	15,000	T. Dyer & Sons	14,376
W. E. Light	14,920	Bull & Sons	14,277
		T. W. Roe & Co	13,535

* Accepted.

SWANSEA.—For the erection of the Charles Bath Memorial Hall, for the Vicar and Churchwardens of Christchurch, Swansea Mr. T P Martin, architect, Heathfield street, Swansea. Quantities by the architect :—

Jenkins Bros	£1,350	C. Walters	£1,060
Gustavus Bros.	1,146	J. D Williams	1,035
Nelson Joinery Co.	1,109	D. C Jones, Gloucester*	989
Thos. Watkins & Jenkins	1,100		

* Accepted.

TOTTENHAM.—For new infants' school and additions to present schools at Stamford-hill, for the Tottenham School Board. Mr. Charles Bell, architect, 3, Salters' hall-court, E.C. Quantities by Messrs D Campbell & Son

Jackson Bros	£9,222	0	R. G. Battley	£6,682	0
Shepherd Bastow, & Co.	7,845	0	Peirce & Son	6,650	0
Wood & Co.	7,647	9	W Brass & Son	6,647	0
Flew & Co.	7,460	0	C Wall	6,580	0
Chessum & Sons	7,350	0	Allen & Sons	6,350	0
J. Lunzell	7,290	0	J. O. Coxhead	6,289	0
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Vol. LXI. No. 2516. Saturday, April 25, 1891.

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An Addition to an Old House.—Mr. C. E. Mallows, Architect ..... *Single-Page Photo-Litho.*
Central West Door, Lichfield.—From a Sketch by Mr. W. Percival ..... *Single-Page Photo-Litho.*
Sketch in the Choir, Lichfield.—By Mr. W. Percival ..... *Single-Page Photo-Litho.*
Four Old Houses near Leeds.—Drawn by Mr. Albert Dixon ..... *Double-Page Photo-Litho.*

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History of Renaissance Art.

IN reviewing, rather more than two years ago, the first volume of M. Müntz's sumptuous "History of Art during the Renaissance," we observed that he dealt then mainly with the earlier chapters of the Renaissance in Italy, and that there was an implied promise of a future volume which should deal in the same manner with the later Renaissance. This volume is now before us,* a worthy companion to its predecessor, treating the subject in the same full and critical manner, with the same profusion of illustrations which give an additional interest and attraction to a book already valuable enough for the high quality of its literary matter. As the main title of the work is The History of the Renaissance, and "Italy" in both these volumes appears only as a sub-title, we presume the author has formed the ambitious design of treating the same subject in its development in each of the principal European countries. If this intention is carried out on the same scale as the volumes on Italy, the whole will form such a summary of the great artistic period of modern Europe as we have never had before from the pen of a single writer.

"L'Age d'Or" is the phrase which M. Müntz applies to the later Italian Renaissance period, the period characterised, as he says, by the desire to consecrate life to the highest forms of intellectual enjoyment, and which attained to that "perfect equation which humanity had searched after for so many centuries, that reconciliation between the ideal and the reality, between man and nature, that faculty of seeing the beautiful side of everything without ceasing to be profoundly true and human." The superstitions of the Middle Ages had disappeared one by one, "mais il reste encore la foi dans les causes généreuses." From an æsthetic point of view this "perfect equation" of man had no doubt been realised in a perfection which had never been since the Periclean era of Athens, and has never been again since. Perhaps there is still to be realised, in some future era of the world, the still more "perfect equation" of true æsthetic with true *morale;* an equation which never has existed yet, as far as the known history of mankind testifies; and it seems rather a paradox to apply the expression "vrai" to an age which in its political methods had carried the art of systematic lying to greater perfection than is to be found in the history of any other civilised society, and the social life of which was characterised by habitual licentiousness and frequent cruelty and perfidy. Such books as the famous political text-book of Machiavelli, and the autobiography of Cellini, throw a sinister light on the life of the Renaissance period as regarded from the moral side, which it is as well not entirely to forget, though we admit that it does not directly concern the author of a history of art, and in his estimate of the intellectual and æsthetic perfection of the period M. Müntz says no more than the truth. In respect to this he points out the remarkable manner in which this æsthetic refinement of the period showed itself in the most secondary forms of its civilisation. "Voyez ce costume exempt à la fois de prétention et de vulgarité, cette écriture si ferme et si élégante, avec ses caractères ni trop fluets, ni trop massifs; voyez les moins meubles, les moindres ustensiles, tout respire je ne sais quelle aisance et quelle harmonie." In the author's estimate of the significance and beauty of the handwriting of the period we entirely concur; it is, in its finest examples, a handwriting which seems to be the expression of natures at once princely in manners and artistic in feeling. And in regard to works of higher art perhaps it would be difficult to select any one work more typical of the full Renaissance, in its intellectual refinement, than that celebrated female head modelled in wax, in the Musée Wicar, which the author has selected as the frontispiece to his book. We know nothing either of the subject of this bust (evidently a portrait), nor of the artist who modelled it; it remains as a kind of abstract type of the artistic and social refinement of the Renaissance, at once the admiration and the despair of the modern artist.

The question put by the author, how, out of a period so turbulent, so full of internecine warfare and of foreign invasion, there arose an art so calm and equable in its character and so magnificent in its achievements, is no doubt one of great interest, to which we can only here refer in passing. M. Müntz suggests that the ideal character of Renaissance art, founded as it was in the first instance on the passion for the antique in literature and art, tended to render artists and amateurs on the one hand indifferent to patriotism, while it placed them above the level of the political and military conflicts of the day. He points out how ready an artist was in those days to expatriate himself, either to another state or to another land, provided only he found a welcome and a scope for his artistic powers on the new ground. A prince or potentate might be the enemy of the artist's country or clan, but as long as he gave ample patronage and opportunities to the artist, these minor differences in the lower sphere of politics would be cheerfully overlooked by the latter. The Mæcenases of the day, too, though in one respect they entertained a great artist for their own glory and honour, were equally impressed with the ideality of art; they did not require from their artist mere realistic portrayal of their achievements; they were content to leave the painter free to choose his own more imaginative and symbolical method of celebrating his patron. The portrait of the latter introduced into some painting of the hierarchy of Heaven sufficiently answered his demands, without forcing the artist out of the realm of poetic conception. "'Heliodorus chased from the Temple,' 'The Meeting of St. Leo and Attila,' 'The Coronation of Charlemagne;' such is the more or less transparent veil under which are symbolised the expulsion of the French, the interview of Leo X. with Francis I. at Bologna, &c.; nothing is less like conventional official painting." The one drawback to this poetic system of court painting is, as the author remarks, that we lose hereby many records of actual contemporary events and personalities which might in another sense have been of the greatest historic interest. What a set of portraits would not Raphael

* Histoire de l'Art pendant la Renaissance. Par Eugène Müntz, Conservateur de l'École National des Beaux-Arts. II. Italie; L'Age d'Or. Paris: Hachette et Cie.; 1891.

have left us, for instance, had he (or his patrons) been content to employ his genius more frequently on this ground. In the main, however, art has been the gainer by the symbolical system of the Renaissance painters; we have fewer remarkable portraits but more remarkable compositions; less of history but more of imagination and invention in the art of the period.

After the introduction, M. Müntz commences his work by a chapter on the Italian science and literature of the fifteenth and sixteenth centuries, and their influence on art, followed by one on the differences between the art of the two centuries, and the changes in style which supervened. These are very pointedly illustrated by engravings from works of the same class characteristic of the two epochs; "Peinture religieuse au XVe Siècle" for instance, illustrated by Perugini's "Virgin appearing to St. Bernard," and "Peinture religieuse au XVIe Siècle" by Fra Bartolommeo's treatment of the same subject. These are very characteristic examples; the one comparatively stiff in line, with a formal decorative background of architecture; the other far more naturalistic, and marked by a corresponding freedom in the attitudes and draperies of the figures. Botticelli's and Raphael's treatment of the Madonna and Child, on two opposite pages, form an even more significant contrast. Architecture is contrasted in the same manner, the Spannocchi Palace at Siena facing the elevation of a palace design by Bramante and Raphael. In the former we have the flat treatment of the walls, the windows merely arched without mouldings or cornices, but the building crowned with an immense cantilever cornice. In the opposing sixteenth-century design we have the rusticated basement story with round-arched openings, and a delicately proportioned order of coupled columns above, with balustrades and pedimented windows between. It is almost needless to add that M. Müntz's criticism in regard to these is the very reverse of Ruskin's, and that he regards the sixteenth century design as an immense advance upon the comparative rudeness of the other. Without supporting Ruskin, who is of course absolutely and absurdly one-sided in his denunciation of the later Renaissance architecture, we do not think that many English architects will go with M. Müntz's judgment in this case. The broad wall spaces and simple yet bold treatment of the windows in the Sienese building have far more of real architectural grandeur and dignity than the rusticated basement and order of the later architects. The difference between the two is in fact, that the earlier palace is far more a building, the latter far more of a mere design. The first is really expressive building (the true function of architecture), the latter is more like an architectural model. It would look as well in a model as in the actual building; while in the Spannocchi Palace we feel that this is a built design, not a drawn one, and that its effect can only be fully realised with the scale and the masses of wall of the actual construction.

The third chapter deals with tradition and the effect of the antique upon the modern art. The early Renaissance artists had kept the balance equal between nature and antiquity. With the latter school antiquity obtained the upper hand, especially with the architects, under the double influence of the ancient ruins and of Vitruvius. In the succeeding chapter the subject of realism is considered; realism in the choice of subjects, the treatment, and the execution. Of the first there was certainly little enough in the later Renaissance period. As to realism of treatment we have contrasted "The Crucifixion" by Donatello, treated in what now appears a stiff and almost decorative manner, and "The Descent from the Cross" by Raphael, in which the attitudes and efforts of the men engaged in lifting the body from the Cross are pourtrayed with a realism which rather sets on one side the real pathos of the subject. To Donatello himself, perhaps, the treatment of the subject of the crucifixion was realistic; that is to say, it was not intentionally conventionalised. He treated it, possibly, with as much realism as was possible at the time, and his flat arrangement of the group of kneeling figures at the foot of the cross arose in great measure from the fact that he had not technical skill to group them otherwise. The flat style of Donatello's execution in bas-relief, the very low relief employed in most of his works, was perhaps a matter of æsthetic choice; but it is very doubtful if the actual composition was so. In looking at his works it is difficult to avoid the impression of their greater seriousness and devotion of spirit; but it is probable that this is only the effect of our association. The arrangement and attitudes of actual life are not obtruded on us, so that a sense is produced of the work being restrained and tempered by a religious veneration which forbade the artist to indulge in a too vivacious imitation of nature; but it is very probable that this is only an illusion produced on one's mind by the comparative stiffness and want of movement in the figures. The same effect of religious sentiment is produced by the works of Giotto, with their rather naïve attitudes and stiff limbs, yet what we have recorded of Giotto goes to show that he was a man of rather light and jocular character. The same may be said of Albert Dürer, whose character and manners, as pourtrayed by records of his life, are oddly at variance with the solemn character of his style and subjects. M. Müntz does not touch on this view of the question, which is rather important, for it is a matter of great interest whether the early painters really had any desire to treat sacred subjects with a conventional reserve and artificiality of style, or whether in truth they did not do their best to reproduce nature, and would have gone further in that direction had their powers allowed them to do so. We are inclined to think the latter is the real state of the case.

In the second book of this volume, headed "Les Mécènes," the author considers the whole question of the position of artists and the patronage and opportunities afforded them, in the principal cities of Italy, Florence, Siena, Rome, Venice, Mantua, &c.; to each of which a separate chapter is devoted; the general object being to depict the conditions under which the artists of the Renaissance lived and worked in these various localities. This is of course both an important and a difficult study, which in fact would require far more space than is devoted to it in this book, where it can only be regarded as touched upon in outline, though there are valuable remarks and illustrations to be met with in these chapters. After this we come on what is the main object of the volume, though only occupying about two-thirds of it viz.: the consideration of the development of the arts of architecture, sculpture, painting, and decorative art during the later portion of the Renaissance period.

Of these the first and largest place is given to architecture—"Constatons d'abord," says the author, "que l'architecture, aujourd'hui le moins populaire des arts, passionnait alors au suprême degré petits et grands." Great men delighted in building, and architects rose proportionately in public favour. This was partly due, it is suggested, to the great genius and high position of Bramante, Michelangelo, and Raphael, the first of whom was specially an architect, the two latter practised the art to a certain extent. This appearance of architect-painters is chronicled by M. Müntz as another sign of the times. In the earlier days we meet more often with architect-goldsmiths, and architect-sculptors; it is in the sixteenth century that the architect-painter comes to the front. Perhaps this fact is in reality rather at variance with the author's view of the popular importance attached to architecture. It may perhaps rather be open to this explanation, that the immense popularity of the art of painting, and the consequent brilliant position attained by the great painters, led to their being looked up to as the chief power in all the arts, and consulted about architecture accordingly. M. Müntz draws attention to a very significant change in the style of addressing artists, which came in along with the great success of men like Raphael and Michelangelo. Formerly the artist had been "Maestro" So-and-So; now he was "Messer" or "Messire"; a change of style which the author characterises as "more than a change in etiquette; it was a revolution in manners." The artist in short was formerly a craftsman, he was now a gentleman, in social position and consideration; and no doubt it was to the proud social position occupied by such painters as Titian, Raphael and Michelangelo that this change in their social estimation was to a great extent due. Whether the entrance of the painter-architect on the scene was the best thing for architecture may be doubted. Sculpture is to a certain extent allied to architecture; there is a constructive element in it which is absent in painting, and an artist trained mainly as a sculptor is much more likely to have an insight into architectural construction than one trained as a painter. Raphael invented no doubt admirable architectural backgrounds to some of his paintings, but in the matter of St. Peter's it is abundantly evident that Bramante, who was more especially trained as an architect, understood the constructional problem, if not the matter of architectural design, far better than either Raphael or Michelangelo.

Among the points noted by the author in his chapter on architecture, is the persistence of the old habit of making a model of the building before execution. "Les tracés géométriques ou pittoresques ne suffisaient pas à la Renaissance; elle voulait toucher et sentir"; and thus architectural design in its initiative became something like a branch of modelling or sculptor's work; hence another reason for the superiority of the sculptor-architect. The rustic treatment of material becomes less in favour in this era; the windows become rectangular openings regularly spaced; ornamented with considerable variety of architraves and entablatures, but more formal and symmetrical than the window treatment of the preceding century, in which a semi-Gothic feeling still prevailed. In regard to the planning of the churches of the period M. Müntz defends the Renaissance form of church (which in reality wants no defence) on the rather curious ground that it left the architect free to treat the plan as he pleased, whereas Gothic bound him down to a fixed type of plan; the view of a critic who has not much studied Gothic and obviously does not sympathise with it. However, the author does something to support his thesis of the superior adaptability of Renaissance architecture by the interesting series of comparative plans of churches which he gives. Monumental Architecture ("Architecture funéraire") occupies a considerable space in this section; as M. Müntz truly says, it would require a chapter to itself. The importance attached to monumental designs in the Renaissance period, and the amount of splendid artistic talent bestowed on them, is indeed one of the most remarkable characteristics of the time.

In the long chapter which he dedicates to Bramante, the author takes much the same view of the genius of the great Renaissance architect as that which has been formulated by the special modern student of his works, M. de Geymüller, upon whose researches, in fact, the chapter seems to be a good deal founded. If the projects of Bramante had been carried out, he observes, the Rome of the Popes would have rivalled ancient Rome in the boldness and grandeur of her architectural monuments. "Tout en ne paraissant qu'imiter les anciens, il créait un style à lui, plein de jeunesse, de grâce et de fierté, aussi différent du style romain que celui-ci pouvait être du style grec." In regard to Raphael, who succeeded Bramante as architect to St. Peter's, one must agree with the author that Raphael the painter has eclipsed Raphael the architect; but it is evident that Raphael undertook the responsibility of St. Peter's with the greatest enthusiasm and confidence. The following quotation from a letter addressed by him in

July, 1514, to his uncle Simone de Ciarla, is interesting as showing the importance he attached to this great work:—

"In regard to my stay at Rome, I cannot, for love of the work at St. Peter's, remain anywhere else for long, for I have the situation of Bramante, and what place in the world is worth more than Rome! and what enterprise more worthy than that of St. Peter, which is the first temple of the world! It is the greatest edifice I have ever seen, and will cost more than a million of gold. Bear in mind that the Pope has resolved to spend 60,000 ducats annually on this work; he will be content with nothing less. He has joined with me as colleague a very learned "frate," at least 80 years old; seeing that he has not long to live, he has given me as companion this man of great reputation and learning, in order that, if he has any important secret in the matter of architecture, I may learn it and thus arrive at perfection in his art. His name is Fra Giocondo. The Pope sends for us every day, and converses with us for some time on the subject of this construction."

It is sad to reflect that all this enthusiasm was practically thrown away. The very learned but aged Fra Giocondo died soon after, and Raphael, unable to cope with the practical difficulties of the work, also died before he had advanced the great work in any important particular. In this case alone, perhaps, his genius and his confidence were misplaced.

A succeeding chapter on the Tuscan architects deals with the work among others, of San Gallo, Cronaca, and Giorgio Martini, including among the illustrations two devices by the latter which are highly characteristic of the Renaissance. One of these is a diagram of the derivation of the Ionic capital from the proportions of the human head, with a flat tile over it supported by the volutes dotted as rolls on each side of the head; the other is a plan of a basilica reproducing the proportions of the human figure, which is sketched within the lines of the plan. In such unproductive fancies did some of the Renaissance architects indulge themselves, and it is not surprising that under the domination of such ideas they sometimes lost their way in the practical part of architecture; but the incident is interesting as indicating the importance attached to the human figure as the central object and *modulus* of all artistic design.

In the chapter on sculpture which follows there is a very able and thoughtful criticism of Michelangelo, whom the author regards as more indebted to ancient art than is sometimes supposed, though imparting to all his work a vigour and originality of his own; not of course the ancient art of the Greeks, of which he knew nothing, but of the Romans, especially as exhibited in such work as the Laocoön. In Michelangelo's greatest sculptural works, however, the two Medici monuments, he certainly went far beyond any Roman sculpture we now know of, especially in the magnificent female figure of "Dawn," which is nearly as calm and as broad in style as the Parthenon sculpture, and with more of intellectual interest and expression. The Sibyls of the Sistine Chapel also show, in painting, much of the repose and beauty of line of Greek art, again with a deeper feeling than the Greeks knew of. Had Michelangelo known the Parthenon marbles, he would perhaps have done still greater things; he would certainly have recognised in them a genius worthy of his adoration.

We must pass over the remainder of the chapters on sculpture and painting, and give merely a glance at the final one on decorative art, a sphere in which the artists of the Renaissance were not altogether so successful as in sculpture and painting, at least as regards good taste, though the same *verve* and richness of fancy were illustrated here as in the greater arts. The author suggests that the power and freedom in treating the figure, which had become so conspicuous among the great painters of the time, had given rise to a passion for figure design which led decorative artists to design almost every ornamental detail in some semblance of a living thing; geometric designs, or those derived from vegetation, being comparatively neglected and regarded as deficient in



A Renaissance Centrepiece.

life and movement. Hence arose that strange medley of grotesque beings and chimeras with which Renaissance ornament is filled, arising out of a passion for putting the semblance of life and the reminiscence of the figure into every detail, the bad taste of which is only partially redeemed by the wealth of invention and ability in design which they display. In this case, as M. Müntz observes, we may find that the incessant influence of the great arts upon the lesser ones is not without its disadvantages. A greater simplicity of aim, a less ambitious desire to raise their decorative design to the level of sculpture and painting, would have left the decorative artists of the Renaissance free to exercise their taste in a less *outré* and more reasonable manner. In spite however of the unquestionably bad taste of much of this ornament of intermingled griffin and satyr heads, of legs without bodies, bodies with grotesque faces on them, and all that wild medley of incongruities, the vivacity of design and execution in much of this work is so remarkable that we can hardly wish it undone; we can only guard against being corrupted by its false taste, while admiring its vigour of conception and execution. And when we do come on a rich example of Renaissance work in which these faults of artificial grotesque have been avoided, then indeed we find a combination of richness of effect with refinement of line such as hardly any other school can show us. The frontispiece to the Breviary of Mathias Corvin, given as one of the illustrations to this chapter of the book, is a truly remarkable example of the higher class of decorative work. Amid a wide border of rich flowing foliage are panels with small, beautifully-designed figures, while little genii play in the scrolls of the foliage; the centre is occupied by an architectural alcove in perspective, with sculptured figures of angels supporting the slab with the title at the back of the alcove; at the sides are seen dignified personages in long draperies looking inward at the inscription. It would be difficult to get more of decorative beauty and intellectual suggestion into a mere title-page ornament. The throne of Giulano de Medici, another illustration to this chapter, is one of the few Renaissance designs in which figures have been avoided; it is remarkable for its combination of elegance with dignity and richness of effect; and the manner in which the front riser of the seat is slightly curved in to keep it back from the feet, while entirely a practical detail, is so managed as to add beauty and character to the whole design.

In summing up briefly the characteristics of the "Golden Age" of the Renaissance, M. Müntz concludes by remarking upon the cosmopolitan nature of its art. The great Italian artists of that period aimed at rising above the accidental influences of place and local habit, and developing an art high enough to unite all people in one common artistic faith. And it must be admitted that they for a time succeeded in this; they drew the civilised world after them, and perhaps it is not too much to say, as the author does in his concluding sentence, that they have shown that the pursuit of an artistic ideal common to all people and to all ages is not merely a utopian dream. Certainly it seems, in spite of the denunciations of Ruskin, that the spirit of Renaissance art has a wonderful power of revival; and at this moment, after having been exposed to the scorn of a whole generation of mediævalists, it seems to have raised its head among us again, and resumed its sway over modern art, as vigorously as if it had never been declared to have been hoplessly dead and done with.

London's Growth.—During the year ending March, 11,097 new houses were erected in London. The total number of houses is now 771,413.—*The Star*.

The Junior Engineering Society.—At a meeting of this society, held on the 17th inst., a paper on "Concrete and its Uses," was read by Mr. F. R. Taylor. The characteristics of the matrix and aggregate were considered, and attention was drawn to the principal examples of the more important artificial stones. The paper concluded with some observations on the utility of concrete in fireproof construction, and samples of concrete, &c., from Messrs. Nelson & Co., Messrs. Lascelles, the Victoria Stone Company, and Stuart's Granolithic Company, were exhibited in its illustration.

Pulpit, St. Marie's Church, Sheffield.—A new pulpit has just been erected in St. Marie's Roman Catholic Church, Norfolk-row, Sheffield. The cost of the work has been £280. The pulpit was made in Holland, by Messrs. Oor, of Roormond. It stands on the south side of the nave. It has a sounding-board, surmounted by a canopy terminating upwards in a number of pinnacles, which are dominated by one in the centre. The wood throughout is of Austrian oak, and is carved, and also decorated with gilt. A panel in the front is filled with a group of carved figures, in bold relief, representing the Sermon on the Mount. The panel at the side represents the first sermon preached in England. There is another carving behind where the preacher stands. This shows Christ as the Good Shepherd. On the under part of the sounding-board is a representation of the holy dove environed by rays.

NOTES.

IN reference to the account we gave in a "Note" last week as to Dr. Dörpfeld's view of the construction of the Megalopolis theatre, another account which we have received from an exceptionally competent witness entirely denies the existence of the fillet or rising on the upper step on which Dr. Dörpfeld apparently relies for his theory that there was a wall formerly built on this step. Our informant states that there is traceable here and there along the step a more or less distinctly marked line, where something has rested on it, either a coping or another step, but that the raised fillet shown in the sketch communicated to us in support of Dr. Dörpfeld's view does not exist in the sense implied. Moreover we are informed that the foundation on which the steps rest is of such a nature as to preclude the idea of a wall having been erected on the steps, as the foundation would not support the weight of a wall. Further and fuller information will, we have no doubt, be forthcoming before long.

IT appears that the Joint Committee engaged in considering the subject of railway rates are content to accept most of the conclusions arrived at by the Board of Trade, amendment after amendment being brought forward, only to be rejected. Numerous and complimentary as have been the remarks made on all hands as to the patience and ability displayed by the officials of the Board during the inquiry, none of these eulogies speak more eloquently than the fact that the Committee were occupied the whole of Wednesday in last week discussing various amendments upon the question of terminals, with the result that the clause under consideration was left precisely as proposed by the Board. The following days' proceedings resulted in an important proviso being added to the clause relating to station terminals, which now stands as follows:—"The maximum station terminal is the maximum charge which the company may make to a trader for the use of the accommodation (exclusive of coal drops) provided, and for the duties undertaken for which no other provision is made by the company at the terminal station for or in dealing with merchandise, as carriers thereof, before or after conveyance. Provided that the actual sum chargeable as station terminals in respect of each consignment shall be such reasonable sum, within the maximum, as shall in case of dispute be determined by an arbitrator appointed by the Board of Trade." It will be seen that the concluding proviso affords a check upon excessive charging, beyond that imposed by the fixing of a maximum. At the opening sitting this week the railway companies attempted to enlarge the scope of clause 5, which empowers them to make special charges for special services. It was sought to include the term "accommodation," but, as in the case of terminals, after a discussion lasting nearly the whole of the day, the amendments were eventually rejected.

IN regard to the request put by M. Vaudremer to the Société des Artistes Français, that the illustrated catalogue of the *Salon* might henceforth include illustrations of architecture, M. Bailly, the President, has replied (according to *L'Architecture*) that the Société has officially nothing to do with the publication of the illustrated catalogue, which appears to be in the nature of a private speculation permitted only by the Société, but not published by their authority. It seems to remain therefore for the architects to consider whether they can persuade the publishers of the illustrated catalogue that the additions of illustrations of the architecture will add to its saleable value. There may be some hope of this in Paris; we fear there would be little in London. At present the illustrated catalogue of the *Salon* (which is purchased by many visitors under the idea that it is the authorised catalogue) does not include even the list of subjects and authors of the architectural designs, all mention of which is omitted. M. Bailly however, promises that in future it shall be required that this permissive catalogue should be published under the title, "Catalogue illustré des sections de peinture et de sculpture du Salon de ——," in order to avoid any misconception as to the real contents of the volume. It is to be hoped that some means will be found of procuring the addition of the architectural designs to the scheme of this very attractive catalogue.

IN this month's number of "The Journal of the Franklin Institute," appears a very sensible note by Mr. William McDevitt on "Some dangers in Electric Lighting." Mr. McDevitt, who is an Inspector of the Philadephia Board of Fire Underwriters, says that "after several years' experience in noting the dangers occurring in the use of electric lighting, it has been clearly demonstrated that in nearly every case the accidents resulted through ignorance both on the part of the workmen engaged in installing the wires and the lessee to whose care the new apparatus was entrusted." The author considers that the chief risks are from lightning, bad joints, and faulty fuses. Lightning is a source of danger from which the public in England are practically free, as in all large towns overhead wires either have been, or will be, done away with. The risk from bad joints is one which ought never to exist, and we certainly do not think that it is the custom in this country for even the most careless workmen to rely upon solder for the continuity of the metallic circuit as they appear to do in America, from Mr. McDevitt's account. Certainly this can never be the case in any installation where there has been even the most superficial superintendence over the jointers. The want of security afforded by fusible connexions, the author says, arises from the variety of alloys used, some of which, owing to the high specific heat of the substance of which they are made, are slow to rise to fusing point, others again become exceedingly brittle when raised to a comparatively moderate temperature, the result being that the circuit is cut out simply from mechanical weakness in the fuse and not from the rise of temperature due to the excess of current. These constant breakages naturally lead, in many cases, to people bridging over their fuse box with a piece of ordinary wire, instead of replacing a broken fuse by a new one, thus rendering the fuse box entirely useless.

THE *Lancet* published last week a report on the sanitary condition of Esher, from which it appears that the neighbourhood has suffered seriously for a time through connecting houses with the new drainage system before the arrangements for flushing and ventilation were completed. The result was that on nearing a manhole of the sewer the passer-by "had to cut his way with a stick." The previous state of Esher is quoted as a formidable example of the cesspool system at its worst. It is stated that in many cases no attention was paid to emptying a cesspool till it overflowed.

WHATEVER may be the result of the Bill for the extension of the Manchester and Sheffield Line to London, there can be no question that the enlargement of Baker-street station is absolutely necessary. This work indeed has just been commenced. It ought to have been both begun and completed some time ago. The rush of passengers at the present narrow platforms is both inconvenient and dangerous. It should also be pointed out that the main line platforms are inadequate for the morning and evening traffics, and something must sooner or later be done to them. It is questionable whether the police should not make a stand against the inconvenience caused to the traffic in the Marylebone-road by passengers and luggage being turned on to the street because there is no proper entrance to the station for outside traffic. The present plan cannot go on much longer without increasing the inconvenience to the public at large.

IT is clear from the remarks of Sir John Kennaway, M.P., at the opening of an inquiry by a Parliamentary Committee of which he is chairman, that Mr. Hanbury's ruling as to counsel not being allowed to cross-examine a witness unless present during the examination-in-chief will not be followed by all the chairmen. The rule of 1861 seems to be considered by Sir John Kennaway as one only to be employed in case counsel abuse their privileges unduly. The result is, therefore, that counsel will probably endeavour to attend to the examination-in-chief of witnesses more than they have lately done, but that no real change in the procedure of the Committees will take place. If clients in each Committee-room desire the services of eminent leaders, who are few in number, it is obvious that they must to some extent only thank themselves if they do not get the full attention they would like.

AT their meeting on the 9th inst., the Court of Common Council resolved to offer the site and buildings of old Farringdon Market for sale as a whole, as soon as existing market rights shall have expired next year. The new fruit and vegetable market is in course of being built—after the designs of Mr. Alexander M. Peebles, City Architect—in Farringdon-road.* The old market was built in 1828-9, by William Montague, a predecessor in office of Mr. Peebles, and cost nearly 250,000*l.*, according to Timbs's "Curiosities of London." The prosperity which it enjoyed some thirty or forty years ago has quite dwindled away, owing in measure, perhaps, to the diversion of trade to Covent Garden, the Borough, and Spitalfields Markets. The site stands within the parishes of St. Andrew, Holborn, and St. Bride, Fleet-street. It was lately proposed to utilise a portion for a People's Institute and Library, in connexion with the charities of the latter parish, and aided by a grant from the Charity Commissioners out of the general fund under the City of London Parochial Charities Act, 1883. That project fell through, because, as we are informed, too high a price was asked for the ground. The St. Bride's Parochial Charities are estimated to be worth about 2,000*l.* a year. They will now be devoted, it appears, to a similar but smaller institute, for which a site has been chosen in Bride-lane near to the church, and to the school-house, erected in 1840, still distinguished by figures of a boy and girl on its front.

WE have received a collection of pamphlets and papers giving a description of what is called an electro-pneumatic action for the organ, patented by Mr. R. Hope Jones, of Birkenhead, and practically illustrated in an organ which has been erected in St. John's Church, Birkenhead. Unfortunately the papers furnished to us convey no technical or scientific information as to the precise method of action employed. What we do gather is that nearly all the ordinary bulk of mechanism in the organ has been done away with; that the keyboard, connected with the organ by an electric cable, can be moved about and placed anywhere in the building (this is not new, however), and that very novel and ingenious arrangements have been made for bringing all stops on the organ into connexion with any keyboard at pleasure; in fact it appears that the keyboards are quite independent in regard to the pipes, and any combination of them can be brought on to any keyboard with a mere touch to the stop key. The stops are not actuated by draw-stops to be pulled in and out, but by touching small plates connected with the electric action, and a number of stops can be placed on or off by a mere sliding movement of the hand across the plates. This seems all very

* See the *Builder* of September 13 and November 1 last.

convenient, and deserves attention. The idea suggested, that different parts of the organ may be placed in different parts of the building, so as to get rid of the necessity for providing a large space or "chamber" for it in any one position, is not one to be encouraged. "Organ-chambers" as usually built are no doubt very objectionable, and are the ruin of the effect of the organ. But an organ is after all one instrument, and should be concentrated, not cut up into pieces and scattered over the church; and any such system would be a great misuse of the facilities afforded by electric action.

THE visitor to the Society of Water-colours' Exhibition, which opened this week, will experience on entering the room a sense of a marked change in the general effect of the room, arising from the adoption of either close gold frames, or gold mounts to all the pictures, where mounts are used, the white card mount having been discarded. We doubt whether this is an improvement to the effect of the drawings. The exhibition is a very good one, though one or two eminent artists are less well or less fully represented than usual. Mrs. Allingham, who only exhibits two drawings, has probably been reserving others for her special exhibition at the Society of Fine Arts next week. Mr. Alfred Hunt is keeping a little too often to Windsor Castle and Sonning Bridge, of both of which we have seen a good many editions now. We have only space to notice a few of the more prominent works. Mr. T. M. Rooke has been making a series of excellent architectural subjects out of the venerable town of Troyes; various portions of the cathedral, street views, &c., all admirable examples of architectural water-colour drawing, of which the "South Doorway, St. Jean au Marché" (71) is perhaps the finest, but all are worth attention. Mr. Thorne Waite's "Late Autumn" (24) is a beautiful study of landscape. "In an old Garden" (47), by Mr. E. R. Hughes, is remarkable for the beautiful painting of the face of the young lady seated in the foreground, who forms the main element in the picture. Mr. Charles E. Fripp has done well with some studies of architecture and figures in China and Japan. Mr. Herbert Marshall's "January 1891" (63) is an exceptionally fine view of Westminster from the opposite bank of the river, with masses of ice floating on the water. Sir John Gilbert's "Knight Errant" (65), a man in armour seated while his charger drinks from a pool, amid a grand and romantic landscape, forms a fine suggestion of a reminiscence from the "Faerie Queene." Mr. Tom Lloyd's "Five o'clock in the morning" (51), a long picture composed in a rather decorative manner, seems intended as a companion to a former work in which an evening scene was treated in the same kind of manner; a horizontal composition of river, bank, and groups of figures passing along the bank. Mr. Clarence Whaite exhibits a fine series of paintings of snow scenes in the Welsh mountains. Mr. Tom Lloyd's "The Last Load" (77) is perhaps a finer work in colour than the one above-named; the figures grouped on the bridge are carefully studied, and the whole effect of the landscape under warm evening light is very beautiful. Mr. J. W. North's "Gleaners Coast of Somerset" (67) is a large and fine landscape broader in style and less mannered than is usual with him. Mr. G. A. Fripp's "Head of Loch Avon" (110) is a larger drawing than he has usually exhibited of late, and a work of a very high class, remarkable for the soft atmospheric effect which pervades. Mr. Goodwin's "The Explorers of the Island of Sounding Cymbals" (114) has that air of romance which he imparts to these imaginary subjects, and the gleam of bright sunlight on the hillside is magical in effect. He exhibits, among several other works, a remarkable night view of "Lincoln" (201); possibly rather too blue for an English night. Mr. R. W. Allan's studies of old buildings are all powerful and original in style, "A Watch Tower" (133) especially. We noticed especially also "In Bampton Dale" (158) by Mr. Eyre Walker; "Summer" (180) by the same artist; "The road to the Farm" (178) by Mr. Norman Tayler; "The procession of Corpus Christi, Toledo" (184), a remarkably clever "impressionist" work by Mr. Melville, but the sky through the openings in the awning is hardly bright enough to convey the idea of glaring heat; and Mr. Poynter's "Under the South Downs" (205), a garden scene full of light and freshness.

THE exhibition of drawings of scenes in India, by Mr. Mortimer Menpes, on view at Messrs. Dowdeswell's, seems to depend very much on the decorative treatment and arrangement of the frames, the pictures appearing rather as accessories. The magnificent manner in which the artist announces that "I again come before the London public as an interpreter of the life and colour and customs of an oriental land" implies an estimate of the value of his own work which we fear will not be generally concurred in. The colour sketches are slight to a degree; impressions merely. The pencil sketches are more satisfactory, as they give very well what pencil can give in a slight sketch, and their style is good, as sketches; the same may be said of the dry-points. In some of the sketches of Cashmere village buildings there is a curious similarity with the style of some old English picturesque houses; projecting bays, for instance, unpierced except by one large window occupying the whole upper part of the bay. The most interesting point in the exhibition is the small collection of subjects (chiefly heads) engraved with an etching needle upon ivory, a kind of dry-point on ivory. This is, we believe, entirely new, and the effect is very good, and worth the attention of artists.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE twelfth ordinary meeting of this Institute for the present session was held on Monday evening last, at 9, Conduit-street, Mr. J. Macvicar Anderson (Vice-President) in the chair.

The Late Mr. J. D. Sedding.

The Chairman: I am sure that none of us anticipated, when we met here a fortnight ago, that the very day after, we should lose one of our number who had endeared himself to many by his genial qualities, and who had won the admiration of all by the originality of his genius. I allude, of course, to our late friend, John Sedding. The Council have expressed their sense of the loss they have sustained by sending a letter to his wife; but it is one of the mysterious dispensations of Providence that that letter never reached her, for she followed her husband in a few days. The President has sent me a letter referring to this matter, and also to the death of Mr. Cavendish Bentinck, which I will read as being very much better expressed than anything I can say. Mr. Waterhouse's letter is as follows:—

"If I had been with you I should have liked to have said a word or two about the sorrow we all feel at the death of our gifted Member of Council, John Sedding. He was cut off in the midst of a brilliant career. The works he had already accomplished show the extraordinary versatility of his powers, and gave promise of even greater work to follow. At forty-five he retained the enthusiasm of twenty, and those who knew him best are the loudest in his praise, both as an artist and as a man. His amiability, conscientiousness, and high principles made it a privilege to call him friend.

There was another sad duty I had to perform, in mentioning from the chair the death of the Right Hon. Cavendish Bentinck, our Honorary Member. His enthusiasm for the works of Sir Christopher Wren was well known, and one of his latest acts was to employ the good offices of the Council on behalf of one of Sir Christopher's minor churches. Mr. Bentinck had the courage of his opinions, and hit hard when he thought there was occasion for it. We have many of us, I doubt not, come under his lash, but I think we must all confess that his watchfulness over everything that touched the preservation of works of architecture which he thought most commendable commands our sincere respect.

The meeting will much regret with me the absence of Mr. Ford Madox Brown, who had so kindly promised to read us a paper to-night. Mr. Brown, I regret to say, has been seriously unwell, and is to-day ill in bed. He has, however, most kindly written me, at my request, a letter, which I send herewith, explaining the method employed by him in painting the series of pictures illustrating the history of Manchester, for the Corporation of that city, in their Town-hall. He entered in an enthusiastic and self-sacrificing spirit into my anxiety that the artist employed should do his work on the walls themselves; he gave up his residence in Fitzroy-square in order to live in Manchester, and certainly produced a very remarkable series of pictures, of which Manchester is justly proud, for they are one of her greatest possessions. I also have cause for gratification in that it was my business to prepare the casket for the reception of such jewels. I may here observe that the panels were originally prepared for pictures in the water-glass process, and that was why Mr. Brown found them too impervious for the medium he employed, which consists of copal varnish, spike oil, wax, and gum eleni. A. WATERHOUSE."

It is with very sincere regret that I have to intimate to you that the President is unable to come down to-night, he having a very severe attack of cold.

Mr. Ralph Nevill said he had been asked by Mr. R. Herbert Carpenter, the Vice-Chairman of the Art Committee, to express to the meeting his regret at not being able to be present to express the regret of the Art Committee at the loss of their Chairman, Mr. Sedding. The Art Committee had already expressed in their annual report their sense of the great loss they had experienced in losing a chairman of Mr. Sedding's energy and enthusiasm. He had the pleasure of proposing him as Chairman of the Art Committee, and he was sure they had all felt on that committee that they had gained enormously by the enthusiasm which he had thrown into it. In their Chairman for the time being they had a proof that men of great abilities would sometimes give up their time for the advantage of their brethren. They had in Mr. Sedding the case of a man of large practice, who was willing to give up his time to forward the interests of the Institute and its members, and he thought they should acknowledge that service which he rendered to the Institute on this occasion.

Mr. John Belcher said that the President had admirably expressed what must be the feeling of every member of the profession. Mr. Sedding was one of those men whom they could ill afford to lose. The buoyancy and the freshness of his designs were such that every one watched with the keenest interest the development of his art. He was a man of considerable capacity. As they all knew, he was a man whose knowledge and sympathy with kindred arts and crafts was very great, and, moreover, he was a man who not only designed, but worked out his designs with the greatest success. He also wrote many papers of a very high tone indeed. There was a work of his now in the press, of which he had only just managed to complete the revision of the proofs, and he was sure it was a work that would prove of very great interest and value to them all. But the quality which endeared him to all who knew him, was that intense enthusiasm which he had for all art, combined with his genial and pleasant manner, which could not fail to make him beloved by all. In fact, he thought they all felt that they had lost a true friend and a dear comrade.

Professor Aitchison said that no architect who had ever seen the works or drawings of Mr. Sedding could doubt for one moment his extraordinary originality, and there were many gentlemen present who could speak on that point. He was the most eloquent and enthusiastic man he ever came across.

Old Staircase, Tullie House, Carlisle.

Mr. Nevill stated that he had received a letter from Mr. Ferguson, of Carlisle, along with a petition in favour of the preservation of a fine old staircase of great date at Tullie House, Carlisle. The petition was accompanied with a great number of documents, which he thought served to show that there was no necessity to destroy this staircase, and that it was very desirable that it should be retained.

The Chairman said any of the members who desired to do so could sign the petition at the close of the proceedings.

Papers on Decorative Painting.

The Chairman then called upon Mr. J. M. Brydon to read an introductory paper to those which were to follow from Professor W. B. Richmond, A.R.A., Mr. N. H. J. Westlake, and Mr. Ford Madox Brown. Unfortunately Mr. Westlake and Mr. Madox Brown were unable to be present through illness, but their communications were read for them.

Mr. Brydon, in the course of his paper, said

there was very much painting that was not decorative. The astonishing thing was that under the present circumstances there should be any at all. But they saw a little good decorative work now and then, which came to them like a breath from Eden, and they had to consider what to do with the beautiful stranger. He said beautiful, because to be decorative it must be beautiful, and dainty, and lovable with all. To be beautiful it was of the utmost importance that it should be in harmony with its surroundings. In itself decorative painting was simply the enriching by means of colour and design the work of the architect. Hence it must also be in sympathy with the architectural style of the building; yet never so obtrusive as to destroy the picture which it adorned. It must also be appropriate not only to the building generally, but to the apartments therein, and in particular to their situation, their aspect, and their materials, and in order to secure those results it became doubly essential that the architect and decorator should acquire a knowledge of each other's work. It might be admitted that they had made great advances in decorative work of late years. He pleaded for an intimate relationship between the arts of painting, architecture, and sculpture. The panels of a wall, or the surface of domes and ceilings, presented themselves for figurative subjects, and their surroundings must be carefully harmonised therewith, and so treated as not to look like holes in the wall. Again, they must be in sympathy with the surface on which they were painted. The scale also of the figures must bear some relation to the architecture of the interior. Many a fine interior had been ruined by inattention to this first principle. He said nothing as to particular colours to be employed. It was with painting as with music—everything depended upon the keynote and the harmony. He congratulated the Institute on the holding of meetings such as that, which did so much to promote a unity of arts. He had already stated that great advances had been made in decorative work. At no period had they more earnest students of the true and of the beautiful; at no period had they more skilful hands or more devoted workers. This was a happy augury for the future and for the glorious record of work done. Let no man say that a brighter era was not dawning for English art.

Mr. W. B. Richmond, A.R.A., next read a paper on the same subject He said that fresco, as understood by what the Italians named *buon-fresco*, was quite impracticable in London under the present conditions of the climate—not so much on account of the damp of the atmosphere, but because of the poisonous air which without restraint had been permitted to increase year after year. Fresco painting had been tried by able hands in London, but had failed. Neither could it be safely adopted in any of the manufacturing towns in England, where the atmospheric conditions were even worse than in the metropolis. On the other hand, there was no reason why in country churches, town-halls, and private houses of large towns the fresco painter might not work with all human certainty regarding the durability of his labours. But on certain conditions only would that really be possible. There were two great enemies—damp arising from the foundations of buildings, and damp penetrating the walls from without. He dismissed from consideration the evils which must sooner or later arise to a picture executed in *buon-fresco* from gas and other deteriorating poisons, and for the moment would imagine that they were to discuss the possibility of the adoption of fresco under such circumstances as those with which the Italian painters were favoured. In Italy the buildings and the walls upon which the fresco painter had worked had been well built of good stone, and the frescoes had survived to the present day, excepting where they had been destroyed by the Philistines of the fifteenth and sixteenth centuries, and where time had destroyed them. Let them examine how that durability had been obtained, and consider the reasons of failure in the case of the wall paintings, for example, in the Campo Santa at Pisa. All writers on the art were agreed upon two points—in the first place that walls must be really dry before the *intonaco* was applied, and that no damp must rise from the ground and affect the dryness of the walls either before the painting took place or afterwards, and in the second place that the lime used must be old slaked lime. Upon other points writers differed, yet even here they found a general consensus of opinion that finely-pounded marble dust should be used for the *intonaco* rather than sand, because in the first place the latter might contain a certain quantity of salt which rendered the lime ever liable to be affected by damp weather. It was on account of the sand which was originally taken from land once covered by the sea that the frescoes in the Campo Santa at Pisa had been destroyed. Secondly, sand was less binding than marble dust. The surface of the *intonaco* was very smooth. The bare wall must be perfectly dry to begin with. The first coat of plaster, mixed with ordinary lime and coarse sand, was then applied and permitted to dry; a second coat of finer materials followed, and the last, the *intonaco*, was never more than one-eighth or one-sixteenth of an inch in thickness, composed of ground lime well slaked, mixed with fine sand or marble dust, but in this last coat it was found important to put a larger proportion of lime to sand or marble dust than on the previous occasions, so that the crystallization and the lime should be rather rapid than slow, and the surface, when dry, might be very hard and firm. It had often been stated very wrongly that fresco was not largely used in the thirteenth and fourteenth centuries, and that *tempera* was much more largely employed. The fact was that all the early wall pictures were fresco underneath. It was of the very life of fresco and of decorative work that it should never be pictorial, and never greatly embarrassed by light and shade; that each tint was precious by the harmony which it had to its fellow, that every outline was clear, and every colour full of light. To attempt in fresco what oil-colour could do much better, was like asking the violin to give the full harmony of an orchestra. The strength of fresco was light; the strength of oil was shade. In England light was what they wanted in decoration,—light and colour. They had enough darkness, enough shade, to satisfy their most gloomy desires. Fresco was better adapted than any other material for that result. But how were they to get fresco painted here? That was a difficult question to answer, for every taste in art was for the moment against that manner of artistic training, which would produce artists who could work in such a manly art. He said "manly," because fresco painting could only be employed by a secure and certain draughtsman, a noble designer, and a pure colourist. The artistic essence must be given by the decorator,—not blurred and smudged, but clearly and resolutely defined. The modern school,—the streaky, the dabby, spotty school of recent fashion,—could be in no mood for the chastening influence and manly precision of design; but, on the other hand, there was evidence of a growing endeavour to paint light, and they might hope that the effects of much modern practice in art would find their place in the past, and what was valuable would survive and flourish under the discipline of design. The prices paid for works of art were often so enormous that any sum relative to them would be impossible to expect from those who built churches or public buildings, for obvious reasons. No fresco or wall paintings were marketable. Such work must be done for the love of art, and for small reward. Decoration in fresco ought to pay sufficiently well, for the method was very swift. A life-size figure could be well painted in a day by an expert hand. Good workmen ought to earn 50*l.* per week, and in a fortnight produce a considerable work in fresco. If we were to have fresco decoration in our country churches,—which was most devoutly to be wished,—it could only come about by painters being content to receive moderate rewards for their services. If the art in England was ever to become of national importance,—which it was not at this moment,—if it was to rise above commercial speculation of the sale-room, it could only be by the adoption of monumental painting, and the alliance of the arts,—architecture, sculpture, and painting. To sever them was to weaken the effect of each. In conclusion, he offered a few remarks on the advisability of Architecture and Painting joining hands in England as they once did in Italy. He suggested that the architects should take the matter in hand and inaugurate a school of fresco painters,—appoint a master, get a few pupils, and for two years make the experiment. He believed success would be rapid and sure. There was no particular paraphernalia required for such a school. A big room with four bare walls, and six pupils, would be enough to start with. Under the supervision of a master, and from his design, they could decorate the room in fresco. He believed that at the end of two years' training they might turn out the nucleus of a school of fresco painting such as had been hitherto absolutely unknown in England, and composed of young men who could be employed by architects as decorators, either in the capacity of original designers, or as capable workmen who would be fully competent to carry out designs in a workmanlike manner. He asked them to remember that the modern cry and craze for originality was a very monstrous cry, and a very idle and mischievous desire. The straining after originality was one of the curses of their modern system of life, change and rapid discontent of whatever they were used to being one of the signs of weakness. The really original designers in the whole field of art might be counted on one's ten fingers, but the company of good workmen was innumerable. This was a principle to instil into the young modern man,—the dignity of good work, and his possibility of splendid success, even if his claims as a great original thinker and designer were not sufficient for him to take rank amongst the very chosen and the very rare few. The cost of such an undertaking as he suggested surely need not be great. One guinea a head subscription all round from the more cultivated architects, sculptors, and painters of England would make an ample fund, and he believed that if wisely gone about, there would be no nay to a demand for such a subscription from any member of the artistic community in England who could claim a real love for the promotion of noble art. The decorative artist was at present held in ridicule. Why, he did not know. He believed that if some such scheme as he had indicated were carried out, they who cared for design, composition, form, and colour would very soon find themselves upon a strong vantage ground. Anyhow, a chance would have been given to young men to do serious work for moderate pay, to train themselves in the higher moods of art, and for the love of it to endeavour to give to all country folk, in church, town-hall, or even private house the generous delight they had had, not perhaps in the conception, but, anyhow, in the perfect execution of a work of art.

Mr. N. H. J. Westlake's paper on this subject was read in his absence, through illness, by Mr. John Belcher. The author explained that his object was to give certain opinions, the result of his own study and practice, on the old and new methods of monumental painting. The simplest method was, generally speaking, the most easy of use and the most durable. In England, especially London, many of the ancient practices were useless, and their study was often of more value as a warning than as an example. Beginning with the historic medium mosaic, particularly glass mosaic, its principal virtues were its splendid effect from the diverse angles at which the ends of the tesseræ were cut and set; its depth and strength of colour; a greath breadth and simplicity, arising from its constructural character; and its non-absorption of surface moisture. Considering its defects, it was a secondary art, —and those who had designed mosaics knew how far the result often was from their design; it required a stronger and drier wall for its attachment than some other methods, because if the wall were not very strong the mere weight of the tesseræ would cause them to fall, as had been the case in St. Mark's, Venice; the expense of a really first-class reproduction of a good design was enormous; and it was unfit for work near the eye, or near painted glass, or for altar paintings generally. Under fitting conditions fresco or painting on fresh-plastered walls was the cheapest, most durable, and most beautiful method of mural decoration. The first condition was a dry wall with sufficient ventilation over its surface to prevent the collection of moisture. Simplicity of colouring was also necessary. Painting with simple earths and such colours as a caustic alkali would not destroy, would give a work sufficiently durable for any reasonable test, the execution being rapid and simple. It was better to use large brushes and to work quickly; not to go over the same surface, if a broad flat colour, twice if it could be avoided, and over other surfaces as few times as possible; to cease work directly the wall commenced to dry; and, if not satisfied the next

day, to cut it out and re-plaster. Wetting a wall when cooling was dangerous, and fresco on solid walls was not to be recommended. *Fresco secco* was a compromise between fresco and tempera, but it lacked the greatest advantages of both. Tempera, or distemper, was still practised in a multitude of ways, and on a dry or a battened wall was an excellent and beautiful method. The ordinary vehicles were size, gelatine, white of egg with vinegar or gum arabic and sugar; but, whichever was used, it should not be too stoutly mixed. The vehicle should be only strong enough to hold the pigment so that it would not rub off when dry. Encaustic was perhaps the most durable of all methods of mural painting. Real encaustic was painting with wax and bituminous media on a porous wall, which painting was afterwards melted into the plaster by heat until there was little or nothing on the surface. No bitumen should be used near the lights, as it indelibly stained every other colour; and no composition of tar, pitch, or bitumen should be used on a wall, for the purpose of making it damp-proof, on which a painting was to be closely fixed, as its staining power would ultimately assert itself through the work. Some years since the author carefully examined the old paintings called frescoes in St. Clement at Rome, and found they were really encaustic work. The severe trials they had undergone were proofs of its durability. In conclusion Mr. Westlake advised that in all cases, if there were no false interior wall erected for painting, the existing solid wall should always be lined with thin slate fastened with zinc clouts to the wall, from which the slate slabs should be divided by battens or uprights also of slate or tile. Carved surfaces might be covered with papier maché, which could be bent but would not warp. Panels or altar paintings also were better covered with canvas.

The Chairman said Mr. Ford Madox Brown had also kindly promised to read a paper, but owing to indisposition he was unable to be present. He had, however, sent a letter which the Secretary would read.

Mr. Madox Brown, in his letter, explained the method of work and vehicles employed in his Manchester Town Hall mural paintings. The Gambier Parry process, he said, was described very succinctly and satisfactorily in a paper supplied by the authorities at Kensington to artists who applied for it. The vehicle and colours were manufactured by Messrs. Robertson & Co., of Long-acre. One of the chief characteristics of Mr. Gambier Parry's invention (as regarded durability and avoidance of shine, as also in its differing from the French and German methods), consisted not only in the porosity and absorbency of the ground or stucco employed, but also in that absorbency being made use of in preparing the wall for painting by twice coating it with "wall-medium,"—the ordinary Gambier Parry medium, diluted with turpentine. This preparation, absorbed into the pores of the stucco, constituted what Mr. Parry called "roots" for the fresco. The prescribed method named sand and lime only for the ground stucco. When he undertook the twelve paintings in Mr. Parry's "spirit" fresco he found the panels already filled in with a stucco formed of sand, marble-dust, and lime. This preparation was, however, trowelled down almost to the appearance of polished marble, and was in no degree absorbent. His first care, then, was to have the surface roughened with "grit-stone." After this he had to get a gas-heater of about a yard square, and that applied to successive portions of the panels. This so increased the absorbency as to cause rather less than a gallon of wall preparation to be soaked in. As he proceeded with his work he found that the plaster of the panels Nos. 6 and 7, next the organ, had badly cracked. This, he supposed, was owing to the great weight of the structural features at these corners. He had, therefore, the opportunity of testing both plans of working—his own and the original Gambier Parry plan—for he had to have these two panels cut out and relaid. These two panels were somewhat rougher to the touch than the others, but to the eye there was no very noticeable difference between them and the others. He had now completed seven of the twelve panels, all on the walls themselves, and the earlier ones had stood for some ten years, the only alteration in them being a certain lightening or paling of the colours, owing to the absorption which went on with all paintings on walls, whether they were in *buon fresco* or Italian fresco, distemper or oil. The distinguished art critic, M. Ernest Chesneau, once remarked to him while being wheeled round the big hall in his chair, "I see your system is to bear out the architecture by keeping your decorations light. These are not holes in the walls. In the Pantheon at Paris nearly all the artists have made their decorations too dark: the result is that the walls were forgotten and nowhere." He felt pleased and proud of this commendation, for with him it was not so much the effect of system as of instinct. He never thought about it till M. Chesneau spoke to him, and he had never yet seen the pictures in the Pantheon. When he was painting the "*Crabtree* watching the transit of Venus" he felt compelled to keep it all light, so much so that some critics complained in newspapers that the effect was "not Rembrandtesque enough." The "Rembrandtesque" effect of dark with chief objects lit up in strong light was the reverse of what suited mural decoration, where the chief objects should stand out in dark upon a lightish background.

Sir Arthur Blomfield, A.R.A., who opened the discussion, said he came there rather to listen and learn than to talk; still the subject discussed was one in which he had always taken great interest, and he might, therefore, say a few words about it. He was sure they must all have listened to Professor Richmond's and to the other papers with very great pleasure, and he hoped with profit. They had been told a great deal that must have been very interesting to everybody, and a great deal that to many like himself must have been very instructive. Professor Richmond, Mr. Westlake, and Mr. Madox Brown spoke to them with authority on the subjects which had been treated,—authority derived from a thorough knowledge of the subject, which could only be acquired by long and careful study and extensive practice. It seemed to him that papers like those and others which had been read in that room from professors in another branch of art were a very encouraging sign of the times, and he thought they might be taken as an indication that a gradual *rapprochement* was now going on between the sister arts of architecture, painting, and sculpture, which had been so long divided by what seemed an impassable barrier. At the same time, he thought this movement was none the worse for being gradual, and none the less certain. It gave them ground for hope that perhaps in the not far distant future the highest efforts of painters would not be confined solely to framed pictures, but would extend to the decoration and embellishment of architecture. But that time had not altogether arrived. They could hardly expect, perhaps, to find painters, architects, and sculptors entirely in accord as to the true principles which ought to govern the decoration of buildings. Some twenty-five years ago, or rather more, a book came out which took the architectural world by storm, chiefly by the beauty and profusion of its illustrations, which everybody studied and admired with enthusiasm. But he was sorry to say the letterpress did not receive the attention at the hands of architectural students which it very well deserved. He referred to Viollet-le-Duc's Dictionary of Architecture, which contained complete treatises on various subjects of interest to architects. It always seemed to him that one of the most valuable and interesting of those articles was that of painting as applied to architecture. It was not a very long one, but it seemed to lay down in a practical way the general laws which should regulate the decoration of buildings, besides saying a good deal about methods; but underlying the whole of what the author said, one great principle he insisted on, was the supremacy of the architect,—the necessity that the architect should be the directing mind, or, at any rate, where that was perhaps not always quite possible, that the minds of the architect and the painter should be completely in accord and harmony, and that painters should know something of the architecture of the building they were to decorate, and have a hearty appreciation of its characteristic features and details. Supposing an eminent painter was called in for the mural decoration of a building with the architecture of which he had not the slightest sympathy, what was likely to be the result? He would, no doubt, produce a picture of great intrinsic value,—one that everybody might admire,—and so far it would be successful, but looked at as a piece of decoration appropriate to the building in which it was placed,—looked at as bringing out the features which the architect would most wish to bring out in order to represent what was in his mind's eye,—it would most certainly be in a great degree a failure. Therefore, he thought they ought always to bear that principle in mind. They would see that that involved two things,—the first was, that the architect should know exactly what he wanted, and that necessitated his devoting more careful attention to this very important class of art than, perhaps, was usually the case; the second point,—and perhaps he ought to say the present company always excepted,—was that painters who aspired to decorate great buildings ought to know a great deal more about buildings than, as far as his experience went, painters of the present day generally did. To attain those results, nothing was better than that there should be more frequent and free intercourse between architects and painters. Such meetings as that constituted a very important step in the right direction, and he was sure they all felt very much indebted to Professor Richmond, and the gentlemen whose absence they all deplored, for giving them so much valuable information and good advice on the subject. He proposed a vote of thanks to those gentlemen.

Professor Aitchison, A.R.A., in seconding the motion, remarked that a great deal that Professor Richmond had said would be likely to have a most important influence on them, inasmuch as a painter of his distinction had shown them that he felt the importance of his work being in harmony with the architecture that he had to decorate. He (the speaker) was merely an architect, and, therefore, he might be allowed to have proclivities towards that part belonging to his own profession, which, perhaps, did not equally impress the artist. The walls of any building were to him very important things. They not only helped to sustain the building, but to keep out the weather, and he did not want to see a wall converted into a panorama, but for it to be made beautiful in colour and shape. This might be rank heresy, for anything he knew; for even in the Stanze at the Vatican, there were many walls in the churches or other buildings of Italy on which the figures act, ride, walk, or exhibit some vigorous action which was not at all, to his notion, the way in which a wall should be decorated. Although the Byzantines were very inferior to the masters of Greece and Rome, and to the great artists of the Renaissance, still they did recognise the fact that the solid parts of a building were to be decorated and not turned into something else, which seemed to him to be beyond all praise. A certain restraint in the figures and simplicity in the ornamentation seemed to him to do better for architectural decoration than the more brilliant and vivid action that they saw in the easel pictures of the old masters. Professor Richmond's remarks about frescoes standing very well in the country particularly struck him. Not sixty miles from London Professor Richmond decorated a drawing-room with frescoes, the subjects being Greek, and, as far as he could judge, they were as good as when they were painted twenty years ago. The way in which the whole scheme of decoration was managed was such that it by no means interfered with the quiet harmony of the room, but gave it a dignity which was rare in England. Frescoes had this particular quality, in common with books, that where a man could not live healthily, fresco and books could not either. That was something to be said in its favour, besides its beautiful simplicity. The marble dust of which Professor Richmond spoke was an ingredient in the old Roman plastering, but he was not quite sure that some of the things said about it were quite true, for the lime at Rome had to be slaked for five years, and walls plastered with it became so hard that they were cut out and used for table tops. Professor Richmond was very good in giving us information as to how a school for fresco might be started. In London, they could not use fresco on account of the atmosphere, but even if they could, it would not be employed in private houses, as they generally belonged to somebody else. He was extremely pleased to hear Professor Richmond's remarks about the modern passion for what was called, originality. Everybody liked originality, and it was to be encouraged, but the fact was that what man had done was like the coral island, the result of the efforts of numerous

insignificant insects; and for one man to suppose that he was going to create something that was better than and different from anything done before appeared to him to be absurd. All they should ask, or could ask, of anybody was to take the best of that which immediately preceded him and endeavour to enrich it by his own originality. The worst of this passion was that many who were not blest with originality were apt to fall into extravagance and distortion.

Professor Kerr said that in his very humble opinion Professor Richmond's doctrine of the supremacy of fresco painting for mural decoration under the direction of architects was one well worthy of their highest consideration. Whether it was possible for the Institute to found a school of decoration such as Mr. Richmond, evidently with great sincerity, had proposed, he should not like to take upon himself to say. He would rather like to understand how it could be done. He thought the Royal Academy might do it; they could afford to do it very much better than the Institute, and they might derive a great deal more credit from it.

Mr. John Hebb said Professor Richmond had given a great deal of information which they did not possess before; but, at the same time, he might be allowed to enter his protest against the assumption that architecture should be properly subordinated to painting. They had heard from Sir Arthur Blomfield a protest that painting should always be subordinated to architecture, but historically that was not true; painting, on the contrary, had always held its own.

Mr. G. T. Robinson said with regard to the unity of arts the less they tried to bind them together with an artificial cord, the more likely it was to be attained. If the architect sat very hard upon the painter, the latter would be very apt to resent it, and they knew perfectly well that the sculptor would not be amenable to any law whatever. He thought, therefore, it would be vain to attempt a unity by any legal arrangement, or to bring them together by any other arrangement except good will. If in any sense architecture and decorative art could be combined, he thought it would be a very good thing for painters, to say nothing of architects. The only way in which they could come to the front was by learning lessons from each other.

Mr. Wm. Woodward said Mr. Brydon had made use of this observation,—"Let no one say English art is not looking up." There was an example in his mind at this moment which led him to entertain an exactly contrary opinion. He referred to the interior of St. Paul's Cathedral. The whole decoration of the finest edifice of its class in the world was simply the cream and gold of a West-end decorator. He thought if Professor Richmond and the other distinguished men who had read papers would devote their energies to stirring up the British public to adequately decorate that magnificent edifice they would be all delighted, and some practical good would arise from the very excellent papers they had heard. Whether that decoration should be in fresco or in mosaic he was sure gentlemen of the artistic ability of Professor Richmond could tell them, and he hoped some outcome of that discussion would be that public attention would be once more called to the decoration of St. Paul's Cathedral.

Mr. Longden said he had long formed the opinion that all fine buildings had originally been intended for painting, and he thought most of them had been painted. If any one saw the effect of the fresco painting such as Professor Richmond had been speaking about in Italy, they could not mistake that a building that could be so decorated was very incomplete without it. They had not had much of that kind of work in England of recent years. Of course there were the remains of the old painting in the churches, which was often grotesque, but which no doubt had considerable decorative value. He was glad to see that there was a movement towards colour in building. It was being now introduced in many ways, and he thought that the beauty of the grey stone was perhaps not quite so dwelt upon as it used to be. One of the artists who had worked most in that direction was the late Mr. Sedding, whose name had been mentioned several times that night. Mr. Sedding was anxious to associate with him in his work artists of all kinds, and one of his great merits was that he encouraged artists of all kinds to display their work, to work in agreement with him, but not in such subordination to him as that they could not develop their own individual originalities. Sculptors, painters, glass painters, and workers of all kinds were encouraged to show their originality always under his guiding hand, and a final result was achieved which he thought would be the same in other cases if the same opportunities were offered.

Mr. Ralph Nevill thought the time had hardly come for the establishment of a school of fresco painting, because he was afraid they could not take it that there was certain knowledge of the way to design both the lines and the colour of the picture. He thought before they went to fresco it would be better to try such a school for *tempera*, because it was a thing much more easily managed and much more perishable, and, therefore, their first efforts, which they could not expect to be over-successful, could be easily obliterated by their successors, and they would not be entailing upon them failures in works of fresco which they would hardly like to do away with. The effect of *tempera* was very good, seeing how easily it was done. He had done some work in it, and had coloured a whole church with his own hand. They had hardly touched upon the principles of decorative colour, and he thought the suggestions had been so practical that at another meeting they should go rather more into that matter because there was a very great deal to be said about the principles of all schools of decorative colour.

Mr. Paul Waterhouse said if his father had been there he would have wished to refer to a point mentioned in Mr. Madox Brown's letter. Alluding to the panels in the Manchester Town Hall, he said two of the prepared panels had cracked, and it was supposed that this was caused by the superincumbent weight of the structure. Those who had been in the Hall would know that there was an arch of a very wide span over the organ loft. This arch, though not causing a settlement, did bring about a certain depression of the wall; and he supposed that the material prepared for painting, not being as elastic as the wall itself, did not yield, and this was the cause of its cracking. This point showed how necessary it was to wait in a large building to see that all settlement of any kind was at rest before a valuable painting was put upon the walls.

Mr. G. H. Fellowes Prynne suggested that the Council should consider the advisability of collecting such works of Mr. Sedding as they could, and have them exhibited in the rooms of the Institute. The same suggestion, he thought, should apply to the works of other deceased members.

The Chairman said the Council would be very happy to consider the suggestion, with the aid of the Art Committee.

Mr. James Brooks said the members had spent a very agreeable and profitable evening. He regretted that Mr. Westlake was not present to go more deeply into his paper, and to give some little account of the work which he, along with himself, had been engaged in for the last twenty years in a church at Chislehurst. He did not know how many pictures had been painted in that church, but they were all subordinate to the architecture, which was not in any way depreciated, but rather increased in value by the admirable pictures of Mr. Westlake. He expressed the hope that this would not be the last of such evenings, and that there would be in the future amity amongst sculptors, painters, and architects.

The Chairman expressed his high appreciation of the very able papers which had been read. When all were so good it was invidious to refer to one in particular, but he could not help expressing his appreciation of the very remarkable paper to which they had the pleasure of listening from Professor Richmond. He wished also to congratulate the Art Standing Committee upon the success of the evening which they had prepared for them.

The resolution according a hearty vote of thanks to the authors of the various papers was passed by acclamation, and Professor Richmond briefly replied. The proceedings then terminated.

The Architectural Association.—The first visit of the Sketching and Measuring Class will take place on Saturday, the 25th, at 3 p.m., to the Church of St. Mary Overie, Southwark. The annual dinner of the Association is fixed for Thursday, May 28.

The Surveyors' Institution.—The annual dinner of this Institution will take place on Monday, May 25, at the Holborn Restaurant.

ANCIENT IONIAN TEMPLE DISCOVERED AT LOCRI.

The excavations executed by the Italian Government near Gerace, Calabria, in the area where the ancient city of Locri was situated, are terminated. The excavations restored to light the foundations of the entire west front of a temple, with steps, and with the extremities of the long sides which join the front (see A, B, C, D in fig. 1).

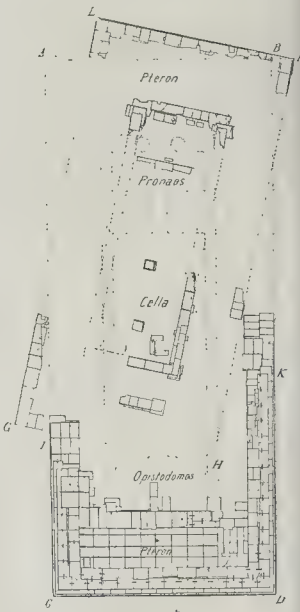


Fig 1

The central area of the temple was explored, but no trace of the cella was found, except a little portion of the opisthodomos; but the excavators discovered traces of a more ancient temple (see fig. 1, E, F, G, H). The more recent temple was constructed with masses of Tufa stone, probably taken from quarries not far distant on the Apennines, of which, however, almost every trace is now lost. The blocks of this material were brought roughly cut on the site, and there received the finishing touches, as could be ascertained by the quantity of scraps and pieces of Tufa stone and remains of work scattered all around the temple. Some

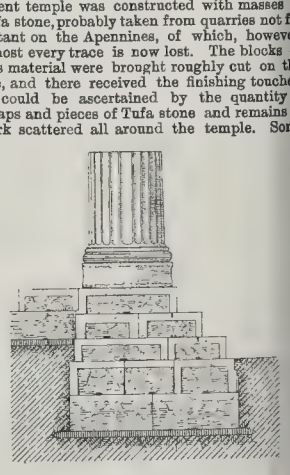


Fig 2

blocks measure as much as 2·08 by 2·07 by ·32 mètres, and one also 2·95 by 1·125 by ·5(mètres. These blocks were cramped by solid bars of iron of H-sections embedded in them. These bars were found only in those parts of the temple, which most needed strengthening, especially at the angles. The stylobate (see fig 1, I, C. D. K.), destined to form the base

ment of the peristyle, is a ponderous construction of five courses, decreasing in size from the top to the base. The two last courses form really the foundation, and are in width 2·40 and 2·50 mètres. The three upper ones forming the steps, are in height ·325, ·35, and ·39 mètres. The pavement of the peristyle is preserved to the extent of 14·36 mètres in length, and 3·32 in width; it is formed of rectangular slabs of Tufa stone. The short side of the temple is 19·04 mètres wide; the long sides (although not preserved, because the temple was totally destroyed for the use of the materials) could, however, be measured, taking into account the trenches made for the extraction of the stone, and were ascertained to be about 35·59 mètres long. The temple was hexastyle-peripteral, with six columns on the short sides, and seventeen on the long sides. Of the columns, only the lower drum with the base of one (see fig. 2) was found, a longitudinal section of one of the central drums, and some fragments of the capital (see fig. 3, 4). These fragments have been sufficient to calculate the total height of the column as 11·13 mètres. The fragment (fig. 3) belonging



Fig. 3

to the capital preserves two volutes with the *oculus* decorated with a flower of six petals. Nothing has been discovered of the entablature or of the decorations of the temple.



Fig. 4

In the excavations of the west front there was found a decorative group in fragments and other pieces fallen from the pediment. The principal group is in Parian marble, the subject is not, however, clear, and the interpretation is at present difficult (see fig. 5). The group is of the height of 1·17 mètres.



Fig. 5

Of the cella of the temple nothing remains, except some vestiges of the opisthodomos and the foundations of the west antæ. In the centre, however, of the cella, were discovered three larger stones, connected with bars of Z form, and as these stones stand exactly in the centre of the cella, it is probable that they sustained the basement of the altar situated before the statue of the divinity.

The archaic temple occupied about the same area as the later one. Its construction and the nature of the stone appear completely different to that of the other temple. Its different position and the few painted terra-cottas found amongst the ruins, and the great diversity of construction, suggest that it was a building of about two centuries earlier than the other.

There is nothing to suggest to whom it was dedicated. Livy speaks of a temple at Locri sacred to Proserpine, but he says that it was outside the city; this one is inside the walls.*

B.

THE USE OF CLOISONNÉ FOR DECORATION IN ANCIENT AND MODERN TIMES.†

Byzantine.

The subject of Byzantine art has just been taken up by Mr. Aitchison, who has pointed out the enthusiasm with which the buildings were erected, and the luxury and riches, in the form of gold and silver and precious stuffs, which were lavished upon them. Procopius says that 40,000 lbs. weight of silver was employed in the sanctuary of St. Sophia, and the Ambo, of rare marbles, was enriched with precious stones and ornaments in enamelled gold; and the dome roof was of gold enriched with gems. If to all the luxury of material we add the Asiatic love of colour and the employment of Greek workmen and traditions, we shall not be surprised to learn that *cloisonnage* again found a fertile soil. Sculpture being disallowed, *cloisonnage* and mosaic came to the front; and it is here, first of all, we find an extensive use made of *cloisonné* enamel. The paliotto of St. Sophia is said to have been decorated in this work; and a little piece, stated to have been a part of this, is in Jermyn-street Museum. Though the bulk of all this work has disappeared, a fine example remains—the Pala d'Oro at St. Mark's, Venice, which was ordered originally for Doge Pietro Orseolo, at Constantinople, in 976, though it was subsequently enlarged and altered. There are other works in *cloisonné* enamel, which have been probably brought from St. Sophia with it. Its value is said to be 160,000*l*. It is now in three divisions, one above another. The lower one, with Christ and the Virgin Mary in the centre compartment; on either side the Doge Ordelafo Faliero, and the Empress Irene, and the prophets on the outside of these. In this second division is Christ blessing, with apostles on either side. In the third a figure of an angel, flanked on either side by scenes from the life of Christ. In all there are eighty-three panels of *cloisonné* enamel in gold. M. de Verneileh says, that when in use, the effect of it is of the greatest beauty, the light reflected from the thin and numerous *cloisons*, &c., eclipsing the mosaics. "With its innumerable figures drawn in lines of fire, and tinted with glowing colours, it is a striking example of the *rôle* which enamels can play in the decoration of religious monuments."

Cloisonné jewellery for personal use also seems to have been made, the *cloisons* always being very thin, and the enamel very clear and bright. *Champlevé* does not seem to have been used at all.

As in the case of the Egyptians, the use of *cloisonné* in their most precious monumental works set the taste for other things, and we find the silks and textiles made under Byzantine influence echoing this work. The use of gold, and colour, and lines dividing colours, is often the basis of design.

The MS. illustrations are manifestly inspired by the enamel work, as in the MS. in the Imperial Library at St. Petersburg. The mosaic in the principal nave of St. Galla Placida, Ravenna, is quite a *champlevé* in effect; and the mosaics at Palermo show a general linyness of treatment. The works of Torriti, in the Basilica of St. Jean de Lateran, show a similar use of white dividing lines, and suggested to Mr. Gerspach a Persian faïence.

The Byzantine carving is nearly all worked on the edge principle, notably the ivory work. The use made of *cloisonné* by the Byzantines suggests especially panel decoration for the introduction of colour in frontals, pulpits, and the like. Sketches of works executed for St. Mary's, Chester; St. Luke's, Cork; the Harrow Mission Church, Latimer-road, &c., show how this can be done.

Russia (Greek Church).

The Byzantine traditions seem to have continued down to our own time, in the Greek Church of Russia, though modified by Asiatic and Renaissance influences.

Metal work and enamel hold the principal place in Russian art, though, unfortunately, little remains anterior to the seventeenth century. But from this date a rich collection exists, and the use of *cloisonné* and enamelled filigree is abundant, and is the principal characteristic of the work. It is, however, used without reserve, and though the effect is rich and gorgeous, it is not very satisfying after the finer works of other times.

It was applied to most varied uses, decorating images or pictures, lockets, crosses, vases, book-covers, lamps, chrisms, and other church furniture. The imperial crowns, the imperial orb, shoulder plates, and other ornaments of the royal robes, the sceptre and the thrones, are all wholly or in part *cloisonnage*. Damascene work is also prevalent in armour. Shields, scabbards, bow-cases, and armour are also treated with gold and enamel.

The collection of Russian enamels at the British Museum gives an idea of the effect of this work.

Moresque.

We must remember also that Saracenic art was largely based on Byzantine art, and here, whatever else varies, the use of a gold line to divide colour is constant. The decorations of the Alhambra, for instance, are all based on this, and it is because of this that such infinite complexity and richness have been attained, without losing a sense of chasteness and repose.

Mediæval.

The history of the Rhenish Byzantine and Mediæval schools of enamelling is comparatively well known, and I will only insist on the fact that until a decadence of taste set in enamel was used in the form of *cloisonné* or *champlevé*.

Byzantine enamel is associated principally with filigree, the Rhenish with chased work, as in the reliquaries of Cologne and Aix la Chapelle. The contrast of the delicately-wrought metal and the rich colour is extremely beautiful. French work is, artistically, much coarser, and more reliance is placed on enamel as an end in itself.

Goldsmiths' work and enamellirg appears to have been, about the twelfth century, the art most in repute, and was most extensively used for princely presents, for monumental purposes, and for the adornment of all sorts of sacred objects, and its influence must have been great in setting the taste in other arts. I cannot but think that the cultivation of this art gave origin to much that is not generally connected with it. There seems no doubt that painted glass grew out of it. Painted glass appears first in the vicinity of Limoges, about 1100, and the earliest glass known to exist, that of Le Mans, bears internal evidence of its origin. The drapery of the figures is drawn in a way foreign to painted work, but such as would be the natural outcome of cutting spaces out of copperplate for enamelling, and the borders of early windows, and the ornament generally, is just of the character found in *champlevé* enamel. In a few years all trace of this enamel-like drawing disappears.

So, again, much early Gothic carved ornament in stone points to an adaptation of the gold filigree work used with enamel, as in the reliquary at Aix-la-Chapelle.

Again, it is evident that memorial brasses are derived from *champlevé* enamelling, as, though they generally are rather in intaglio, many examples exist of parts, as of armorial bearings, &c., with the whole ground cut away and filled in with colour, so as to produce a real *champlevé*.

While the brasses are well known, the stone slabs, which were also largely used, are less remembered. They are *champlevé* work in stone, and in some cases metal *cloisonné* is associated with this, as, for example, in the

* The illustrations are reproduced from the *Notizie degli Scavi*, an official publication of the Italian Department of Public Instruction.

† Conclusion of a paper by Mr. Clement Heaton, read before the Society of Arts, March 24. (Concluded from p. 311.)

memorial slab of Frédégonde, formerly in the church of St. Germain-des-Près at Paris, and another of the Bishop Frumauld. The main lines of the design are marked by stone *cloisons* of some width, and subordinate divisions are made in brass, and the colour obtained by a coloured *béton*. Later examples, as that from the church of St. Genevieve, Paris, and another in the Cathedral of St. Omer, are *champ-levés* in stone, filled in with black and coloured mastics. These evidence the appreciation of this kind of inlay by Gothic artists, and offer suggestion for memorials to-day.

For memorials, the use of bronze is evidently of great advantage, as it is unbreakable and imperishable, and being of a different material from the building where it is used, greater liberty of treatment is allowed than would be the case with stone or marble. But it is of itself apt to look heavy and dark, and this defect the use of colour by means of *cloisonnage* removes.

The colour is added without any loss of preciousness, and this practice can be extended to statuary and relief work.

There is a good deal of pavement work at St. Omer, of marble inlaid with coloured mastic, and this work, it has been supposed, gave rise to the "Norman tile" work, or encaustic tiles in clay, so much used in England, which are, in fact, a *champlevé* in earthenware.

While in the fourteenth and fifteenth centuries *cloisonnage* is lost sight of in the Gothic work, the association of gold lines is found extensively in Gothic MS. illustrations.

I have no need to insist further than was done the other evening by Mr. Starkie Gardner, on the art having been practised in England, but it is interesting to accentuate the fact that, here in London, *cloisonné* was being made in Saxon times, and that some of the pieces are at the British Museum to-day.

As to Irish work, not only was *cloisonné* enamel used, but this, with the filigree, seems the basis of the interlacing spiral ornament in the MS. drawings and elsewhere in Celtic work, which has sometimes puzzled archæologists to account for.

Renaissance.

I have, finally, to say a few words of the Renaissance period.

In Renaissance work—founded upon the Roman Classic—we find no tendency to a *cloison*-like treatment. Everything tends to relief. And, even in the polychromatic ornament, as at Mantua, &c., relief work is the "*motif*," and colour has to fit in as it can, and, consequently, is rather a "fifth wheel," as the French say.

But in French Renaissance we find another type of design; and here the *cloisonnage* system is pervading. This is easily explained. Much of the French Renaissance came through Venice, and Venice was exposed to Oriental influence. Many of the Venetian book-covers are scarcely distinguishable from Persian examples. We know how the Venetian book-binding was brought into France after the Italian wars, by Grolier, and, through him, taken up by the Court; and this, in itself, may have done much to introduce the interlacing patterns so much in vogue in the time of Henry II.

It is because early French Renaissance is pervaded with an Eastern spirit, that the principles of *cloisonnage* are so marked.

In early French Renaissance, book covers, enamelled jewellery, textiles, painted decoration, and especially *appliqué* embroidery, all show this Eastern influence. Enamelled jewellery was abundantly produced, until it commenced to decline, when Louis XIV. sent his plate to be melted up in 1688. A peculiar kind of *cloisonné* was made in France for watch covers. It seems to be a continuation of the Pertubghur method. Several examples are at the British Museum; and designs for this work, by Philip Nolin, are extant.

We find the same feeling in England under Elizabeth and James I., but, of course, in a coarser and heavier expression. In Germany enamelled filigree was much used.

As the impetus of the Renaissance died away, the system of *cloisonnage* completely disappeared; but now that there is such a strong tendency towards Early Renaissance, this, as a part of it, should be brought forward again. And it is especially adapted for fire-place decoration.

We have now reviewed the work of long centuries, and the arts of many nations and climes, though the list is far from complete, and we have seen *cloisonnage* pursue its way from the dawn of civilization in Egypt to the present day.

It has always been regarded as something precious, and it has been associated with sacred and royal use, and especially for monumental art. The Pharaohs of Egypt; the warrior kings of Mycenæ; the Sargonidæ of Assyria; Darius and Xerxes; the noble ladies of Greece; the Byzantine and Hungarian emperors; our English kings, Saxon and Norman; Charlemagne; the line of Russian Czars; Henry II., and Queen Elizabeth are among those who have all, one way or another, used this art; and who shall number the potentates of the great and mysterious East who have glorified themselves therewith? In architecture, the temples of Egypt, the palaces of Assyria, the temples of Solomon, of Ephesus, of Athens, of Olympia, of Pæstum and Metaponte, and numbers besides, have felt its influence; and, in later days, the sanctuaries of Byzantium, Venice, Aix-la-Chapelle, Paris, and Westminster, and numberless others have been enriched by it.

Can it be considered then a barbaric and trivial art? If so, then is all decoration barbaric, for *cloisonnage* has flourished at the epochs and among the people whose arts we copy and admire—when the decorative design was at its highest; and it has fallen out of use when beauty of line and beauty of colour were no longer appreciated for their own sake, and artists were forced to lean on some form of imitation or fantastic design.

But we live in a time when walls are not covered with gold or bronze, but with advertisements; when enamel—stored up as a precious substance in Sargon's treasury—is turned out in unlimited quantity, and dedicated to the rival glories of soap and mustard. The ideal of life is cheapness and not preciousness, and bigness rather than beauty; but, above all things, *cloisonnage* has ever been valued for its preciousness and its beauty, and its use will therefore be limited to special occasions.

Battersea Polytechnic Competition. The architects of the design published in our last should have been given as "Messrs. Roger Smith, Son, & Gale," instead of "Roger Smith & Gale."



Link-holder, Siena.—From a Sketch by Mr. H. Percy Adams.

Illustrations.

ANCIENT AND MODERN METAL-WORK FROM SIENA.

Of these examples of metal-work no artist will doubt for a moment which to prefer. In the thirteenth century tripod there is a force of treatment in the legs, and the conventional heads or suggestions of heads holding the rings at the top, which beats all the others out of the field, simple and naïve as it is in comparison with them. The two very elaborate late Renaissance examples from Monte San Savino are remarkable *tours de force* in wrought-iron work, but are entirely wanting in artistic reserve; they are however interesting as examples of Renaissance metal-work of a certain class.

The two modern works, fairly good of their kind, are interesting for comparison with the two classes of ancient work represented, as showing the essential difference in spirit and handling between old and new.

The ancient link-holder from Siena, of which we append an illustration from a sketch by Mr. H. Percy Adams, illustrates the force and vigour of early Renaissance work of this kind, as contrasted with the later examples in the plate.

BARRY DOCK CHURCH.

The rapidly-increasing population at Barry urgently calls for church accommodation to take the place of the small temporary iron church which was erected a short time ago, and which is now quite inadequate for the requirements of the neighbourhood, for it only holds about 300 worshippers. Recognising this fact, "a gentleman holding important local interests" has generously placed 500*l.* in the hands of the Lord Bishop of the Diocese towards the erection of the new Church of St. Paul, the design for which, by Messrs. Kempson & Fowler, of Llandaff, has been adopted, and is illustrated by us this week.

The church is so urgently needed that it has been determined to erect it by sections as funds are collected. For this purpose it is still necessary to raise from 2,000*l.* to 3,000*l.*, in order





The Red Hall. Leeds.

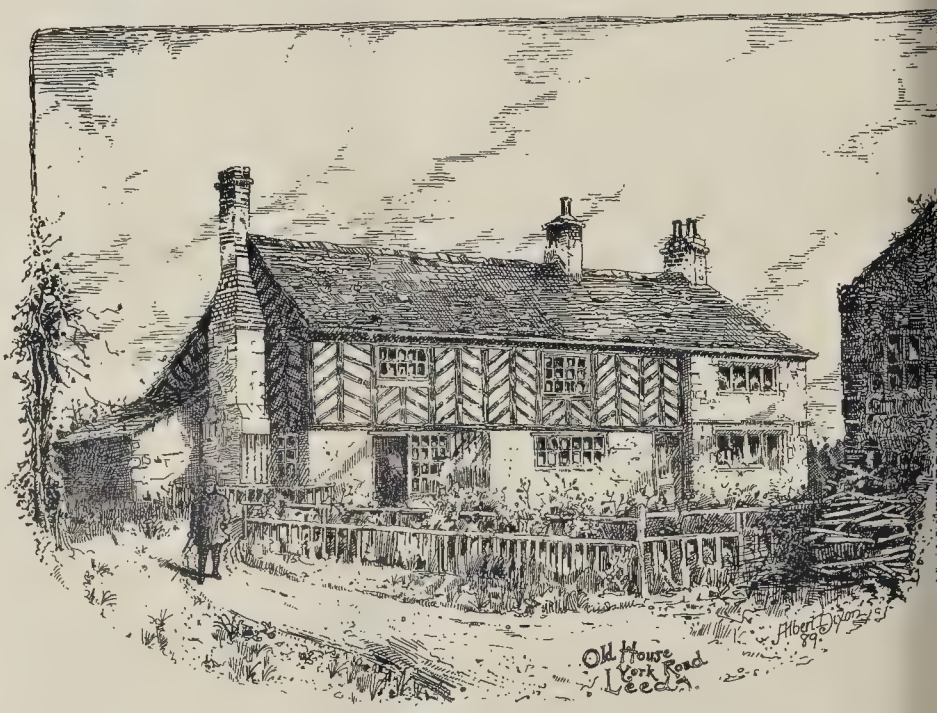






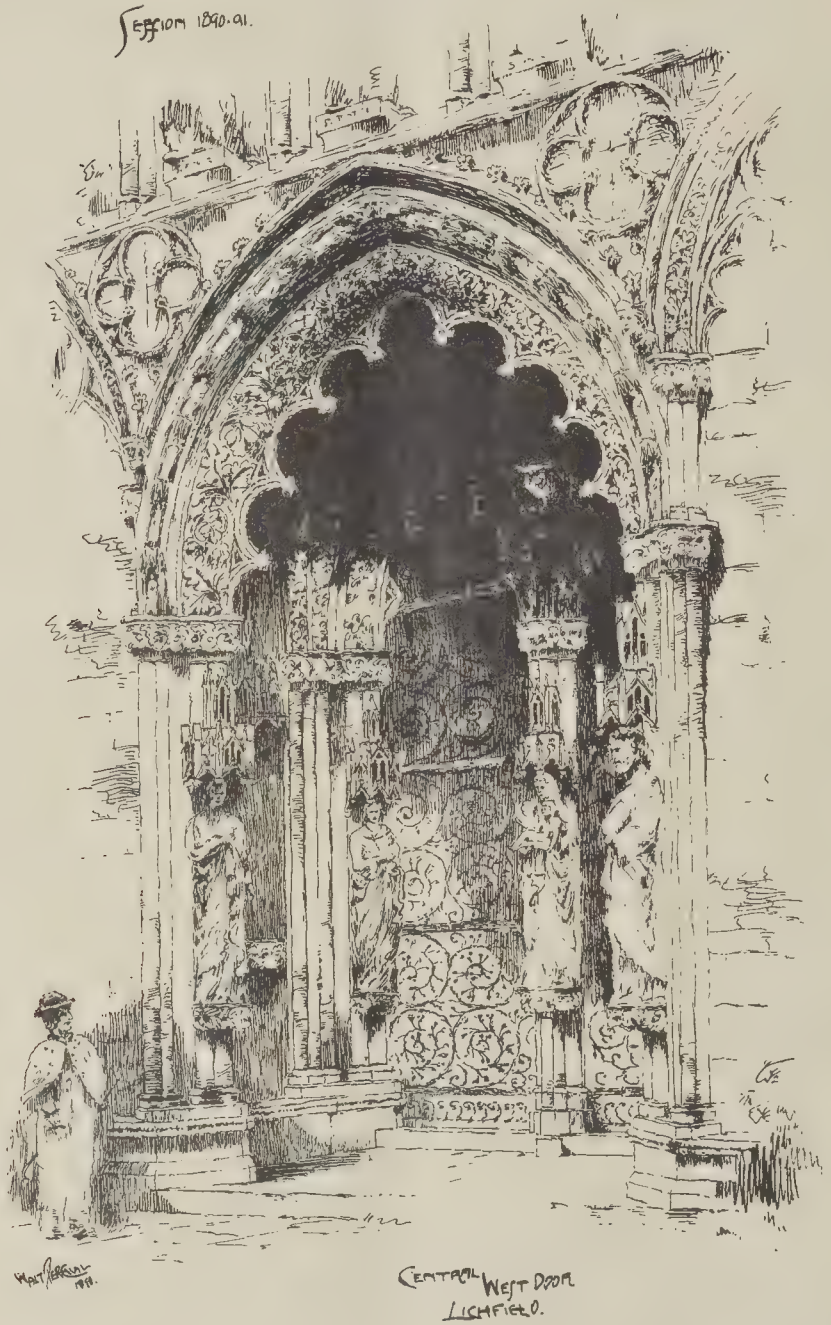
PHOTO-L THO SPRAGUE & CO 22 MARTINS LANE CANNON ST LONDON E C

RAWN BY MR. ALBERT DIXON

Pugin Travelling Studentship

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SESSION 1890-91.

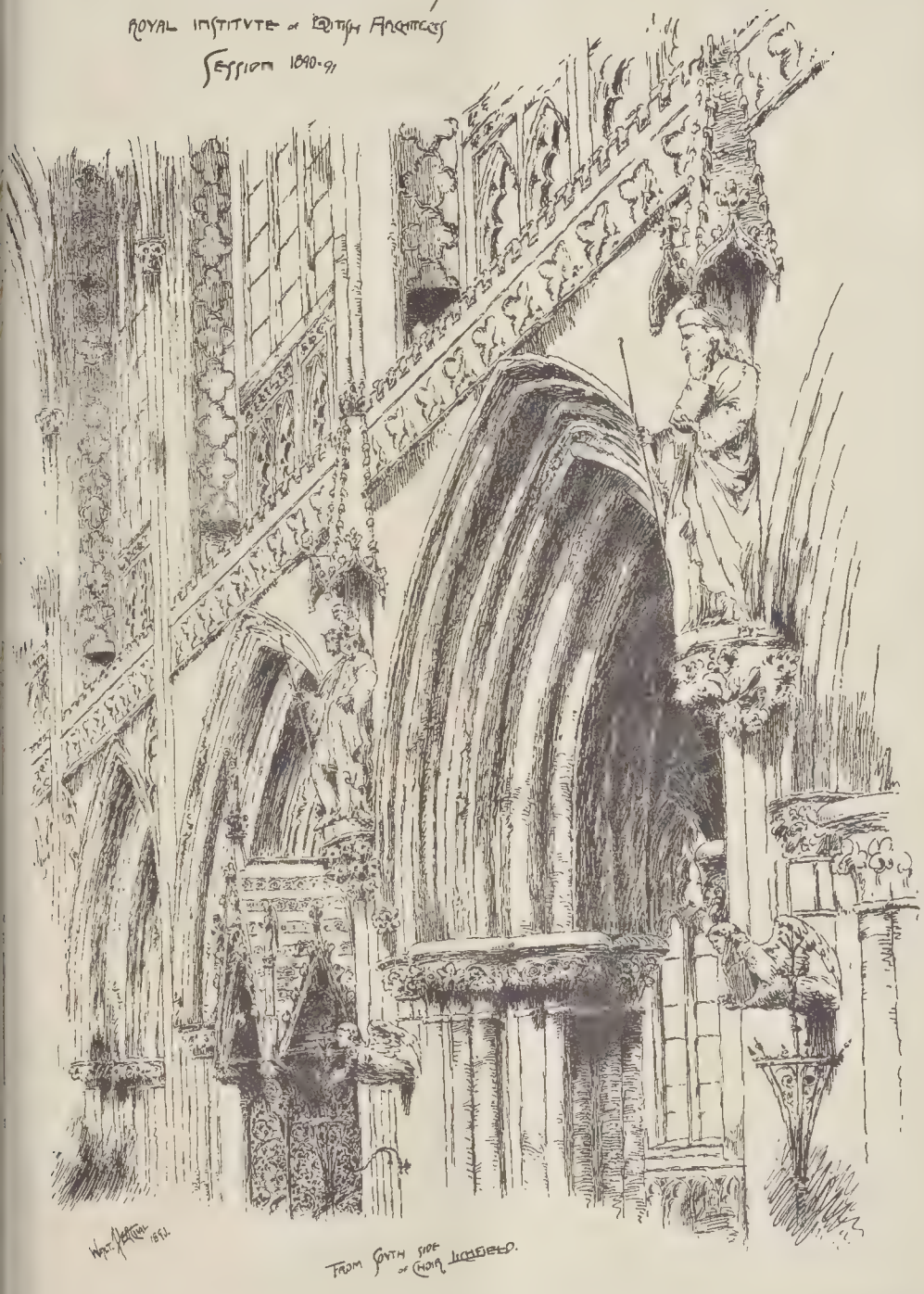


CENTRAL WEST DOOR, LICHFIELD.—From a Sketch by Mr. W. Percival.

PUGIN TRAVELLING STUDENTSHIP

ROYAL INSTITUTE OF BRITISH ARCHITECTS

SESSION 1890-91

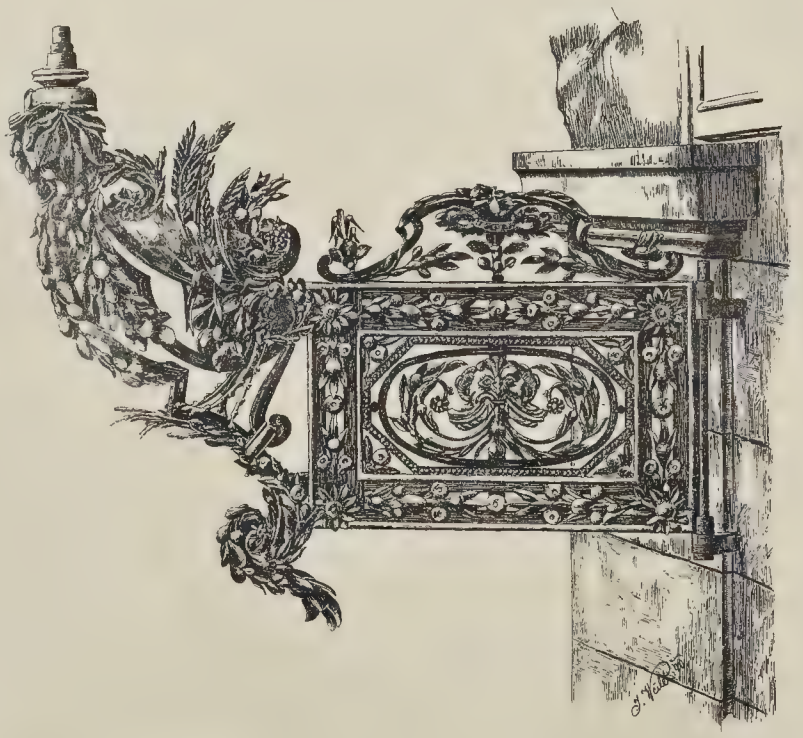


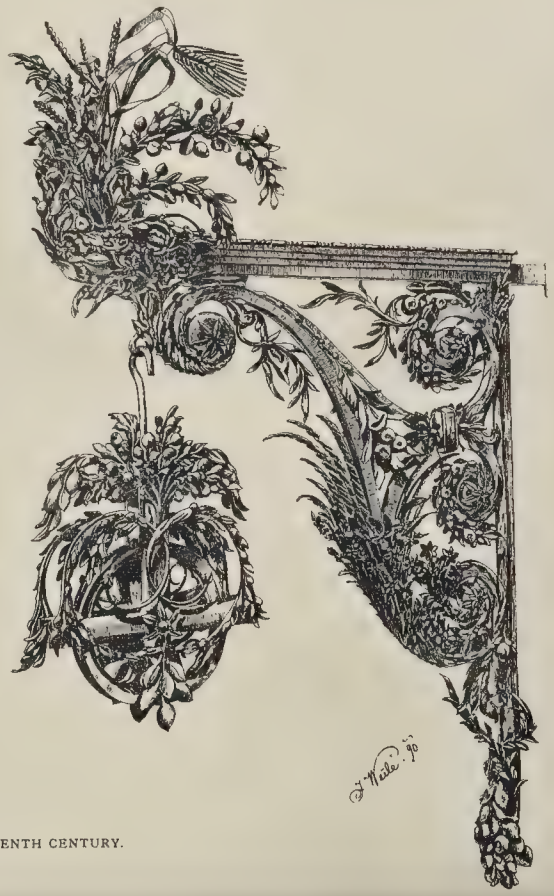
IN THE CHOIR, LICHFIELD.—FROM A SKETCH BY MR. W. PERCIVAL.



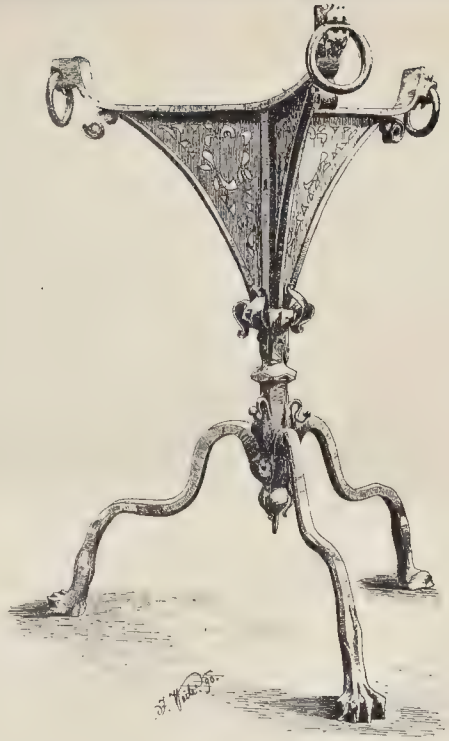
AN ADDITION TO AN OLD HOUSE.—Mr. C. E. Mallows, Architect.

yal Academy Exhibition, 1890.

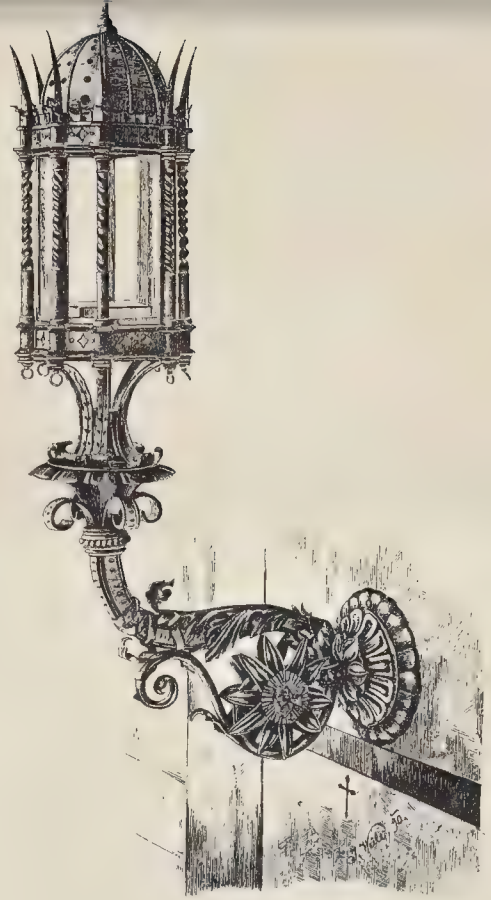




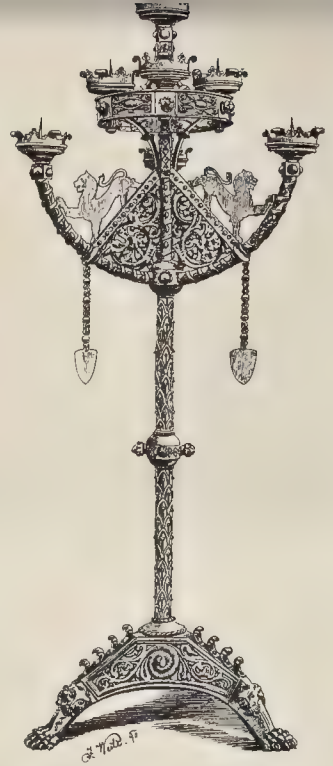
AT THE FILLIPPI PALACE, MONTE SAN SAVINO, (NEAR AREZZO): SIXTEENTH CENTURY.



TRIPOD FOR A CHAFING DISH, STA CATERINA, SIENA: THIRTEENTH CENTURY



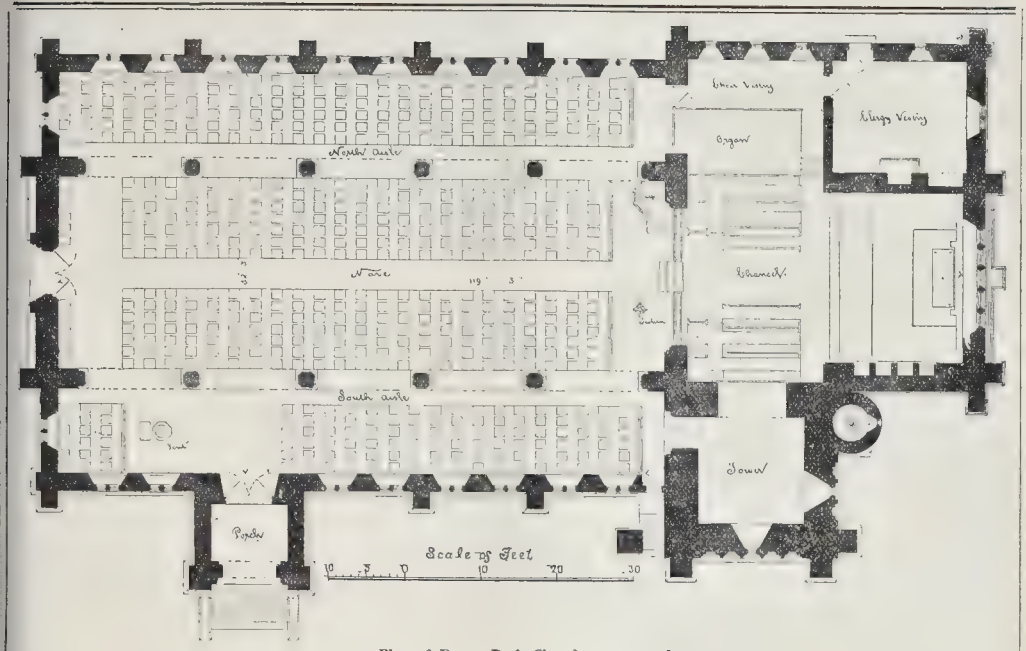
WROUGHT IRON LANTERN IN CHURCHYARD OF THE MISERICORDIA, SIENA
BY FRANCI OF SIENA.



WROUGHT IRON CANDELABRUM BY ZALAFFI, SIENA.

PHOTO-LITHO. BERLIOUX & CO. 2 MARSHALL AND SNELGROVE'S, CAVENDISH ST. LONDON W.

OLD AND NEW ITALIAN IRON WORK.



Plan of Barry Dock Church, as proposed.

that the first section, viz., the nave, chancel, and one aisle, may be commenced, the need for a church having arisen suddenly in consequence of the increase of the neighbourhood. In fact, about six years ago Barry was a barren beach, with a farm-house and two or three scattered cottages in the neighbourhood, but is now in process of becoming an important seaport town.

St. Paul's church, when complete, will accommodate between 700 and 800 people.

AN ADDITION TO AN OLD HOUSE.

This drawing, which was exhibited in the Royal Academy of last year, represents only an imaginary picturesque corner supposed to be produced in making additions to an old house; it is therefore to be regarded merely as a drawing, not as a work of practical architecture. Mr. C. E. Mallows is the author.

SKETCHES AT LICHFIELD CATHEDRAL.

These are from a set of sketches in pen and ink submitted by the author, Mr. W. Percival, in competition for the Pugin Studentship at the Institute. They exhibit a rather novel method of using pen and ink in drawing of this kind, painting with it in rough lines so as to produce a broad effect rather than a minute treatment of detail. Without saying that we entirely approve of Mr. Percival's method, it has sufficient originality and force of effect to merit attention as one manner of using the pen in the illustration of architecture.

OLD HOUSES IN LEEDS AND NEIGHBOURHOOD.

Of the few old houses which still exist in Leeds, standing out in strange contrast to their modern commercial surroundings, none, perhaps, are more interesting in appearance and history than the Red Hall, built of brick in A.D. 1628 by Alderman Metcalf. An apartment in this hall is called the "King's Chamber" ever since Charles I. lodged therein,—probably while in the hands of the Scots, on his way from Newark to Newcastle.

Killingbeck Cottage, described upon the sketch as an old house up York-road, is about three miles from Leeds. It is built in timber and plaster, upon stone, with brick chimneys. It is used as a farmhouse, and takes its name from the ancient family of Killingbeck, who resided in this district.

Lumb Hall is a good specimen of the numerous ancient dwellings of its class scattered about in Yorkshire. It is a stone building, and is interesting on account of its close proximity to Adwalton Moor, where a battle was fought in 1643 between the Earl of Newcastle and Sir Thomas Fairfax, who had attempted to relieve Bradford, then besieged by the former. The attempt, however, was futile, and ended in the total defeat of his forces.

Ardsley Hall was once the seat of the Copleys, and possessed the usual appendages which belonged to a family of consequence. It is built entirely of stone, and is now the residence of a working man.

Albert E. Dixon.

AN OLD WRITER ON OLD TIMES.

Probably few except literary or historical students look through the pages of Thomas Fuller now. His book entitled "The History of Britain from the birth of Jesus Christ until the year MDCXLVIII., endeavowred by Thomas Fuller," contains, however, in his own quaint language many passages which are of considerable interest as throwing light on matters connected with Church furniture and the changes that were going on during his lifetime in regard to the manner of doing things, and which are amusing and characteristic also from the mixture of personal feeling which is constantly intruded into his remarks. Some quotations may be of interest to our archæological readers. The following is from the parish register of "Waltham Abbey" Church:—

"1554. *Mariæ primo.*

Imprimis: For a cross, with a foot copper and gilt, twentie five shillings.

Item: For a Cross staff, copper and gilt, nine shillings and fourpence.

Item: For a pax, copper and gilt, five shillings (greet one another, saith St. Paul, with an holy kiss, on which words of the Apostle, the Pax had its original). This ceremony performed in the Primitive times, and the Eastern countries, was afterwards (to prevent wantonness, and to make the more expedition) commuted into a new custome, viz., a piece of wood or metall, with Christ's picture thereon was made, and solemnly tendered to all people to kiss. This was called the Pax, or Peace, to shew the unity and amity of all there assembled who, though not immediately, by the Proxie of the Pax kissed one another.

Item: For a pair of Censers, copper and gilt, nine shillings and eightpence.

Item: For a Stock of brass for the Holy water seven shillings (which by the Canon must be of marble, or metall, and in no case of brick, lest the sacred liquor be suck'd up by the spunginess thereof).

Item: For a Chrismatory of pewter, three shillings and fourpence. (This was a vessel in which the consecrated oyl used in Baptisme, Confirmation, and Extreme Unction was deposited.)

Item: For a yard of silver sarcenet for a cloth for the Sacrament, seven shillings and eightpence.

Item: For a Pix of Pewter, two shillings.

Item: For Mary and John that stand in the Rood loft, twenty-sixe shillings and eightpence. (Christ on the Cross saw his mother and the disciple whom he loved standing by. In apish imitation whereof the Rood was attended with these two images.)

Item: For washing eleven Aubes (albs) and as many Head-clothes, sixpence.

Item: To the Apparitor, for the Bishop's book of Articles at the Visitation, sixpence. (This Bishop was Bloudy Bonner, that Corpulent tyrant, full as one said, of guts, and empty of bowels; who visited his Diocess before it was sick, and made it sick with his Visitation.)"

In Elizabeth's reign, of course, the accounts take a different turn, and Fuller naturally expresses his great satisfaction thereat.

"1558. *Elizabethæ primo.*

Imprimis: For the taking down of the Rood Loft, three and twopence. (If then there living and able, I hope I should have lent an helping hand to so good a work, as now I bestow my prayers that the like may never in England be set up again.)

Item: Received for a suite of Vestments, being of blew velvet, and another suite of damask, and an Altar Cloth, four pounds.

Item: For three Corporasses, whereof two white silke, and one blew velvet, two pounds thirteen shillings and fourpence.

Item: For two suites of vestments, and an Altar-cloth, three pounds.

(Now was the superstitious ward-robe dispersed, and that, no doubt, sold for shillings which cost pounds. They were beheld as the garments spotted with sin, and, therefore, the less pity to part with them.)

1562. Item: For a cloth of Buckeram for the Communion-table, and the making, four shillings."

Fuller remarks of the year 991, "England had at this time more Flesh, or Fat then Bones, (wherein the Strength of a Body consists); moe

monks then Military men. England then as much wanting martiall men as since it hath surfeited with too many of them."

Of William the Conqueror, he says: "As he conferred power on, so he conferred profit to, the Clergie. Witness his charter granting them thorow out England, tythes of calves, colts, lamb, milk, butter, cheese, woods, meadows, mills, &c., which charter is concluded ('t'is the strong hem keeps all the cloth from raveling out), 'Qvi decimam detinverit per jvstitiam Episcopi et Regis (si necesse fverit) ad redditionem argenator.'" Who shall detain his tythes, by the power of the Bishop and King (if need be), let him be argued into the payment thereof. "And King's arguments we know are unanswerable as 'ab avthoritate' carrying power and penalties with them."

Some entries again from Waltham of an earlier date than those already mentioned, with Fuller's remarks thereon, are as follows:—

"1,544. Received of Richard Tanner for eight Stoles, three shillings. (A stole was a vestment which the priest used. Surely these were much worn, and very rags of Popery, as sold for fourpence halfpenny a piece!)

Paide for mending the handbell, twopence. (This was not fixed as the rest in any place of Church, or Steeple, but, being a Diminutive of the Saints' Bell, was carried in the Sexton's hand at the circumgestation of the Sacrament, the visitation of the sick, and such like occasions.)

1,549. Sold the silver plate which was on the desk in the Charnel, weighing five ounces, for twentie-five shillings.

Sold a rod of iron which the curtain run upon before the Rood, ninepence.

Paide for halfe of the Book called Paraphrase, five shillings. (By the eleventh injunction of King Edward, each Parish was to procure the paraphrase of Erasmus, namely, the first part thereof on the Gospels, and the same to be set up in some convenient place in the Church.)"

After some remarks on the decay, spiritual and otherwise of the Monasteries and Abbeys, Fuller says of the latter, "There was scarce a great Abbey in England, which once at the least was not burnt down with lightning from heaven. The Monastery of Canterbury, burnt anno 1145, and afterwards again burnt anno 1174; the Abbey of Croyland, twice burnt; the Abbey of Peterborow, twice set on fire; the Abbey of St. Marye's, in York, burnt; the Abbey of Norwich, burnt; the Abbey of S. Edmonds, Bury, burnt and destroyed; the Abbey of Worcester, burnt; the Abbey of Glocester was also burnt; the Abbey of Chichester, burnt; the Abbey of Glastonbury, burnt; the Church of the Abbey of Beverley, burnt; the Steeple of the Abbey of Evesham, burnt. I will not, with Mr. Fox, inferre from such casualties, that God was more offended with Abbeys than other buildings, a naturall cause presenting itselfe of such accidents, namely, because the highest structures (whatever they are) are the fairest marks for lightning and thunder."

"637. In this year, Honorius, Archbishop of Canterbury divided England (understand so much thereof as was Christian) into Parishes. But that most exquisite Antiquary seems very unwilling to admit so early and ancient Parishes in the modern proper Acceptation of the word. Who knoweth not that Parochia at large signifieth the diocese of the Bishop, and two new Dioceses (Dunwich and Dorchester) were erected under Honorius in the Province of Canterbury. But whether Parishes are usually understood for places bounded in regard of the Profits from the People therein, payable only to a Pastour incumbent there. I say whether such parishes were extant in this age, may well be questioned as inconsistent with the Community of Ecclesiastick Profits, which then seemed joyntly enjoyed by the Bishop and his Clergy."

"887. Councils (except Councils of Warre) were very rare in this age. The first I find a solemn one, celebrated by King Alfred; the place not expressed, but the Canons therein fairly transmitted to posterity. The preface of these Canons is very remarkable, consisting of three parts.

First. The ten Commandments, translated into Saxon, as being the Basis and Foundation of all Humane laws.

Second. Severall pieces of Chapters in Exodus, being the Breviate of the Judiciall Law of the Iews, which though in the Latitude thereof calculated only for the Iewish Commonwealth, yet the morall Equity therein obligeth all Christians.

Third. The sixteenth Chapter of Acts, containing the Council of Ierusalem, as being a Divine Precedent, or Warrant for Christians to convene together and conclude Orders for regulating men's Conversations.

It is remarkable that in the aforesaid Ten Commandments, as exemplified in this Council of Alfred, the second Commandment is wholly expurged. Image-worship, beginning then to grow common in the world, and the clergy who gained thereby (hating the second Commandment on the same account as Ahab did Micaiah, because it ever prophesied evil unto them), dashed it out of the Decalogue. (N.B.—As now, 1891, in the Roman Catholic Church, the second Commandment is omitted, and the tenth divided into two, to make up the number.)"

"928. I must not omit the distances and degrees of Persons of this Age, collected from their VVeers, or VVeer gilds, that is, taxes and valuations;—it being truly to be said in that age,

"Quantum quisque sua Nummorum servat in Arca,
Tantum habet et Fidei."

Every one's testimony in Law cases in Courts was credited according to his wealth.

1st. Ceorles (whence our Northern word Carles, and common word, Churls), being Cowntrey Clowns, whose Weer-gild was two hundred shillings, or ten pounds; the same with Villanes, who held land in Villanage of others. These, if by blessing on their industry, they rose so high, as to have five hides of land of their own, with a place in the King's Court, and some other Priviledges now hardly to be underslood, were advanced to be Thanes.

2nd. The Weer-gild, or value of a Thane, was six times as much as a Churle or Villane, namely, twelve times a hundred shillings, therefore termed a twelve-hind-man, whose Oath in Law was equivalent to six Oaths of Churles or Villanes, as a Shilling passing in payment countervaileth six twopences. Note that if a Masser, or Merchant, pass the Great Sea thrice (understand the Mediterranian, not the narrow seas betwixt us and France), and not in the Notion of a Servant, but on his own account, he then was dignified with the reputation of a Thane. These thanes were of two sorts: Messett Thanes, Priests qualified to say Masse; and Worrould Thanes, that is, secular or Temporall Thanes. Thirdly, of the first, if a Scholar made such proficiency in his studies that he took Holy Orders, he was reverently respected, and (though not valued as a Worrould Thane in rates and taxes), Amends were to be made for any wrongs done unto him, equall to a Thane; and, in case he should be killed, the penalty thereof was the higher the more Orders the person had taken. Observe, by the way (so far as we can understand the Saxon laws), that Man's Slaughter was not then punished with death, but might be redeemed by the proportionable Payment of a summe of mony, according to the Quality of the Person slaine; part thereof payable to the King, part to his Kindred, part to the Countrey thereabouts.

But the further prosecution hereof (where the Footsteps are almost outworn with time) we leave to more expert Antiquarians, who will tell you that Aldermen in that age was equal to our moderne Earle, who, with Bishops, were of the same valuation; also that Comes in that age sounded as much as Duke in ours, Archbishops going along with them in all Considerable Equipage."

"1408. Sautre, a priest, condemned for heresy, and afterwards burnt. He was solemnly degraded from the priesthood in order as followeth:—

From the order of	1. Priest.	by taking from him	1. The Patin, Chalice, and plucking the Chasule from his back.
	2. Deacon.		2. The New Testament and the Stole.
	3. Sub-deacon		3. The Alb and the Maniple.
	4. Acolyte.		4. The Candlestick, Taper, Urceolum.
	5. Exorcist.		5. The Book of Congurations.
	6. Reader.		6. The Book of Church Legends.
	7. Sexton.		7. The Key of the Church door and Surphee.

1487. Richard III. endeavoured to work himself into people's good will by erecting and endowing of Religious Houses; so to plausibelize himself especially among the clergy. Thus he built one far North at Middleham, and a College in the parish of All Hallows Barking, hard by the Tower, as if he intended by the vicinity thereof to expiate those many murders which he therein had committed."

"1641. I am minded here of a crying sin of the English Clergy, conceived by the most conscientious amongst them to be a great incentive of Divine Anger against them, namely, the miserable and scandalous stipends afforded to their Curats, which made Lay Men follow their pattern in Vicaridges unindowed, seeing such, who knew most what belongs to the Work, allowed the least wages to the Ministry. Hence is it that God since hath changed his hand, making many who were poor Curats rich Rectors, and many wealthy Incumbents to become poor Curats. It will not be amisse to wish thankfulnesse without pride to the one, and patience without dejection to the other."

"The see of Worcester had nine Bishops successively. Four Italians; none of them lived there. Five (Latimer, Bel, Heath, Hooper, Pates); none of these died there, as either resigning, removed, or deprived, and all five were alive together in the reigne of Queen Mary."

At the end of the "Church History of Britain," Fuller gives a long account of Cambridge, with a most curious old map of all the buildings and Colleges. Anything relating to Cambridge, however, is generally so well known that we need not transcribe any of it here, and will now only add a few more notes on Waltham Abbey, which was built and endowed by Earl Harold, the brother-in-law of Edward the Confessor. Few traces are, however, now left of the original Monastery. Fuller says of the Church: "It is a structure of Gothick building, rather large then neate, firme then fair. Very dark (the design of those days to raise devotion), save that it was helped again with artificial lights; and is observed by artists to stand the most exactly East and West of any in England. The great pillars thereof are wreathed with indentings, which vacuities, if formerly filled up with brasse as some confidently report, added much to the beauty of the building. But it matters not so much their taking away the Brasse from the Pillars, had they but left the Lead on the Roofe, which is but meanly tiled at this day."

The following about Waltham Market is very quaint:—"We have new a Market on Tuesday, but cannot boast of much trading therein. Indeed there is plenty of Flesh, but little Corn brought thither, and Bread is the Staff as of a man, so of a Market. Nor let us impute the thinness of Chapmen in Summer to Husbandmen's having no leasure as busied in tillage, Hay, or harvest, or in Winter to their having no pleasure to repair thither in so deep and dirty wayes, seeing the plain truth is no underwood can thrive neer the droppings of so great an oke, the vicinity of London. The golden Market in Leaden Hall makes leaden markets in all the Townes thereabouts."

In the Waltham parochial accounts in 1556 is "Item for coles to undermine part of the steeple, which stood after the first fall, two shillings."

These coals were not for the purpose of blasting; but in Mediæval times, when a wall or tower was required to come down, it would be undermined, and be carefully supported with wooden shores, lest it should fall on the sappers and miners. Then a fire would be ignited round the props, and as the timber consumed, it would give way, and the whole superstructure fall to the ground.

The strong personality of the author, and his very decided opinions, make this History a very interesting one to look through, as may be seen from these extracts; especially so are the accounts of affairs near his own day, in which, of course, he took a more personal interest. A great writer speaks of the "deep slumber of a decided opinion." Fuller evidently had the decision without the slumber, as he seems to have been wide awake, and armed at all points with the courage of his opinions. But it was an age in which the why and wherefore of things had to be sharply defined.

West Ham.—The Town Council of West Ham have instructed Mr. Lewis Angell to prepare designs for two Free Libraries, one in the northern and one in the southern division of the Borough, at a cost of 16,000*l.*

THE SURVEYORS' INSTITUTION EXAMINATIONS:

FOR THE PROFESSIONAL ASSOCIATESHIP.

THE following Student Candidates have passed the Examination for the Professional Associateship:—

Abrams, B. P.	Franklin, B. B.	Soutter, E.
Bowden, E. N.	Green, E. H.	Temple, F. W.
*Bowden, J. F.	Lawley, F. W.	Tuckett, P. F.
Buckland, S. C.	Oakley, C. P.	Walkington, F.
Carr, T. E.	Robins, P. S.	J.
†Finn, H. A.	Sedgwick, R. W.	Windley, H. C.

* Institution Prizeman, 1891. † Special Prize, 1891.

The following Non-Student Candidates have also passed the Examination for the Professional Associateship:—

Barton, E. W. E.	Dolamore, F. P.	Poggio, E. J.
‡Beasley, J. A. L.	Hollis, H.	Richardson, O.
Brown, A. B.	Hollis, R.	A.
Castle, H.	Jessett, C. E. V.	Robinson, H. H.
Corderoy, A.	Joyce, H. W.	Thurgood, A. E.
Crawshay, L. R.	Longsdon, E. M.	Walker, J. A.
Crier, J. T.	Mitchell, G. S.	Wilks, E. S.
Cross, A. C. M.	Moses, H.	Wilson, J. C.
Davis, N. B.	Muller, J. J.	Woodward, W.
Debenham, H. B.	Palmer, W. E. K.	H.
		Young, H. A. L.

‡ Driver Prize, 1891.

FOR THE FELLOWSHIP.

The following candidates have passed the Fellowship Examination:—

Austin, R., jun.	Eve, H. T.	Mould, G. H.
Aylen, C. H.	Griffiths, H.	Oakley, J. H.
Ball, W. A.	Hadley, F.	Parris, C. J.
Barnes, G. F.	Hall, W. T.	Perkins, W. F.
Boulting, F. E.	¶Head, J. G.	Punchard, F. B.
Bushell, H.	Higgins, G.	Saunders, C. H.
Done, J. J.	Maun, R. B.	Wood, C. B.
Eagland, W. F.		

¶ "Crawter Prize," 1891.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

THE eleventh voluntary pass examination of candidates for the offices of Municipal Engineers and Surveyors to Local Boards, carried out by this Association, was held at the Institution of Civil Engineers (by kind permission) on Friday and Saturday, the 17th and 18th inst. Ten candidates entered themselves for examination, the written portion of which was taken on the first day. The greater part of the second day was occupied with the *viva-voce* portion of the examination. The examiners were:—1. For Engineering as applied to Municipal Work, E. B. Ellice-Clark, M.I.C.E., Past-President. 2. Building Construction, T De Courcy Meade, M.I.C.E., Vice-President. 3. Sanitary Science, Jas. Lemon, M.I.C.E., &c., Past-President. 4. Public Health Law, W. Santo Crimp, M.I.C.E., Member of Council.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of this Society was held at the School of Art on Tuesday evening last. Mr. Innocent, the vice-president, presided, in the absence of Mr. Fowler, the President. There was a good attendance of members. Mr. Reginald T. Blomfield, M.A., read an interesting paper on "Drawing." Mr. Blomfield said he had advisedly avoided the title of "Architectural" drawing, for the reason that, to the general public, such a subject was too often a matter of indifference. He should divide his subject into three parts:—"Shorthand Drawing," or the kind of drawing necessary for an architect who desires to obtain a record of existing buildings for practical use; "Æsthetic or Record Drawing," which he defined as an artistic rendering of existing buildings or of buildings about to be erected; and "Technical Drawing," which was the architect's vehicle for explaining his ideas to the craftsman. The first named,—"Shorthand" drawing,—had to be done in out-of-the-way places, on the tops of ladders or other coigns of vantage. No matter how dilapidated or dirty the drawing was, so long as it gave an accurate record for purposes of study and practical use, it answered its purpose. The value of such work lay in the mental process evolved in its execution. To make such a drawing against time was a difficult analytical process. "Æsthetic or Record" drawing was the art of representing an existing or proposed building in such a manner as to explain its perspective, grouping, and general character in an interesting manner. This should be done without the trickery and fussiness of so many modern draughtsmen. Mr. Blomfield then noticed the illustrations of Inigo Jones, Hollar, Piranesi, Cotman, and the drawings of the great masters of the earlier and later Renaissance, which were models to the modern student of the correct way of delineating architectural works, and had never been surpassed. He strongly objected to the modern competition system of perspective drawing as misleading and valueless. The old masters grasped the details of their work, and were not overwhelmed by them. Above all things he advised young draughtsmen to avoid tricks; to be original and natural, and not copy the work of other people. He also reminded his hearers that unless such drawings had artistic merit the public would care little for them in the long run. Passing out to speak of drawing as a technical method for the use of the craftsmen, he advised young students to throw their whole hearts into the work, and make their drawings full of feeling and accuracy, and to cultivate the drawing of the human figure from the antique and from natural objects. This would impart freedom and accuracy of touch. Above all, he advised architects to look to a noble ideal, and to let their boast be that they were masters of their craft, and artists as well as architects. In the coming time the public would appreciate such a standpoint. A vote of thanks was accorded to the lecturer, on the motion of Mr. J. B. Mitchell-Withers, seconded by Mr. E. M. Gibbs, and supported by Messrs. C. Hadfield, J. Smith, and the Chairman. The hon. secretary announced that the concluding paper of the session would be read by Mr. Paul Waterhouse, M.A., on "The Rising Generation of Architects."

EDINBURGH ARCHITECTURAL ASSOCIATION.—About thirty members of the Edinburgh Architectural Association visited Winton Castle, Pencaitland, on the 18th inst., by permission of Mr. and Mrs. Hamilton Ogilvy. Mr. Thomas Ross, architect, who acted as leader of the party, in sketching the history of the house, explained that it was destroyed by the English in 1620. The then Earl of Winton built the present house, on which shortly afterwards alterations were made, presumably by Mr. William Wallace, the architect of Heriot's Hospital. The old ceilings, especially in the drawing-room and King Charles' room, were much admired, and Mr. Ross pointed out that similar ornaments were used at Pinkie and Moray Houses. Pencaitland Church was then inspected, under the guidance of the Rev. James Coullie, B.D. The earliest portion of the church was built in the fourteenth century, the main part in 1560, and the west tower was added in 1631. The window, by Kemp, to the memory of the late Lady Ruthven, was much admired for its design and colouring. Fountainhall House was afterwards visited, and Mr. Patrick Robertson, the tenant, showed the party over this specimen of the sixteenth century Scottish mansion.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting of this Association on the 15th inst., Mr. J. W. Grover, F.S.A., was in the chair. A description was rendered by Mr. Loftus Brock, F.S.A., of the mass of Roman walling east of the Newport Arch, Lincoln, on the line of the city wall. It proves to be a portion of a building as well as of the city rampart, since there are remains of a vaulted passage on its south side. Portions of red concrete from some other Roman building are used as old material. Mr. Oliver exhibited drawings of encaustic tiles found in 1840 on the site of St. Stephen's Chapel, Westminster. The Rev. S. M. Mayhew read a paper on Roman murrhine glass, and exhibited many beautiful specimens of ancient date, as well as of Salviati's modern reproductions. A fragment of a Roman pavement of fine work, which has recently been found at Burgate, Canterbury, was also exhibited. Mr. Earle Way described a collection of Roman and Mediæval articles which have recently been excavated at Southwark, among which was a fine Flemish jug and a Roman horse-shoe made with a projection to allow of its being strapped on to the horse's hoof. A paper was then read by Mr. Salt Brassington on the ancient Library of Gloucester Cathedral. The Mediæval library was dispersed on the suppression of the monastery, but a few of the MSS. in the British Museum can be identified as having formed part of it by inscriptions. Some of the MSS. were taken to the King's Library, probably by Leland's advice. The formation of the present Post-Reformation Library was traced, and its indebtedness to the Puritan Captain Pury, who kept watch in the cathedral, on which a cresset was lighted to show to the country that the city still held out against Charles I. The principal books in the library were described, and a beautiful series of drawings and rubbings of the most remarkable of the ancient buildings was exhibited,—the marks of the binders being indicated.

GLASGOW ARCHÆOLOGICAL SOCIETY.—The monthly meeting of the Glasgow Archæological Society was held on the 16th inst. in the Philosophical Society's Rooms, Bath-street, Mr. John Honeyman, President, in the chair. The Rev. J. King Hewison, Rothesay, read a paper on "Bute and the Celtic Church." The Rev. Archbishop Eyre submitted copies of an ancient inscription in the chapel-house of Glasgow Cathedral, and Professor Young exhibited a font found in an old bed of the Clyde. Regarding the threatened destruction of certain old monuments in the Cathedral graveyard, Mr. W. G. Black reported that several interviews had taken place with Sir James Marwick and members of the Town Council, with very satisfactory results. As far as possible the monuments would be preserved, and only where there was really danger to the public would they be interfered with.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday afternoon last, the Chairman, Sir John Lubbock, presiding.

The Egyptian Obelisk on the Victoria Embankment.—The Report of the General Purposes Committee contained the following paragraph,—

"Mr. Dyer, the Director of Kew-gardens, has mentioned to the Chairman of the Council that there is at Kew a marble tablet on which is inscribed an account of the British operations in Egypt in 1798-1802. This tablet is stated to have been originally fixed on the base of the Egyptian obelisk which was brought from Egypt to this country and set up on the Thames Embankment in the year 1878. Mr. Dyer thought that the Council, having the care and control of the obelisk, would be a more fitting custodian of the tablet than the authorities of Kew-gardens. Feeling that the Council would concur in this view, we accepted with thanks Mr. Dyer's courteous offer, and have given directions for the tablet to be removed from Kew to the office of the Council."

Proposed Extension of Tramways over Westminster Bridge on to the Embankment.—The Highways Committee presented a report on the London Tramways Company (Extensions Bill), stating that—

"On the 3rd of March the Council gave its consent to the introduction of this Bill, in order to enable the promoters to comply with the standing orders of the House of Commons; this consent, however, being subject to an express undertaking by the promoters to withdraw the Bill, if at any time the Council should require them so to do. By the Bill power is sought for an extension from the present terminus of the Company at the south side of Westminster Bridge, across the bridge and along the Victoria Embankment, and terminating under the Charing-cross Bridge of the South Eastern Railway, the total length being about three-quarters of a mile.

We have taken the subject of this Bill into serious consideration. It will be recollected that a petition, signed by over sixty thousand inhabitants of the districts south of the Thames, was presented to the Council in favour of the Bill, and upon the best evidence procurable we have satisfied ourselves that there is a *bonâ-fide* demand for the contemplated extension. It has been impossible, however, for us to exclude from our consideration the fact that the proposed line would involve the occupation, by what may be described as an unelastic traffic, of a most important bridge and of a thoroughfare which have been constructed at an enormous expense at the cost of the metropolis. The case possesses exceptional features, not only by reason of the very great importance of the thoroughfares over which it is proposed to carry the lines, but also from the fact that these roads are under the exclusive jurisdiction of the Council. Under these circumstances we are of opinion that the ownership of the tramway should vest in the Council from the outset, and that the work of construction and the future maintenance of it should be performed by the Council itself. We have given effect to this view in the clauses appended.

We are of opinion that stringent conditions should be attached to any consent to a private company for an undertaking which cannot but yield a

very substantial profit. After a very careful discussion of the whole subject, we have decided to recommend :—

(*a*) That the Council do attach the following conditions to its consent to the progress of the London Tramways Company (Extensions) Bill :—

That an agreement to the following effect, between the promoters of the Bill and the Council, be entered into and scheduled to the Bill :

1. At any time within twelve months after the passing of the Act, it should be lawful for the Council, on payment to the company of the costs of obtaining the Act (the amount, if not agreed, to be settled by the Taxing Officer), to resolve that all the powers conferred upon the company by the Act shall be transferred to and become thereafter exercisable by the Council, and upon notice to that effect being served upon the company, the powers for the construction of the tramway shall be transferred to the Council, and if no such notice be given within the twelve months all the powers of the Act shall cease.

2. The company to work the tramways.

3. The company to pay in respect of the user of the bridge and the embankment a rent, payable half-yearly, of an amount to be hereafter settled and reported to the Council for approval; and in the event of such rent not being agreed upon, this agreement to cease and the Bill to be withdrawn.

4. This working arrangement to continue no longer than August 10, 1898; but to be renewable at that time should the parties think fit.

5. The laying down, maintenance, repair and renewal of the tramways to be in the hands of the Council.

6. The Council to have the right of prescribing the number of cars, and the times of their running.

7. The through fares from terminus to terminus not to be increased by reason of this extension

8. The Council to have the power of prescribing the number of workmen's cars to be run each way; the last of such cars to start not earlier than 7.30 a.m.; the maximum fare to be ½d. per mile, and the maximum through fare 2d.

9. The Council to be at liberty to admit any other Company to the use of the tramway.

10. If at any future time the Council should exercise the power of purchase, conferred upon it by law, of any portion of the Company's system, the value of such portion not to be increased by reason of the present extension.

11. Should the Embankment portion of the line not be authorised by Parliament, the Company to withdraw the Bill.

12. All costs, charges, and expenses in relation to the agreement and the Bill to be paid by the Company.

(*b*) That the Parliamentary Committee be instructed to settle the clauses and to superintend their insertion in the Bill.

These conditions were all agreed to after some discussion, with some verbal amendments in the last-named recommendation (*b*). And on the motion of Mr. J. Williams Benn, seconded by Mr. John Burns, the following additional clause was carried by 51 votes to 33, viz. :—

"Every person employed by the company upon or in connexion with any portion of this extension of the tramway shall be employed on the terms of not being required to work for a longer time than ten hours a day."

The Proposed New Thoroughfare from Charing Cross into the Mall, St. James's Park.

The Improvements Committee reported as follows on this subject :—

"We have considered the following resolution of the Council of December 16, 1890, No. 28 :—

'That the Improvements Committee be requested to inquire and report to the Council what arrangements, if any, could be made with the Department of Her Majesty's Works and Public Buildings to open a carriage road into Charing-cross, in continuation of the Mall, to be used under the same restrictions as the road through Storey's-gate.'

We lost no time in proceeding with the consideration of this reference. We invited Captain James, the mover, to attend and explain his views, and we had a plan prepared in conformity therewith. This provided for a widening of the thoroughfare opposite the Council's offices, from 20 ft. to 50 ft., and at a point opposite the south side of Spring-gardens, diverging west so as to throw into the thoroughfare a wedge of property having a frontage in Cockspur-street of about 55 ft. This divergence was suggested so as to avoid the valuable bank property on the other side of the street. We came to the conclusion, however, that this improvement, although not devoid of value, would not present such a thoroughfare as we could recommend, and we instructed the Engineer to prepare an alternative plan for prolonging the Mall to Charing-cross in a straight line. In the course of investigating the disposition of Her Majesty's Office of Works in regard to such an improvement, it being necessary to ascertain what portion of the site originally acquired for the new Admiralty Offices could be appropriated for the proposed new street, we learnt with satisfaction that the Government contemplate re-arranging the whole of the site extending from Spring-gardens to the Horse Guards, and that they, in fact, have arranged for the formation of a road, 75 ft. wide, from the Mall to Charing-cross. Although it appears that this new access to St. James's Park cannot be available for heavy traffic, yet it is unnecessary to say that for pedestrian and light vehicular traffic it will be of so great a public service as to make the improvement when carried out by the Government one of the most valuable which this Council has had brought under its notice.

We have to report to the Council that it appears by the Government plan which we have seen, that some land opposite the Council's offices will probably be available, should the Council desire to acquire it, for additional office accommodation, and we have directed that all the particulars in our possession shall be supplied to the Offices Committee in case it may wish to investigate the matter."

The Public Health (London) Law Consolidation and Amendment Bills.—The Sanitary and Special Purposes Committee presented a report stating that the Committee had considered very carefully the provisions of these Bills, and they submitted various suggestions for their amendment, which had been prepared by a Joint Committee consisting of representatives of the Sanitary Committee, the Housing of the Working Classes Committee, and of the Parliamentary Committee. This report we defer until next week.

After transacting other business, the Council adjourned.

THE SANITARY INSTITUTE:

EXAMINATIONS FOR INSPECTORS OF NUISANCES.

AT an Examination for Inspectors of Nuisances, held in London by this Institute on April 10 and 11, eighty-nine candidates presented themselves. Questions were set to be answered in writing on the 10th, and the candidates were examined *viva voce* on the 11th.

The following sixty candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspector of Nuisances :—

Addison, S.	Gillespie, Rev. C. G. K.	Peake, T. J.
Bazley, J.		Pemberton, O.
Bland, J. S.	Gray, H. G.	Powell, C. J.
Bubb, J. T.	Green, E. A.	Roe, E. C., jun.
Carter, A.	Grivell, E. J.	Rossiter, R. H.
Cary, A. S.	Hardy, G. H.	Shepherd, W. J.
Cass, R. W.	Harris, G.	Simmons, E. J.
Clarke, J. H.	Henwood, J. H.	Singleton, T.
Collins, H. B. M.R.C.S., L.S.A.	Hyslop, J.	Smith, J.
	Kershaw, E. B.	Smith, W. B.
	King, A. S. W.	Stanley, W.
Corp, J.	Laird, J. C.	Sumner, J.
Crane, J.	Lewis, S.	Switzer, S.
Culling, J. G.	Lloyd, C.	Thatcher, A.G.H.
Curtin, W. H.	Locke, W. R.	Thompson, R.
Dale, D.	Mackie, A.	Toynbee, W. S.
Dawson, J. M.	Mager, F. W.	Turner, W. H.
Docking, F. R.	Martin, W., jun.	Vincent, G. E. B.
Drake, J.	Milner, W.	Whittome, P. A.
Dyke, A. W.	Morgan, W.	Wilde, A. J.
Earwicker, J. C.	Paramor, R. W.	Worrall, E.

COMPETITIONS.

ROCHDALE TECHNICAL SCHOOL.—We are officially informed that the following firms are the authors of the designs which have been placed first and second respectively by the assessor, and which have been premiated by the committee :—Messrs. Smith, Woodhouse, & Willoughby, Manchester; Messrs. Butterworth & Duncan, Rochdale. The nineteen sets of plans have been open for inspection by competing architects during two days of this week.

DECORATION OF THE PHILHARMONIC CONCERT HALL, LIVERPOOL.—About the beginning of February the Committee of the Liverpool Philharmonic Society advertised that they were desirous of receiving designs for the decoration of their concert hall, and offered three premiums —50*l.*, 25*l.*, and 15*l.* In response to this their secretary was the recipient of over twenty designs, all under cypher, from London, Liverpool, Manchester, Edinburgh, &c. The competition has just been decided, and the first premium of 50*l.* has gone to Edinburgh, Messrs. George Dobie & Son, George-street, being the successful firm. Messrs. Dobie have been entrusted with the execution of the work.

THREATENED STRIKE OF CARPENTERS.—In view of the threatened strikes of carpenters and joiners on May 2, the Central Association of Master Builders of London have sent out a circular to all employers in the trade, pointing out the necessity of combination among them, and inviting those who do not belong to the Association to submit their names for election. Meanwhile, the executive of the union are taking steps to carry into effect the terms of the resolution adopted at an aggregate meeting of the trade at Exeter Hall on the 17th inst., when it was decided by a majority of 3,227 out of a total of 5,109 votes recorded to "instruct the committee, in consultation with the shop and job delegates, to take such steps to enforce the demands made by striking such firms, in detail, as they may deem necessary, on May 2." The men, it is stated, demand an increase of wages from 9d. to 10d. per hour, and a reduction of working hours to forty-seven per week. The Masters' Association have replied that they could not see their way to agree to the proposed alterations.

Correspondence.

To the Editor of THE BUILDER.

THE LATE J. D. SEDDING.

SIR,—Permit one more brother architect to pay, for himself and a certain circle of friends around him, in one place, some affectionate tribute of feeling about the early death of John Dando Sedding, who will always be associated in their minds with some pleasantest days of companionship in architectural excursions. To remember him as they appreciated him is to remember a very remarkable character indeed, an original genius without pride; earnest and impulsive, with the gentlest and most unselfish of dispositions; with it an imcomparably winning grace of manner that compelled friendship.

There is a melancholy pleasure in recalling the pleasantries of those days of companionship, into which he entered with such happy temper, and the characteristics of his sayings and doings. One recalls that wonderful heavily-bound sketch-book, with the Bramah lock on it, like a ledger, in which, according to some, Sedding was presumed to enter his sketches on some system of double entry. One recalls, too, the clever, dashing, impatient sketching in the book —inked in, pencilled in, coloured in, stumped in, anyhow, "so as you got it." Then one recalls an inscription tendered to him by another pleasant spirit (who is, alas, gone from us, too), and alleged to have been taken from an eighteenth century monument. As well as I remember, it ran thus :—

> "Mark clever John Dando,
> That sketches so grand O.
> What he does with his pencil
> He smears with his hand O."

I am one of those who would desire to have some memorial of the works and genius of poor Sedding, to place with those of Edmund Sharpe, of Page and Pink, brightest and pleasantest of companions, lost in past years to the fellowship of the A.A. D.

Dublin, April 20, 1891.

COMPETITIONS.

SIR,—The promoters of competitions usually expect buildings to be erected at a cost that is too low to be possible, and I think the "Newton-in-Makerfield Improvement Commissioners" have established a record.

I copy the following extracts verbatim from the "Instructions to Architects" :—

"The Commissioners desire that the elevations should be carried out in Ruabon pressed brick, with stone dressings.

The following are the principal rooms to be provided, with the necessary strong rooms, which, as far as possible, should be fireproof :—Clerks' offices, about 700 sq. ft. area; Surveyor's offices, about 800 sq. ft. area; gas-testing room, collector's offices, about 700 sq. ft. area; nuisance and market inspectors', about 500 sq. ft. area . . . . school attendance office and waiting-room, about 600 ft. area; ante-rooms, lavatories, &c., hall-keeper's house, with three bedrooms; staircase and entrance, surmounted with a clock tower; board-room, about 700 sq. ft. area; committee and waiting-rooms, about 800 sq. ft. area: assembly-room, to seat 600, exclusive of platform and end gallery; three retiring-rooms and serving-room; side staircase and entrance . . . . A basement floor for heating apparatus, cooking arrangements, and stores."

These moderate requirements are to be carried out at a "*proposed outlay of* 4,500*l.* . . . . *which must not be exceeded.*" I should say it would be a cheap building at 15,000*l.* The worst of it is that the guinea deposited, before receiving the particulars, is confiscated unless a design is sent in complying with the requirements; and, as that is absolutely impossible, it appears to me that all the guineas will be pocketed. Is there no redress? I trust you will find space for this, as the advertisement is still appearing, and this may lead some to save their guineas. "AMAZED."

STRIKES AND BUILDING TENDERS.

SIR,—In view of the very possible disturbance of the wages question throughout the building trade, I am much perplexed in connexion with tendering, and should be glad to hear the expression of some views on so important a subject, not only from builders, but from architects also, who, we feel, are equally concerned in the equitable and fair adjustment of such a question, inasmuch as it ultimately affects their clients. Excepting as to the speculating builder (who primarily builds for himself), I consider that any action that might be taken by the master builders in the event of a strike or a lock-out would simply be a fighting the battle of the public at large, and as such I cannot see any ground whatever upon which builders can be

expected to stand the brunt of such a contest, or bear the increased cost of production. At the present moment I have three or four estimates in my office, but should not think of tendering unconditionally, whether my tenders be entertained or not, but rather upon the basis of some such system of adjustment as that propounded in Laxton's Price-book for this year (in the article following the preface), unless some other or better suggestion can be offered. You will see at once that this question is altogether outside the ordinary "strike clause," which merely deals with the question of delay through strikes, but has no bearing whatever upon a general and recognised rise in wages. I venture to think that architects may well be invited to discuss such a question.

A London Builder.

BIRMINGHAM LAW COURTS.

Sir,—Your kindly notice of our action in regard to the proposed additions to the above refers to the site as at the back of the Law Courts, whereas it is really at the front, and *one* reason for our wish that Messrs. Webb & Bell should carry out the work is that the buildings to be erected must, from their position, make or mar the whole design as seen from the principal approach from the centre of the city, and it therefore becomes especially desirable that the work should be carried out under the same able direction.

I append a sketch plan, which will show the importance of the site to be built upon.

Herbert R. Lloyd, Hon. Sec.
Birmingham Architectural Association.

*** Mr. Lloyd's letter is accompanied by a sketch-plan, showing the site for new buildings as projecting beyond the Corporation-street front of the Law Courts, so as to block out part of the front elevation of the latter to a spectator coming down Corporation-street. We could hardly have believed that the Birmingham Corporation could have proposed, after getting a building of which their city ought to be proud, to block part of it out, from the most important point of approach, by a building of independent design but in direct contact with it. We hope the recommendation of the Birmingham Association will be attended to.

THE OLD EAST INDIA HOUSE.

Sir,—Can any of your readers say what became of the groups of statuary that were on the top of the portico of the old East India House, in Leadenhall-street, which was pulled down thirty years ago?

J. H. M.

The Student's Column.

VENTILATION AND WARMING.—XVI.

FANS.

From the very large number of different forms which, as we have already said, ventilating fans have taken at the hands of various designers, it will be readily understood that considerable variety of opinion, or an imperfect comprehension of the conditions affecting the working of fans must have existed in the minds of some of their designers. Some of the many varied patterns have undoubtedly been brought into existence by the desire to have something to patent which seems a necessity for the stock-in-trade of a sanitary engineer.

We shall, therefore, point out in our treatment of the subject of ventilating fans what we gather from an investigation of the practical and scientific aspects of the question are the important points and the leading characteristics of ventilating fans.

Fans used for the ventilation of buildings are almost universally rotary fans, the punkah of India being hardly suitable for our purposes.

Rotary fans are principally of two classes: the centrifugal and the axial or helical. In the centrifugal fan the induced air current is tangential to the revolving fan or at right angles to the axis of revolution, in the axial or helical the induced air current is parallel to the axis of revolution, the former may thus be compared to the paddle wheel, the latter to the screw propeller of a steamboat.

Of these two classes the centrifugal fan is the older form, and under the name of a rotary blower or blast fan has been largely used for producing forced currents of air for iron manufacture, and also for the ventilation of mines. In America this form of fan has also been used somewhat extensively for the ventilation of buildings, the Sturtevant blower, which is now being introduced into England, being a fan of this character.

We will, therefore, consider each of these classes of fans separately, taking the older or centrifugal form first. We must, however, premise that the efficiency of any fan is to be estimated in terms of the volume, velocity, and pressure of the resultant induced air current as compared with the amount of horse-power required to produce that air current. Various forms of fan differ in respect to which of the three qualifications—volume, velocity, or pressure—they are best suited to develop. For example, the whole class of axial fans are more suitable where a large volume at low velocity and pressure is required, while centrifugal fans are better adapted for the production of high velocity and high pressure.

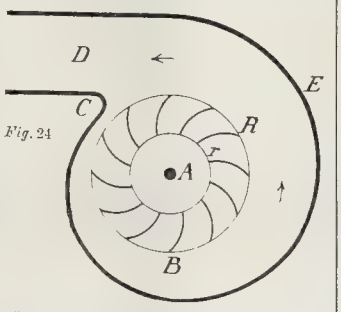


Fig. 24

In figure 24 we have a diagram not illustrating any particular patent, but arranged to show the important points of a centrifugal fan; the constructive detail is therefore omitted for the sake of clearness.

A centrifugal fan consists of a number of blades, B, rotating around an axis, A, in the direction of the arrows, and usually enclosed in an envelope or casing, E, and thus inducing a current in the duct, D, tangential to the revolving blades.

The inner edges of the blades do not extend to the axis, but are at a distance A r from it, their outer edges being concentric at the radius A R. Ordinarily the radius A $r = \frac{1}{2}$ A R, but the exact proportion is a determinant factor of the velocity and pressure. If high velocity or high pressure is required, the ratio of A r to A R should be decreased; if increase of volume is sought, the ratio should be increased.

In a centrifugal fan the air enters to the fan through the side or sides of the casing,—that is, through the circular opening of which A r is the radius, and is delivered from the periphery of the circle, radius A R.

The shape of the blades is the next point we may consider. They are sometimes made straight and radiating from the centre; sometimes curved, as shown in our diagram. Two considerations have to be taken into account in determining the form of the blades. First, it is desirable to maintain an evenly flowing stream passing centrifugally along the blades; second, regard must be had to the tendency of the blades to straighten under the centrifugal influence. Makers of centrifugal fans frequently adopt the straight-bladed form, as it is easier to construct and demands less strength in the blades, besides diminishing the weight. Straight blades, however, undoubtedly diminish the volume of the air-current obtained by the expenditure of any given energy. On the other hand, they render it possible to increase the velocity of revolution of the fan, and so tend to facilitate the attainment of higher pressure. The explanation of the decrease of volume resulting from the use of straight blades may

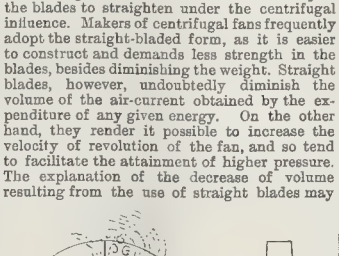


Fig. 25.

be seen in the diagram, fig. 25, wherein is shown the eddying that results from the use of straight blades by the increase of the width of channel along which the air is centrifugally passing. In the section shown in the same, fig. 25, the blades are drawn of diminishing width, a method that should be adopted to lessen the eddying, by keeping the sectional area of the centrifugal stream constant. At C is shown a conoidal addition to the axle, which also assists in maintaining regularity of current and avoiding the tendency to return currents, which diminish the efficiency of the fan.

With curved blades, the precise curve will vary with the velocity of the air current, but, as a general rule, a logarithmic spiral of 45 deg. appears to give the best results. A circular segment sufficiently approximating to this curve may thus be drawn. Assuming the radius A R of the fan to be unity, describe from centre A a circle of radius 0·597; this circle is the locus of the centres from which, with radius 1·194, the curves of the blades may be struck as segments of circles.

We now come to the envelope or casing, E (Fig. 24). This may be made either concentric with the fan or spiral, as shown in our diagram. The concentric form is the better for the development of high pressure in the induced air-current, the spiral form for the production of a large volume at lower pressure and velocity.

For the attainment of volume, the sectional area of the duct should be larger than that of the inlet, the circle, radius A r, in the proportion of about 7 : 5, while still further efficiency in this respect, with diminution of pressure, may be gained by making the duct, D (Fig. 24), trumpet-mouthed. On the other hand, if pressure is desired, the area of the duct should be diminished, and the duct may further decrease as it proceeds.

We have already said that centrifugal fans are adapted to the development of pressure in the air current, but it should be noted that very high pressure cannot be obtained from a single fan. The higher the velocity at which the fan revolves, the greater will be the resultant pressure, but the limits of the resistance of the blades to the centrifugal force prevent the attainment of very great pressure. A pressure equal to a head of 14 in. or 16 in. of water would require a dangerous velocity of revolution; 7 in. or 8 in. can only be obtained at very high speed, while 3 in. or 4 in. is as much as can be economically obtained from a single fan.

To obtain higher pressure it is more advantageous to connect fans in series, the second taking the air current at the pressure produced by the first and so on.

OBITUARY.

Mr. A. J. Baker.—We have to record the death of Mr. Arthur John Baker, aged sixty-eight, formerly an Associate of the Royal Institute of British Architects. He was the second son of Mr. Thomas E. Baker, J.P. for Middlesex. He was educated at Ashford, in Kent, and was afterwards articled to Sir William Tite. He first commenced practice by taking offices in the Poultry, and in 1856 became a partner in the firm of Wadmore & Baker, architects and surveyors, Great St. Helen's, E.C. The firm at that time prepared plans for the Foreign Office competition. Mr. Baker resided many years at Gravesend, where he superintended the laying out of a large building estate for the Right Hon. the Earl of Darnley, and also the Upton estate in Essex. In conjunction with his partner (Mr. Wadmore) he designed and superintended the erection of several churches, chapels, schools, warehouses, and other buildings in town and country. Failing health, however, induced him to retire in 1888, when he removed from Gravesend and went to reside at Eastbourne, where he died suddenly on the 13th inst.

Mr. William Tasker.—The death is announced of Mr. William Tasker, architect and surveyor, at the age of sixty-one. He spent his early professional career as a pupil of Mr. John Shaw, of Christ's Hospital, and in the office of Mr. Charles Freeman, and commenced practice on his own account in the year 1856, and carried out a great many important public and private works.

Mr. R. S. Wyld, C.E.—On the 18th inst. the death took place, at Colton, Oswestry, of Mr. R. S. Wyld, resident engineer to the Liverpool Corporation. Mr. Wyld had only been ill for a short time.

Mr. John Richards.—Mr. John Richards, clerk of the works for the Birmingham City Council at the Victoria Courts, died suddenly on the 16th inst. at his residence in Brighton-road, Balsall Heath. He was fifty-three years of age, and leaves four children. The appointment of the deceased as clerk of the works at the Victoria Courts dates from September, 1888. Prior to that he was employed, says the *Birmingham Gazette*, on a number of very large works in London, including public buildings under the Local Government Board. Mr. Richards is the third clerk of the works since building operations were commenced.

M. Chapu.—The Paris correspondent of the *Times*, telegraphing on Tuesday night, says that M. Chapu, the eminent French sculptor, died that morning of influenza. He was born in 1833, studied

under Pradier, Duret, and Cogniet, took second prizes at the School of Art in 1851 and 1853, and in 1855 gained the Prix de Rome. In 1863 he began exhibiting at the *Salon*, and in 1875 and 1877 carried off the first medal. He executed statues for the tombs of Henri Regnault, Leverrier, the Duchesse d'Orleans, and Flaubert. The following works by M. Chapu have been illustrated in the *Builder* during the last few years,—viz.: Sculptural Figures at the Magasins du Printemps, representative of the four seasons, "Le Printemps," "L'Eté," "L'Automne," "L'Hiver" (see the *Builder* for February 21, 1885); Monument Commemorative of the Siege of Paris (March 27, 1886); "Le Courage" (July 9, 1887); Monument to Bishop Dupanloup (January 21, 1888); and Memorial Statue to Le Verrier, Paris (May 18, 1887).

GENERAL BUILDING NEWS.

New Church, Scunthorpe, near Doncaster.—The new church of S. John the Evangelist, erected by Lord St. Oswald, of Nostell Priory, at the cost of 30,000*l.*, was opened by the Bishop of Lincoln, at Scunthorpe, near Doncaster, on the 15th inst. The building has been built of iron stone of the locality, and faced with Ancaster stone dressings, and is capable of accommodating 500 people. The architect was Mr. Crowther, of Manchester. Mr. Langridge was Clerk of Works.

Chancel, St. Matthew's Church, Rhymney.—The opening of the new chancel of St. Matthew's Church, Rhymney, took place recently. The extension consists of the nave being extended 10 ft., with a large new chancel and vestry and organ chamber. The total cost was 1,150*l.* The architect was Mr. E. M. Bruce-Vaughan, Cardiff, and the contractor Mr. J. Haines, Cardiff. In the chancel two stained-glass memorial windows have been fixed.

Proposed Hospital for Infectious Diseases, Blackburn.—Mr. Arnold Taylor and Dr. Thompson, Inspectors under the Local Government Board, held an inquiry at the small Police-court, Blackburn, on the 8th inst., into an application of the Corporation to borrow 15,000*l.* for the erection of the proposed new Infectious Diseases Hospital. The Town Clerk said that the Town Council had secured a plot of land at a cost of 2,976*l.* The site was about 1½ miles from the Town-hall, and it was 10½ acres in extent. Plans had been prepared in accordance with suggestions received from the Local Government Board. There were reasons, however, peculiar to Blackburn which proved that the hospital was absolutely necessary. There were in Blackburn 27,000 houses, and of that number 21,000 were rented at 5s. a week and under. Mr. M'Callum and Dr. Barwise were examined at some length by Dr. Thompson on the details of the proposed building, and subsequently the inspectors drove to the site.

Proposed Free Library and Offices for West Bromwich.—The question of the extension of the Free Library buildings at West Bromwich has again brought to the front the need of further office accommodation for servants of the Corporation. This subject was considered when it was proposed to erect the new Law Courts more than twelve months ago, but it was deemed advisable to keep the offices separate from these, and to defer the matter until the Law Courts were completed. Now that the new courts are practically complete, the Town Council have resolved to remedy the inconvenience which at present exists. Three schemes have been before the Council, and referred to the General Purposes Committee for further consideration: 1, Utilising the present Free Library as far as possible with office accommodation extended in the rear. 2, Utilising the site of the Free Library and erecting thereon the necessary offices. 3, Utilising the open market site facing the Institute Buildings in Lodge-road. The committee have enlarged upon the suggestion in No. 2 plan. It is now proposed to take down entirely the present Free Library buildings and erect on the site proper offices to meet all requirements, which would run parallel with the present offices and Council-chamber. The estimated cost of the offices is 5,000*l.* The committee will utilise the Market Hall, in which the temporary County Court is located, for the purposes of a Free Library. All the rooms will be on the ground-floor, and it is estimated that for 2,000*l.* it can be converted into a library and reading-room. The total cost will be about 7,000*l.*

The Church of St. Stephen, Southwark, has been re-opened, after considerable additions to the exterior and complete restoration of the interior. The nave has been re-seated throughout with oak benches. The chancel has been re-arranged, and a new oak pulpit and choir stalls, with elaborately carved ends, have been fixed. The sanctuary has carved oak chairs and prayer desks, and is separated from the nave by a brass altar rail supported on ornamental brass standards. The arch to the organ-chamber, and also the one in the south transept, have been filled in with oak screens with traceried heads. The three old gallery fronts have been removed, and new oak ones with panelled fronts and carved pillars have been introduced. The vestry has been panelled to match. The lighting in the nave is effected by one large corona. The chancel and vestry are lighted by smaller pendants of a similar character, the aisles having ornamental brackets. The whole of this work, including ornamental hinges and various sundries has been executed by Messrs. Jones & Willis, from the designs, and under the personal superintendence of, Mr. W. S. Weatherley, architect, London.

Public Hall and Institute for Woodhouse, Leeds.—In the rapidly-growing parish of St. Mark's Woodhouse, Leeds, the want of an adequate hall for public meetings and social gatherings has long been felt. There is, however, every prospect of a speedy realisation of this requirement, as the Misses March, of Beech Grove House, Leeds, have expressed their intention of building an institute for the district. Plans have been prepared by Messrs. Smith & Tweedale, architects, Leeds. The chief feature of the scheme is a lecture-room, on the first floor, 70 ft. by 40, giving accommodation (including the platform) for 600 persons. In connexion with the platform are two rooms which will be used for tea-making purposes or as dressing-rooms when entertainments are being given. A private staircase communicates with these rooms and the platform, the public staircase being at the other end of the building. On the ground floor provision has been made for a small lecture-room, reading-room, recreation-room, two committee-rooms, four lavatories, and caretakers' house. The basement (which is entirely out of the ground at the back) will form a covered playground for the adjoining infants' school. Access and light are obtained through a semi-circular arched arcade, the internal faces of the walls being constructed of white glazed bricks. The building will be faced with pressed bricks having moulded stone quoins and mullions. The west elevation will have two oriel windows of four lights each, the side elevation of the large hall will be broken up by six gablets having coupled lights, the platorm being lighted by a large rose window. The building will be heated by hot water.

Church, St. John the Baptist, Heaton Mersey.—The Church of St. John the Baptist, Heaton Mersey, Lancashire, is being restored and provided with a new chancel, which will increase the accommodation of the edifice. The work, which is expected to be completed during the summer, is being carried out from the designs of Messrs. Preston & Vaughan, architects, of Manchester.

Erection of a New Pier at Holyhead.—The contract has been let by the Government to Mr. William Williams, contractor, Holyhead, at about 3,000*l.*, for the erection of a new landing-slip at Holyhead leading from Newry Fawr down 7 ft. below low-water mark at spring tide, so that boats and vessels may be able to land at low water in all weather. This pier will be 300 ft. long.

New Free Libraries, Birmingham.—The Mayor of Birmingham (Alderman F. C. Clayton) on the 13th inst. laid the foundation-stone of the buildings which are to be erected as a branch Free Library at the junction of Icknield-street and Spring-hill, Birmingham, and Alderman Johnson, Chairman of the Free Libraries Committee of the City Council, performed a similar function on the site at the junction of Lingard-street and Saltley-road, where a branch library is to be provided for the wards of Nechells and Duddeston. The contract for the buildings at Spring-hill, which include a clock tower, has been placed with Messrs. Sapcote & Sons for 4,500*l.*, and that for the buildings in Bloomsbury with Messrs. W. & J. Webb for 3,900*l.* The architects for the first-mentioned branch library are Messrs. Martin & Chamberlain, and Mr. Jethro A. Cossins designed the Bloomsbury branch.

New Mills, Dunston.—On Saturday, the 18th inst., the new flour mills of the Wholesale Co-operative Society, at Dunston-on-Tyne, were formally inaugurated. The building has been built by the society's own workmen under the superintendence of Mr. John Armstrong, foreman mason, and Mr. Joseph Kearsley, foreman joiner, from designs by Messrs. Oliver & Leeson, architects, Newcastle, Mr. John Thompson, C.E., of Newcastle, acting as consulting engineer, while Mr. D. N. Brims was entrusted with the work of erecting the permanent jetty and slag bank which stretch out in front of the building. The mills, which are situate on the south bank of the Tyne, immediately opposite the Armstrong works, will cost about 90,000*l.* The whole of the machinery has been supplied by Messrs. Thomas Robinson & Son, of Rochdale.

Proposed New Church for Mossley, Lancashire. — The committee of the Old Mission Church at Micklehurst, Mossley, have decided to erect a new church, the plans of which have been sanctioned. The proposed building will be built in the thirteenth century style of Gothic architecture, and will accommodate about 300 persons. The choir and organ-chamber will be located on the east side, whilst the entrance will be towards the west, and the vestry will be placed on the basement on the south-west side. The edifice will be built of rubble and faced with plaster in the inside, and the outside will be dressed with local parpoints of Yorkshire stone. Messrs. Potts, Son, & Pickup, of Manchester, are the architects for the new church, and it is expected building operations will shortly commence.

Tate Free Library, Streatham.—On the 17th inst. a new free public library, which has been erected in the main street of Streatham, was formally handed to the parish authorities by its founder, Mr. Henry Tate. The building has been erected from plans prepared by Mr. Sydney J. R. Smith. It is externally faced with Portland stone. Internally it contains the following accommodation: A reading-room, 40 ft. by 25 ft.; a reference room, 30 ft. by 25 ft.; women's and committee-room; and a lending library, 47 ft. by 29 ft. There are in addition the necessary staff rooms, and a librarian's house. On the shelves there is space for about 25,000 books.

New Conventual School, Etterby, Cumberland.—On the 16th inst. the foundation stone of the new Convent of the Community of the Sacred Heart, on the Scaur, Etterby, was laid by the Rev. Canon Waterton. The cost of the building will be about 25,000*l.* The site covers something like seven acres, and cost 7,000*l.* Mr. Charles Walker, of Newcastle, is the architect; and Mr. James Metcalfe the contractor.

Parish Church, Waterloo, Liverpool.—The parish church of Waterloo, near Liverpool, is intended to be rebuilt from the designs of Messrs. R. E. Birkett & Langham, of Manchester, whose plans obtained the first place in a recent limited competition. It is, however, understood that the work of erecting the nave, aisles, and porches will be superintended by Messrs. Paley & Austin, architects, of Lancaster. It is hoped to proceed with the rebuilding at an early date.

Parochial Hall, Bootle.—On the 18th inst., Mrs. T. W. Cookson laid the memorial-stone of St. Leonard's Parochial Hall, to be erected at the north-east corner of Shakespeare-street and Cowper-street, Bootle. The new hall will contain, on the ground floor, a hall 60 ft. by 35 ft., and also several class-rooms. The first floor will be occupied by the lecture-hall, 76 ft. by 36 ft., a dressing-room, and another class-room. The principal entrance will be from Cowper-street. The building will be chiefly of red brick, with red sandstone dressings. Mr. George Bradbury, Surveyor to the diocese, prepared the designs, and Mr. James Holmes of Seaforth, is the contractor.

Chancel, St. Paul's Church, Stonehouse.—The new chancel which has just been added to St. Paul's Church, Stonehouse, from designs by Messrs. Hine & Odgers, architects, of Plymouth, was dedicated on the 17th inst. The dimensions of the chancel are: depth 30 ft., and width 19 ft., and there are on the north side vestries for clergy and choir, and on the south side an organ chamber. It is built of limestone, with Bath-stone dressings. The altar-rail and steps are of polished Plymouth marble, from Radford quarry. The three-light east window with new shafts of red and green Devonshire marble contains the glass of the old window. The roof is open timbered with Memel pine. The flooring is of encaustic tiles. By the alterations increased accommodation has been provided for about sixty persons. The work has been carried out by Mr. W. S. Sanders, contractor, of Plymouth. The carving has been done by Mr. Trevenen, of Stonehouse. The marble work was supplied by Messrs. Goad Bros., of Millbay, and the encaustic tile pavements were from the works of Messrs. Maw & Co., Shropshire.

Old Castle-street Synagogue.—Last week this synagogue was re-consecrated and re-opened. The synagogue was closed last year in consequence of the action taken by the Sanitary Committee of the Jewish Board of Guardians. The old building was pulled down and the present one erected upon the same site. The present building is 40 ft. in length and 30 ft. wide. There are seats for 235 persons, 120 being in the ladies' gallery. The building was erected at a cost of 1,100*l.* from the designs of Mr. Lewis Solomon, of 55, New Broad-street, by Messrs. Coulsell Bros., of Bonwell-street, Bethnal Green.

Masonic Hall, Paignton.—On the 15th inst. memorial-stones were laid of a new Masonic Hall, Paignton. The building is situated near Christ Church, the land having been given by Mr. G. S. Bridgman, the architect. The design is of the Renaissance style, of bunch-faced red rockstone, with Hamhill stone dressings. It has a frontage of 36 ft. The hall is 32 ft. by 21 ft., and is situated on the upper floor, with open timber roof. Adjoining the hall is a reception-room 20 ft. by 13 ft., and under the hall is a dining-room, kitchen, scullery, and offices. The contract is being carried out by Mr. Rabbick, of Paignton.

SANITARY AND ENGINEERING NEWS.

The Birmingham Water Scheme. — The Birmingham City Council on Tuesday last adopted, *nem. con.*, a proposal empowering the Water Committee to obtain plans and estimates of the scheme for securing a water supply from the Rivers Elan and Caerwen in Mid Wales, and to take steps to promote a Bill in Parliament in the Session of 1892. The cost of the scheme is estimated at 4,000,000*l.* to 6,000,000*l.*

The Sewage of Stockport.—On the 7th inst. Mr. Arnold Taylor, Local Government Board inspector, held an inquiry at Stockport into an application by the Corporation to borrow 17,600*l.* for the erection of sewage works on land at Cheadle Heath. The application was opposed on behalf of the trustees of the late Sir James Watts, who hold estates adjoining the proposed site, on the ground that it was a nuisance. Inquiry was also made

nto the application to borrow 15,000*l.* for street mprovements, against which there was no opposi- ion.

Oundle Waterworks and Sewerage.—A Local overnment Board Inquiry was held at Oundle on April 14, and presided over by Colonel Hasted, R.E. The Commissioners propose to borrow 4,800*l.* or waterworks, and 3,200*l.* for sewerage. Mr. V. H. Radford, C.E., explained the schemes. It as proposed to take the water from a well in the lluvial deposit and pump it into a reservoir to old 70,000 gallons. The quantity of water had een proved by extensive steam pumping, and the nalyses were satisfactory. It was proposed to eal with the sewage in chemical precipitation anks followed by filtration. The Inspector sug- ested that more land should be taken, and the ngineer arranged to revise the scheme accord- ngly. It is proposed to pump part of the sewage ith compressed air from the waterworks engine. here was no serious opposition to the schemes.

FOREIGN AND COLONIAL.

France.—The Archbishop of Paris has officially nformed all the bishops of France that the church f the Sacré Cœur on Montmartre will be opened in he month of June. The church is however in a ery incomplete state at present.——The muni- ipality of Joigny (Yonne) has opened a competition or the complete reconstruction of the communal ollege of that town.——A committee has been ormed to erect a monument to the composer illivier Métra in the cemetery at Bois le Roi. M. udovic Durand, the sculptor, has been commis- ioned to execute the monument, the model for hich is much admired.——On April 26 a monu- ent is to be inaugurated at Hyères to the memory f the sailors of the ships *l'Etat*, *l'Arrogante*, *Suffren*, *Fontebello* and *Louis XIV*. The monument, onstructed after the designs of the architects E. angeli and Ch. Maurel is to be in stone, 7 mètres height.——On August 30 there is to be opened Langres a competitive exhibition of painting, culpture, and architectural drawing; the designs ill be on view till the end of September.——On he occasion of the Local Congress of Depart- ents of the West of France there will be opened the town of St. Brieuc a fine art exhibition hich will open on June 10 and close on July 19. T—The town of Saint-Denis is also to open an rt and industrial exhibition; the opening is xed for May 3.——Part of the Château of ieffville, near Péronne, has been destroyed by fire. contained numerous objects of art of great alue.——A committee has been formed at arseilles to erect a monument in one of the public laces in the town to the memory of Lamartine. he monument, of which the plans are already pre- ared, will consist of a column in new Greek yle, surmounted by a bust of the poet. ——The district society of architects of the orth of France has decided that it will nd to all the architects of the department series of questions relative to the organisation of hools of architecture. The replies to the ques- ons will serve as the basis of a report which will be ddressed to the Minister of Public Instruction in gard to the conditions under which such schools n be usefully established in the Departments.—— he Municipality of Grenoble has voted 200,000 ancs towards the building of a School of Medicine f that town.——The Avenue de la Republique at aris, which is to lead from the Place of at name to pass behind Père Lachaise metery to the fortifications, is now laid out, and is expected that it will be inaugurated on July 14, e day of the National Fête.——M. Eugène arrière, the painter, opened an exhibition of his orks on the 19th, at MM. Boussod & Valadon's, oulevard Montmartre.——An exhibition of the aintngs of M. Auguste Flameng is also announced take place at the galleries of the Rue de la Paix. ——There has just been completed at Nice the new ipalais" for the promenade pier, constructed on e prolongation of the Promenades des Anglais, replace the old Casino burned some years o. It is constructed entirely in iron, and ilt on piles, under the direction of the chitect, M. Denise. It is connected with the wer by a bridge 30 mètres long.——The ten com- titors for the "Grand Prix de Peinture" have ceived from the Academie des Beaux Arts half e amount of the prize founded by M. Dubosc, id which is now given for the first time. The her half is to go to the ten competitors for the and "Prix de l'Architecture."——The death is nounced at Toulon, of M. Alfred Ledieu, corre- ondent of the Institut, former hydrographic gineer, well-known for important works in con- ction with navigation and steamships.——We ve to announce also the death of M. Buval, mer pupil of Constant Dufeux, President of the ciety of Architects of the Seine at Marne; also at of the painter Benoit Chancel, pupil of ndrin and father of M. Albert Chancel, archi- tural inspector to the Palais de l'Elysée.

Boston, U.S.A.—Mr. E. Wheelright has been pointed City Architect at Boston. The *Engineer- Record* (New York) regards the appointment one on which the city may be congratulated.

MISCELLANEOUS.

An Argyllshire Property for Sale.—Barcaldine Castle and Barony, Ardchattan, in the district of Lorne, will be offered for sale by public roup, at Edinburgh, on May 6 next. Covering 1,400 acres, and with a frontage of two miles by the sea, Barcaldine lies along the southern side of Loch Creran. The house, which is modern, and the four farms, yield a total rental of about 610*l.* a year; the upset price is fixed at 15,000*l.* In the immediate neighbourhood, near to Loch Etive, stood Vallicaulium Priory, founded in the thir- teenth century by Duncan Mackoul, ancestor of the Macdougals of Lorne, and in the loch is an island, named after Usnath, whose son carried off Dar- thula, wife of Conuhan, King of Ulster, as sung by Ossian. Ben Cruachan, rising to nearly 3,400 ft., stands on the remoter side of Loch Etive.

Forest Conservation in Australia.—The fol- lowing is from the new edition of the *Year-book of Australia*:—"South Australia was the first to take up the matter of the reservation of State lands for forest purposes. This was successfully brought about in the form of an Act by Mr. Krichauff, M.P., in the South Australian Legislative Assembly, in 1876. After several amendments in successive Parliaments, this measure is now known as the 'Woods and Forests Act of 1882,' under which some 200,000 acres have been set apart as Forest Reserves, of which there are about thirty-two in all. The Department formed under this Act has the Commissioner of Crown Lands as its political head, with a Conservator of Forests as the exe- cutive officer. There are seven nurseries under the Department, situated in different parts of the colony, for the purpose of raising the neces- sary young trees for planting purposes. The imme- diate staff consists of four foresters, seven nursery- men, fifteen cadet foresters, and forty permanent labourers. During the planting season from 100 to 200 extra men are employed. In consequence of the small extent of indigenous forest lands now in the hands of the Government, the operations of the Depart- ment have been largely devoted to the planting of land upon which trees have never grown before. This work has been very successful in all parts of the colony, although carried out in sites com- prising various soils, situations, and aspects, and ranging in elevations above the sea of from 50 ft. to 2,000 ft., and with annual rainfalls of from 9 in. to 30 in. The principal trees grown have been the more valuable Eucalypti, together with a consider- able variety of those exotic trees which produce the principal timbers of commerce. Up to date, some 5,000,000 of trees have been successfully established upon 10,000 acres of hitherto non-tree-producing lands. Besides this, over 2,000,000 of trees have been given away gratis to farmers, corporations, and other landholders, over the colony, with very satisfactory results. Perhaps, however, the most satisfactory feature of this Forest Department lies in the fact that, notwithstanding the cost of the immense permanent improvements effected by it in the way of planting, buildings, &c., and which is estimated at 250,000*l.*, its revenue has exceeded the expenditure by about 9,000*l.* The Nurseries are now capable of raising 2,000,000 of trees annually. The expenditure of the Department is about 7,500*l.* per annum, which is voted by Parlia- ment as part of the General Estimates. The revenue fluctuates from 8,000*l.* to 12,000*l.* Vic- toria has recently begun Forest Conservancy upon very commendable lines, and has already reserved over 4,000,000 of acres for that purpose."

The Alexandra Palace and Grounds.—Mr. H. R. Williams writes:—"The Bill promoted by the London Financial Association for repealing the protective clauses of the Muswell-hill Estate Act, 1866, and the Alexandra Palace Act, 1877, has been withdrawn. The Alexandra Palace and Park are consequently safe at present from the exercise of the builder's art. I have every reason to believe that negotiations will be at once set on foot to secure this unrivalled park for the use and the recreation of the public in perpetuity. London cannot afford to lose the Alexandra Park; it is too important a lung to be dispensed with."

LEGAL.

Hart v. Hems.—A case of some interest to exhibitors has just been tried at the Westminster County-court, when Mr. John Hart, the promoter of the Ecclesiastical Art Exhibitions at the Annual Church Congresses, sued Mr. Harry Hems, of Exeter, for 4*l.* 4*s.*, charges made for space re- served for, but not used by, defendant at the Exhibition held at Hull last September. The plaintiff was represented by Mr. Collier, whilst Mr. A. H. Crickmay defended. — The case of the prosecutor was that, in response to his application in June, Mr. Hems agreed to exhibit, but that he had failed to do so, and, therefore, the claim for space reserved. The defence was that, although it was admitted that early in June Mr. Hems had consented to exhibit, he did not then know the precise date of the proposed exhibition; that to plaintiff's knowledge he (defendant) left for the United States the same day the arrangement took place, and that he heard no more of the matter until the day after the opening of the Exhibition,—over three months later,—when he had a telegram from Mr. Hart apprising him of the fact, it being then too late to send.—Defendant claimed non- liability on the score of plaintiff's neglect to notify him in due time of the intended opening.—His Honour held that it was defendant's duty to find out for himself when the Exhibition actually did take place, and notwithstanding Mr. Crickmay's arguments, gave judgment for the plaintiff with costs.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

4,702.—Steel Plate or Joist: *J. Mayoh.*—This invention refers to a bar of steel or iron corrugated in cross section. These corrugations need not be of any particular pitch, size, or shape; but the pitch is regulated by the depth of the bar or joist. It is designed as an improvement upon the ordinary H section of steel or iron bars as used for joists, and is found to possess great strength.

7,365.—Clamp or Vice: *C. R. Bonne.*—This specifi- cation refers to a simple device for a clamp or vice with a fixed jaw and a movable jaw and bar operated by a screw spindle.

7,636.—Exit for Theatres: *R. Resuche and another.* —According to this invention, doorways are formed in walls with shutters opened automatically, or by means of a weight and chain. These doors lead direct on to staircases, and thence to the outside of the building.

9,151.—Hinges: *Wm. Reynolds.*—According to this invention, the hinge for gates is formed (to prevent drooping) of a piece of metal, shaped so that when fixed to the side of a gate it forms a square frame. From the eye of the hinge is formed a flat bar, on the end of which is a screw passing through a flat plate which forms a slide in the square frame. A long screw is inserted in the side of the frame, which forces against the slide and lifts the gate to the position required.

9,305.—Door-spring: *C. W. Thode.*—This specifica- tion relates to an improved door-spring for swing-doors, whereby greater length of spring is obtained and less liability of breakage than with other springs of the kind. The spring is of the spiral form, and is coiled about a guide-rod curved concentrically with the pivotal axis of the door, and is confined between abutments, by which the guide-rod is held. Upon this rod arms play, carried by a socket working on a pivot in a spring box and turning in the door, the arms bearing against the opposite ends of the spring. When the door is swung in one direction, the one arm bears against the one end of the spring, whose abutment is, for the time being, at the opposite end, and *vice-versâ*, when the door is swung in the opposite direction.

1,273.—Glazing Bars: *Geo. Martin.* — The bar which is the subject of this patent is of peculiar shape, L, the glass resting on the serifs of the letter and the top forming ducts or troughs, to carry away the moisture. Stop plates and pegs are used to fasten the glass.

2,313.—Draught-excluders: *J. F. Golding.*—Accord- ing to this invention, a strip of wood is adjusted to the bottom of the door, and caused to fall down when the door is closed by the action of a spring and catch.

NEW APPLICATIONS FOR PATENTS.

April 6.—5,866, W. Thompson, Tieing or Holding together Door Frames, Window-sashes, &c.—5,890, W. Trowsdale and J. Thompson, Bolt for Lavatory Doors, &c.

April 7.—5,928, W. & T. Fox, Saw Bows or Frames.— 5,935, E. Devis, Casting Pipes, Columns, Girders, &c.— 5,945, J. McNaughton, Water-closet Cisterns.—5,948, E. Hutchins, Sills of Windows or Doors for Buildings.— 5,954, C. Rogers, Wood Screws.—5,962, H. Moir, Rever- sible Seats.—5,985, J. Reap, Wood-cutting Tool.—5,988, J. Mason and others, Tread for Floors, Stairs, &c.— 6,001, S. Day, Gutters.—6,002, E. Edwards, Iron Heating Pipes.

April 8.—6,011, A. Lundberg, Ceiling Roses for Elec- tric Lighting.—6,018, C. Henshaw, Ventilation.—6,023, D. Smith, Automatic Flushing of Water-closets.—6,039, R. Scholefield, Machines for Moulding and Pressing Bricks.—6,041, J. Craven, Kilns for Drying and Burning Bricks.

April 9.—6,083, G. Priest, Drain-valve and Stench-trap. —6,091, C. Horton, Cottage Water-closets.—6,116, C. Murrell, Excluding Draughts from Doors, Window- sashes, &c.—6,118, H. Warrington, Kilns or Ovens for Bricks, &c.—6,131, G. Hope, Winning or Getting Gravel, Sand, &c.

April 10.—6,156, W. Herbert, Window Fastenings.— 6,182, E. Wehrli and E. Bally, Parquetry Floors, &c.— 6,188, J. Drayton and J. Wilkins, Window Wedge.

April 11.—6,227, T. Potter, Fire-resisting Floors.— 6,244, R. Hepburn, Roofs, Walls, and other Parts of Buildings and Slabs, Sheets and Tiles for same.

PROVISIONAL SPECIFICATIONS ACCEPTED.

1,936, J. Wild, Gulley and Flusher for Sewerage and Closets.—3,195, F. Williamson, Ventilators for Cowls.— 4,509, A. Mitchell-Jones, Rose-bits and similar Boring Tools.—4,610, F. Plant, Ovens, Kilns, &c.—4,635, J. Chaffer, Securing Sashes, &c., when opened or closed.— 4,665, D. Tuly, Hinges.—4,933, F. Smith and J. Corbett, Iron Casements or Frames.—4,997, J. Bennett, Improved System of Roof-tiling.—5,023, W. Horn, Ventilating and Heating the Walls of Buildings.—5,227, A. Green, Open- ing or Shutting Skylights, &c.—5,265, A. Prentice, Window Sashes and their Frames, applicable also to Doors, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

5,572, W. Millington, Tubular Boiler for Fireplaces or Stoves.—6,950, M. Rodgers, Ventilators.—7,360, G. Evans, Fixing Sash Cords or Wires or Bands to Sliding Window Sashes and Sash Weights without removing Sash or any particle of wood.—9,066, T. Turner, Ba- lancing Window Sashes.—9,093, S. Baxter, Attaching Sash Cords to the Sashes of Sliding Windows.—4,296, W. Kelleher, Show Case and Shop Partition, &c.—4,364, A. Boult, Carving or Cutting Machines.—4,333, L. Campion, Moulding Apparatus for Filling with Molten Lead Incised Letters or Ornamentation in Marble, &c.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Public Baths and Washhouses, Islington	Commrs. for Public Baths & Washhouses	50*l*, 20*l*, and 10*l* Gs.	May 30
*Water Supply	Rugeley Local Board	.....	May 31

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Swedish Firewood	City of London Union	*Official*	April 27
Filter, Sewage Works, Knutsford	Altrincham U.R.S.A.	J. McKenzie	April 28
Sewering, Excavating, &c.	Runcorn Impt. Com.	*Official*	do.
*Roadmaking and Paving Works	Willesden Local Board	O. Claude Robson	do.
Farm Buildings, Asenby, near Thirsk	.....	Geo. Mallinson	do.
Stables, Coachhouse, Entrance Lodge, &c. Catnarton, Charmouth, Dorset	Major Bullen	F. Cooper	do.
Schools, Outbuildings, &c. the "Falls"	East Ardsley Sch. Bd.	J. Lane Fox	April 29
Additions, &c. Crwys Hotel, Cathays	.....	J. P. Jones	do.
Additions to Old Academy, Elgin	.....	A. & W. Reid	do.
Road Materials	Sale Local Board	A. G. McBeath	do.
Sinking a Shaft, Stonecroft and Greysides Roads and Sewers, Easton, Bristol	Wm. Lee	.....	do.
Farm Buildings, &c Carrington	.....	A. Barratt	do.
Altering Registrar's House, Cemetery, Toxteth Park	Manchester Corp.	*Official*	do.
Shop and Three Cottages, Murton, Durham	Burial Board	T. H. W. Walker	do.
*Supply of Kerb and Channel Stone	Murton Colliery Co-op. Soc. Lim.	*Official*	do.
Street Formation, Booth Town, Halifax	Folkestone Corp.	A. W. Conquest	do.
Dwelling-house, Rhodes-street, Halifax	.....	Geo. Buckley & Son	April 30
New Branch Stores, Pelaw, co. Durham	.....	Arthur Shoesmith	do.
Flags, Kerbs, Setts, Macadam, &c.	Boldon Indus. Co-op. Soc. Lim.	*Official*	do.
Police Station, Headingley	Widnes Local Board	do.	do.
Eleven Houses, and Alterations to Buildings, Currock-street, Carlisle	Leeds Corporation	do.	do.
Station Buildings, Bingley	Messrs. Iredale	H. Higginson	do.
Swimming Bath at Workhouse	M. R. Co.	*Official*	May 1
Railway (2¼ miles), Winlaton, Durham	Newcastle-upon-Tyne Guardians	W. H. Dunn	do.
Waterworks	Consett Iron Co. Lim.	Hubert Laws	do.
Additions to Club House, Portrush, Irel.	Grangemouth (N.B.) Police Commrs.	A. & W. Black	do.
*Additional Offices for Engineers' Department, Derby	County Golf Club	Henry Seaver	do.
*Police Superintendent's House and Lock-up, Bridgnorth	M. R. Co.	*Official*	do.
*Supply of Creosote Oil	Standing Joint Com.	A. T. Davis	May 2
House and Premises, Pontnewynydd, near Pontypool	Norwich Corporation	P. P. Marshall	do.
Twenty Houses, Treorchy, nr. Pontypridd	Trevethin School Bd.	E. A. Lansdowne	do.
Fifty Houses, Abergwynn, nr. Pontypridd	Ynysywen Build Club Building Company	A. O. Evans	do.
*Construction of Pipe Sewer, &c.	Hendon U.R.S.A.	do.	do.
*Painting, Repairs, &c.	City of London Union	*Official*	May 4
Fencing, Paving, Flagging, &c.	Wibhington Local Bd.	A. H. Mountain	do.
Drainage Works, Malling-terrace	Maidstone U.S.A.	W. G. Scoones	do.
Piling River Bank	do.	do.	do.
Porches, &c. Four Houses, Claremont-buildings, Shrewsbury	.....	W. C. Eddowes	do.
*Construction of Mortuary	Bermondsey Vestry	*Official*	do.
*Warehouse, &c.	.....	H. W. Chattaway	do.
*Hot-water Fittings, Colney Hatch	London County Asylum Committee	*Official*	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Making-up Private Streets	Richmond (Surrey) Town Council	W. Brooke	May 5
*Alteration and Extension of School	Burton-on-Trent Sch. B.	R. Churchill	do.
*Hoardings, &c.	London County Council	*Official*	do.
Alterations to Corn Exchange	Lewes Town Council	S. Denman	do.
*Sewerage and Road Works	Leicester Corporation	*Official*	do.
*Gasholder Tank	Newcastle-on-Tyne & Gateshead Gas Co.	do.	do.
Re-building Stone Piers and Wall, &c. at Cemetery	St. John, Westgate, and Elswick United Burial Board	.....	do.
*Tarring and Sanding Sea Wall	Hove Commrs.	Stockwell & Spicer	do.
Cattle and Keet Houses, Implement Shed, &c. Gerston, Totnes	Duke of Somerset	*Official*	May 5
Bailiff's House, Cottage, and Stables, Wateringhury Farm, Hursworth Castle	Viscountess Falmouth	Michelmore & Son	do.
Sewerage Works	Ogmore and Garw Local Board	.....	May 9
*Retort House and Coal Store	Romford Gas and Coke Co. Lim.	H. Dawkin Williams	May 16
*Pulling-down Old Building and Erecting New Dining Hall, &c.	Romford Union	*Official*	May 11
*Wrought-iron Bridge and Approaches, Lewisham	London County Council	F. Whitmore	do.
*New School	Swindon School Board	*Official*	May 12
*Precipitation Tanks (Main Drainage Scheme)	Manchester Corp	W. Drew	May 15
*New Workhouse Buildings	Hastings Union	J. Allison	May 19
Excavating for Twelve Houses, Leeds	.....	F. H. Tree	May 21
Wesleyan Methodist Chapel, Hunslet, Leeds	.....	C. F. Wilkinson	No date
Vil'a and Stone-room, Aberaman	M. I. Jones	Thos. Howdill	do.
Church, Camerton, Workington (Contract No. 2)	.....	.....	do.
House, Stanhope-street, Abergavenny	B. C. Morris	Geo. Dale Oliver	do.
Shops, Dwelling-houses, &c.	Chester-le-Street Co-op. & Indus. Soc. Lim.	.....	do.
Re-building Public House	.....	S. Oswald & Son	do.
Farmhouse, Coaley, Gloucestershire	J. Peter	H. J. Newton	do.
Post-office, Hyde, Manchester	The Postmaster	B. E. Fansford	do.
Thirteen Houses, Dunmurry, Ireland	Thos. Crawford	.....	do.
Police Station, Towcester	Northampton C. C.	Jas. Ewar	do.
Restoration of Transepts, Wimborn Minster	.....	Mr. Law	do.
Block of Semi-detached Villas, Lightcliffe, Halifax	.....	J. S. Pearson	do.
Drainage Works	Hipperholme (Yorks) Local Board	J. F. Walsh	do.
New Shops, &c. Green Bridge, Stafford	.....	*Official*	do.
Three Houses, &c. Liverpool-road, Kidsgrove	.....	John F. Bridgwood	do.
House and Stabling at Stoke, Staffs.	F. C. Wade	Edwin Penn	do.
	Dr. W. W. Hind	R. Scrivener & Sons	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Inspector of Nuisances	Borough of Colchester U.S.A.	100*l*.	April 27
Assistant Road Surveyor	Durham and Chester-le-Street High. Bd.	100*l*.	April 30
Engineer	Portsmouth Waterwks Co	3*l*. 5*s* per week	No date

Those marked with an Asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv, *and* vi. *Public Appointments, p.* xxii.

MEETINGS.

SATURDAY, APRIL 25.

Architectural Association.—Visit to the Weigh House Chapel, Duke-street, Grosvenor-square.

Royal Institution.—Professor Silvanus P. Thompson on "The Dynamo." III. 3 p.m.

MONDAY, APRIL 27.

Society of Arts (Cantor Lectures).—Mr. Hugh Stannus on "The Decorative Treatment of Natural Foliage." III. 8 p.m.

Leeds and Yorkshire Architectural Society.—(1) Presentation of Annual Report. (2) Election of officers. 7.30 p.m.

TUESDAY, APRIL 28.

Institution of Civil Engineers.—Further discussion on Mr. R. E. B. Crompton's paper on "The Cost of the Generation and Distribution of Electrical Energy." 8 p.m.

Birmingham Architectural Association.—7.30 p.m.

WEDNESDAY, APRIL 29.

The Hospitals Association (Guy's Hospital).—(1) Dr. Steele on "Hospital Ventilation, with an account of the Victoria Infirmary at Glasgow." (2) Mr. Saxon Snell on "An Inquiry into the Structural Arrangements of the Nursing Departments of Hospitals." 8 p.m.

Institution of Mechanical Engineers.—Anniversary dinner.

Civil and Mechanical Engineers' Society. — General Meeting for the Presentation of Report, Election of Council, &c. 7 p.m.

Society of Arts.—Professor W. Robinson on "The Use of Petroleum in Prime Motors." 8 p.m.

THURSDAY, APRIL 30.

Institution of Mechanical Engineers. — Ordinary General Meeting, when two papers will be read. 7 30 p.m.

Institution of Civil Engineers.—Students' visits to the Printing establishment of Messrs. William Clowes & Sons, Duke-street, Stamford-street, S.E., and the printing-works of the *Graphic*, 190, Strand.

Society of Arts (Indian Section).—Colonel J. O Hasted, R.E., on "The Ferrier Irrigation Project, Madras Presidency." 4.30 p.m.

Society of Antiquaries.—8 30 p.m.

Edinburgh Architectural Association. — Paper by Mr. John M'Lachlan. 8 p.m.

FRIDAY, MAY 1.

Institution of Mechanical Engineers. — Ordinary Meeting (continued). 7.30 p.m.

Royal Institution.—Annual Meeting. 5 p.m.

SATURDAY, MAY 2.

Association of Public Sanitary Inspectors.—Dr. B. W. Richardson, President, on "National Main Drainage." 6 p.m.

Junior Engineering Society.—Visit to Tower Bridge Works. 3 30 p.m.

Royal Institution.—Professor Silvanus P. Thompson on "The Dynamo." IV. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 13.—By *A. Booth:* No. 237, Camden-rd., u.t. 55 yrs., g.r. 16*l*., r. 100*l*., 950*l*.; 55, Hilldrop-cres., u.t. 53 yrs., g.r. 8*l*., 490*l*.—By *Weston & Son:* 41, Lothian-rd., Camberwell, f., 455*l*.; 7, The Grove, Clapham-rd., u.t. 50 yrs., g.r. 8*l*. 8*s*., 515*l*.; 23 and 25, Canterbury-rd., Brixton, u.t. 70 yrs., g.r. 17*l*. 8*s*., r. 100*l*., and a l.g.r. of 5*l*. 10*s*., u.t. 70 yrs., 930*l*.

APRIL 14.—By *Fenton, Bull, & Cooper:* 4, Garlinge-rd., Brondesbury, u.t. 83 yrs., g.r. 8*l*., 850*l*.—By *V. Robinson:* Elm-rd., Leytonstone, three plots of freehold land, 110*l*.—By *Fazebrother, Ellis, & Co.:* 56, St. James's-st, Piccadilly, f., 304*l*. 4*s*., 8,450*l*.; 11, West Smithfield, City of London, f., r. 180*l*., 3,520*l*.—By *Rogers, Chapman, & Co.:* 10, Cromwell-cres., Kensington, u.t. 77 yrs., g.r. 5*l*., 1,030*l*.; 8, Clareville-grove, u.t. 28 yrs., g.r. 5*l*., r. 60*l*., 870*l*.; 5, Gunter-grove, West Brompton, u.t. 63 yrs., g.r. 5*l*., 485*l*.; 21, Park-walk, Chelsea, u.t. 16 yrs., g.r. 4*l*. 16*s*., r. 42*l*., 220*l*.; 23, Limerston-st., u.t. 58 yrs., g.r. 4*l*. 2*s*., 515*l*.; 156 and 158, Beresford-rd., Walworth, u.t. 16 yrs, g.r. 6*l*. 6*s*., r. 30*l*., 200*l*.; 193 to 201 (odd), Beresford-rd., u.t. 16 yrs., g.r. 17*l*. 10*s*., r. 91*l*. 5*s*., 626*l*.

April 15.—*By Flood & Sons:* 16, Errington-rd, Paddington, u.t. 72 yrs., g.r. 6*l*. 10*s*., r. 45*l*., 405*l*. *By Inman Sharp, Harrington & Roberts:* 23 to 29 (odd), Boston-st., Hackney, f., 395*l*.; 90, London-rd., Forest-hill, u.t. 40 yrs., g.r. 6*l*. 10*s*., r., 50*l*., 440*l*. *By H. Donaldson:* 7, 8, and 9, Hatton-yard, Holborn, f., r. 80*l*., 1,300*l*.; 62 and 64, Giff-rd-st., Islington, u.t. 59 yrs., g.r. 15*l*., r. 81*l*. 18*s*., 435*l*.; 60, Gifford-st., and stabling, u.t. 59 yrs., g.r. 7*l*. 10*s*., 520*l*.

APRIL 16.—By *A. G. Thomson & Co.:* 8 to 14 (even), Charlwood-pl., Pimlico, u.t. 35 yrs., g.r. 32*l*., r. 228*l*., 2,100*l*.; 15, Cornwall-st., Belgravia, u.t. 42 yrs., g.r. 9*l*., r. 55*l*., 570*l*.—By *H. J. Bromley:* 27 and 29, Hanover-st., Sydenham, u.t. 40 yrs., g.r. 7*l*. 3*s*. 4*d*., 320*l*.; 1 and 2, Lime Tree-villas, Dulwich, f., 655*l*.; 4, Lime Tree-villas, f., 450*l*.—By *H. J. Bliss & Sons:* 83, Disraeli-rd., West Ham, f., 200*l*.; 36, Carlton Vale, Kilburn, u.t. 57 yrs., g.r. 10*l*., 440*l*.—By *Bell & Beazley:* 9 to 15 (odd), Inver-rd., Clapton, u.t. 88 yrs., g.r. 20*l*., 740*l*.—By *Newbon & Co.:* 2, Everildas-st., Barnsbury, u.t. 52 yrs., g.r. 2*l* 12*s*., r. 30*l*., 315*l*.; 18, 26, and 28, All Saints st., Islington, u.t. 54 yrs., g.r. 18*l*., r. 100*l*., 875*l*.; 1, Holford-sq., Pentonville, u.t. 27 yrs., g.r. 5*l*., 630*l*.; 29 to 32, Clinger-st., Hoxton, u.t. 12 yrs., g.r. 6*l*., r. 62*l*. 4*s*., and a g.r. of 6*l*., u.t. 12 yrs., 180*l*.; 38, Whitmore-rd., u.t. 27 yrs., g.r. 3*l* 10*s*., r. 31*l*. 4*s*., 150*l*.; 35, Hows-st., Kingsland, u.t. 28 yrs., g.r. 9*l*. 10*s*., r. 30*l*. 6*s*., 110*l*.; Nos 200 and 204, Clapham-rd., u.t. 11 yrs., g.r. 25*l*. 4*s*., r. 113*l*., 510*l*.; 1 to 11, Portland-pl., u.t. 11 yrs., g.r. 30*l*., r. 179*l*., 660*l*.—By *W. Hall:* 1, Lindfield-gardens, Hampstead, f., 4,450*l*.; 3, Lindfield-gardens, f., r. 275*l*., 4,650*l*.; 73, Theobald's-rd., Holborn, u.t. 70 yrs., g.r. 40*l*., r. 120*l*., 1,105*l*.—By *Herring, Son, & Daw:* "The Hermitage," Christchurch-rd., Streatham Hill, f., 1,700*l*.—By *C. C. & T. Moore:* 305, Mile End-rd., Mile End, u.t. 66 yrs, g.r. 7*l*., r. 53*l*., 600*l*.; 10 and 12, Bancroft-rd., u.t. 66 yrs., g.r. 8*l*. 10*s*., r. 72*l*., 800*l*.; 38 and 40, St. Dunstan's-rd., u.t. 49 yrs., g.r. 9*l*., r. 52*l*., 300*l*.; 55, 61, and 63, Bloomfield-rd., u.t. 76 yrs., g.r. 15*l*., r. 105*l*. 6*s*., 755*l*.; 18 to 28 (even), Burgess-st Limehouse u.t. 72 yrs., g.r. 21*l*., 1,135*l*.; 41 and 43, Copenhagen-pl., u.t. 49 yrs., g.r. 6*l*., r. 52*l*., 325*l*.; 2 and 3, Taylor's pl., u.t. 32 yrs., g.r. 5*l*., r. 46*l*. 16*s*., 200*l*.; "The Barley Mow" P. H., Baker's-row, Whitechapel, f., r. 30*l*., 450*l*.; 61 to 69 (odd), Baker's-row, f., 1,180*l*.; 140, Buxton-st., f., r. 27*l*. 6*s*., 260*l*.; 91, 93, and 95, Underwood-st., f., r. 57*l*. 4*s*., 400*l*.; 9 and 10, Periwinkle-st., 2, Cross-st., and 1 to 7, Onren's-sq., Ratcliff, f., 520*l*.; 19 to 27 (odd), Ireton-st., Bow, u.t. 83 yrs., g.r. 15*l*., 460*l*.; l.g.r. of 33*l*., Carr-st., Limehouse, u.t. 35 yrs., 420*l*.

APRIL 17.—By *Humbert, Son, & Flint:* 8, Ridgway-pl., Wimbledon, u.t. 60 yrs., g.r. 8*l*., 1,390*l*.; 2 to 9, Queen's-rd., Battersea, u.t. 72 yrs., g.r. 64*l*., 2,400*l*.; 10, 11, 16 to 19, Queen's-rd., u.t. 72 yrs., g.r. 48*l*., r. 221*l*. 10*s*., 1,730*l*.; 20, Queen's-rd., u.t. 72 yrs., g.r. 8*l*., r. 42*l*., 410*l*. By *J. C. Platt:* "Dundee Villa, Brandenburgh-rd., Gunnersbury, u.t. 82 yrs., g.r. 7*l*. 10*s*., 510*l*.; f.g.r. of 93*l*., with reversion in 75 yrs., Selhurst New-rd., Croydon, 1,790*l*.; f.g.r. of 54*l*., with reversion in 75 yrs., Gloucester-rd., 1,145*l*.—By *Reynolds & Eason:* 87, Lauriston-rd., Hackney, u.t. 60 yrs., g.r. 7*l*., r. 50*l*., 405*l*.; 4, Shore-rd., u.t. 51 yrs., g.r. 10*l*., 450*l*.; 3 and 4, Lamb's-ter. North, f., r. 64*l*. 16*s*., 830*l*.; 1 to 6, Cliff-rd., Croydon, u.t. 999 yrs., g.r. 6*l*., r. 78*l*., 550*l*.; 38, 40, and 42, Ford-st., Old Ford, f., r. 73*l*., 720*l*.; "Bury Lodge," Bury-lane, Epping, f., r. 45*l*., 660*l*.; 29, Lightfoot-rd., Hornsey, f., r. 38*l*., 515*l*.—By *Baker & Sons:* 24 and 25, Pitt's-pl., Southwark, f., 310*l*.; 30a, Fulham-rd., Fulham, u.t. 67 yrs., g.r. 30*l*. 10*s*., r. 130*l*., 735*l*.; 51, Cadogan-st., Chelsea, u.t. 52 yrs., g.r. 8*l*., r. 50*l*., 720*l*.; 1, Elm-park-ter., Kensington, u.t. 83 yrs., g.r. 20*l*., r. 131*l*. 6*s*., 1,000*l*.

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

EXHIBITION OF PAINTER-STAINERS' WORK.—A Painter-Stainers' Hall, Little Trinity-lane, on th 17th inst., an art exhibition, embracing the various branches of the painter-stainers' trade, was opene under the patronage of the Painter-Stainers' Com pany. The exhibition (according to the *City Pres* is more particularly confined to apprentices an improvers' work, and comprises specimens of grain ing, marbling, designing, lettering, and painting The judges included the Master of the Painte Stainers' Company (Mr. W. Lutwyche), Mr. Harr Heal (the Upper Warden), Mr. W. Hawtrey, C.C (Renter Warden), and the following members of th Court of Assistants: Mr. J. D. Crace, Mr. W. F Cloake, Mr. J. H. Donaldson, and Mr. Cowtan. M H. D. Pritchard and Mr. W. T. Englefield, as joi clerks to the Company, rendered assistance in th arrangement of the exhibits. The exhibitio which is the fourth of its kind that has been hel under the patronage of the Painter-Stainers' Com pany, will remain open until the 27th inst.

PRICES CURRENT OF MATERIALS.

TIMBER.

eenheart, R.G.		
ton	6/10/0	7/15/0
k, E.I.. load	8/10/0	14/0/0
pania, U.S.ft.cn.	2/3	3/0
h, Canada load	2/10/0	4/5/0
ch, do.	2/5/0	4/3/0
a, do.	3/10/0	4/15/0
k, Dantzic, &c.	2/0/0	3/15/0
k, do.	2/10/0	4/10/0
Canada..	4/7/6	6/10/0
k, Canada red	2/10/0	3/10/0
do, yellow	2/0/0	5/10/0
h, Dantzic, fath	5/0/0	6/0/0
it. Petersburg	6/0/0	7/0/0
als, Finland,		
nd & 1st std 100	7/0/0	10/0/0
do, 4th & 3rd ..	7/0/0	8/0/0
do. Riga	6/0/0	7/10/0
it. Petersburg,		
1st yellow ..	9/10/0	14/0/0
do. 2nd yellow	8/0/0	9/0/0
do. white	6/10/0	10/0/0
Swedish	6/10/0	15/0/0
White Sea	8/0/0	16/10/0
Canada, Pine 1st	13/0/0	24/0/0
do. do. 2nd..	9/0/0	15/10/0
do. do 3rd, &c.	6/10/0	10/0/0
Do. Spruce. 1st	8/10/0	10/10/0
do. do. 3rd &		
2nd	6/0/0	7/10/0
New Brunswick	5/0/0	7/0/0
ttens, all kinds	3/10/0	15/10/0
oring Boards,		
1in. prep.		
..st	0/10/0	0/14/0
..2nd	0/9/0	0/10/0
ther qualities	0/5/0	0/7/6
lar, Cuba ..ft.	/4	/4½
Honduras, &c.	/4	/4½
hogany, Cuba,	/4½	/6½
t. Domingo,		
cargo av	/4½	/6½
Mexican do. do	/4½	/5½
bbacco do. do	/5½	/7
Honduras do..	/5½	/6½
.. Turkey ton	4/0/0	13/0/0
.. Rio.....	10/0/0	20/0/0
ahia	9/0/0	18/0/0

TIMBER (*continued*).

Satin, St. Do-		
mingo .....ft.	0/0/10	0/1/3
Porto Rico	0/0/10	0/1/8
Walnut, Italian..	0/0/3½	0/0/7

METALS.

IRON—Bar, Welsh,		
in London .ton	6/5/0	6/15/0
Do. do. at works		
in Wales	5/15/0	6/5/0
Do. Staffordshire,		
in London	6/5/0	7/0/0
COPPER — British		
cake and ingot	56/0/0	57/0/0
Best selected ..	59/0/0	60/0/0
Sheets, strong..	68/0/0	0/0/0
Chili, bars	52/10/0	0/0/0
YELLOW METALft.	0/0/6	0/0/6½
LEAD — Pig,		
Spanish ....ton	12/2/6	0/0/0
English, com.		
brands	12/10/0	12/12/6
Sheet, English,		
3 lbs. per sq. ft.		
and upwards ..	14/5/0	0/0/0
Pipe	14/15/0	0/0/0
ZINC — English		
sheet ..... ton	26/5/0	0/0/0
Vieille Mon-		
tagne.....	26/15/0	0/0/0
TIN—Straits	90/10/0	0/0/0
Australian	90/15/0	0/0/0
English Ingots	94/10/0	0/0/0

OILS.

Linseed .....ton	21/15/0	22/2/6
Cocoanut	35/10/0	36/0/0
Do. Ceylon	29/10/0	30/0/0
Palm, Lagos	26/0/0	0/0/0
Rapeseed, English		
pale	30/10/0	0/0/0
Do. brown	29/0/0	0/0/0
Cottonseed ref...	21/10/0	0/0/0
Olcine	21/15/0	24/0/0
Lubricating, U.S.	6/0/0	7/0/0
Do. refined	7/10/0	12/0/0
TAR — Stockholm		
barrel	1/1/6	1/2/0
Archangel	0/13/6	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ASTON MANOR.—For sinking an artesian well for the Local Board. Mr. W. Augustus Davies, engineer, Aston Manor. Quantities supplied:—
Joseph North, Aston Manor (accepted on schedules of prices).

HANSTEAD (Surrey).—For additions, alterations, and repairs to "Lowlands," for Mr. Robertson Rodger. Mr. Frederick Ledger, architect, 3, Lombard-court, E.C.:—

Humphris £1,690	W. Taylor £1,247
Potter 1,620	J. Smith & Sons 1,185
Bowyer..... 1,300	J. Greenwood & Sons,
dward & Co..... 1,223	London (accepted) . . . 1,150
Night-ngale 1,150	

BATH.—For the erection of schools on land near the Bristol-road, for the School Board. Mr. W. J. Willcox, architect, 1, Belmont, Bath:—

Tibley £3,198	Long & Sons, Bath* £2,444
ward & Wooster 2,696	E. Chancellor 2,182
Wilkins & Sons 2,536	* Accepted.

BEDFORD.—For additions to Trinity School, Roise-street, Bedford. Mr. Jas. Hull, architect, St. Paul's-square, Bedford:—

Hayes & Sons..... £679	T. Laughton £574
ay & Son 677	S. Foster 575
ombe Bros. 673	T. H. Coleman 574
arton 649	C. E. Fathers 549
slack..... 616	John P. White, Bedford* .. 539
	* Accepted.

BELFAST.—For roads and sewers in Ashley Park, for Mr. Edward Dworthy. Mr. John Lanyon, engineer:—
Workman, Green, & Co., Belfast (accepted) £772 6 0

BELVEDERE (Kent).—For the erection of a house, Kentish-road, Belvedere, for Mr. W. E. Sister. Mr. Frederick J. Sister, architect, Bowlas-street, Camberwell:—
Geo. Bleeze (accepted)..... £250 0 0
[No competition.]

BRADFORD (Yorks).—Accepted for alterations and additions to Highfield, Horsforth. Messrs. Fairbank & Wall, architects, Crayven Bank-chambers, Bradford, Yorks:—
Mason—Wintersburn & Thackwray, Leeds £380 0 0
Joiner.—W. G. Bogg, Bradford 163 5 0
Plumbers.—H. Braithwaite & Co., Leeds 143 0 0
Plasterer.—J. Lacman, Bramley, near Leeds 46 10 0
Slaters.—Thornton Bros., Otley..... 16 15 0
Painters.—E. Harland & Sons, Rawdon, near Leeds..... 17 0 0

BROADSTAIRS.—For alterations and additions to the "Albion" Hotel, for Mr. E. A. Villiers. Messrs. Langham & Cole, architects, Broadstairs:—
Peto Bros., Pimlico (accepted)..... £724

BROADSTAIRS.—For new stabling, &c., St. Peter's-park, for Mr. R. M. Richford. Messrs. Langham & Cole, architects, Broadstairs:—
Newby..... £314
T. May, Broadstairs (accepted) £309

CARDIFF.—For alterations to premises, Queen-street, for Dr. Edwards. Mr. Jno. P. Jones, architect, 27, Park street, Cardiff:—
Waterman £1,180 0 0
Griffiths 1,026 0 0
Bros. 940 0 0
herd & Son 914 0 0
Josey 897 10 0
ker & Sons 888 0 0

Thos. Gough.....	£893 0 0
Joseph Thomas ...	861 0 0
Henry Davies	848 0 0
Burton & Co.	836 0 0
G. H. Hodgkinson,	
Cardiff (accepted) ..	799 15 0

CARDIFF.—For the erection of stables, &c., at Fairwater, for Mr. Thomas David. Messrs. Halliday & Anderson, architects, 16, High-street, Cardiff:—

Jones..... £1,128 19 4	Powell & Mansfield .. £989 0 0
Sowers & Co. . 1,068 10 0	Thomas Gough 979 14 7
Waterman..... 1,025 0 0	W. Thomas & Co.... 940 0 0
Dunn 1,000 0 0	Wm. Cox, Llandaff* 929 0 0
	* Accepted.

CARD (Somerset).—For alterations and additions to Chard Hall, Somerset. Messrs. Lawson & Donkin, architects, Bournemouth:—

Extable £885 0	Fowler & Strickland £600 0
& Sons..... 793 0	W. H. C. Curtis 597 10
ett 748 0	G. H. Blackman, Fareham* 538 0
...ridge..... 730 0	* Accepted.
	[Architect's estimate, £600.]

CHELMSFORD.—For the erection of King Edward VI.'s Grammar School, Chelmsford. Mr. Henry A. Cheers, architect, Twickenham:—

Jackson Bros.	£6,432
Longley & Co.	5,750
T. & W. Pattinson	5,375
P. Johnson	5,140
T. Redhouse	5,112
Thos. Williams	5,030
G. Dobson	4,985
Choate & Son	4,940
Coxhead	4,863
Gorsett & Son	4,816
A. Ansell	£4,795
Alf. Brown	4,736
Everett & Son	4,739
E. West	4,697
R. Potter	4,694
Rogers & Robson.....	4,679
T. Martin	4,650
Grimwood & Son	4,493
J. S. Kimberley	4,435

DARLINGTON.—Accepted for the erection of a disinfecting chamber, &c., at the fever hospital, for the Corporation. Mr. Thomas Smith, Borough Surveyor, Town-hall, Darlington:—

Excavator, Stonemason, Bricklayer, and Plasterer—Haxby Dougill, Darlington.....	£112 12 11
Carpenter and Joiner, Plumber, Painter, and Glazier—W. E. Gent, Darlington	42 5 7
Slater's Work—William Lancaster, Darlington ..	10 17 9

DURHAM.—For rebuilding three bridges in Weardale, for the County Council. Mr. Wm. Crozier, Engineer, Shire Hall, Durham. Quantities by Mr. J. Ezra Miller:—

Daddryshield No. 1 Bridge.

Alfred Thorne	£2,413	0	0
George Richardson..	1,937	6	1
W. C. Atkinson	1,919	13	4
J. G. Gradon	1,813	0	0

* Accepted.

Wearhead Bridge.

Alfred Thorne	£1,635	0	0
Geo. Richardson....	1,419	8	10
W. C. Atkinson	1,379	0	1
J. G. Gradon	1,368	10	0

Irahope Burn Bridge.

Alfred Thorne	£1,546	0	0
George Richardson..	1 243	0	3
W. C. Atkinson	1,241	3	3
J. G. Gradon	1,164	4	0
G. R. Waghorn	1,068	14	6
G. R. Waghorn, Gateshead*	£1,228	17	4
Edward Fairless	1,220	0	0

* Accepted.

G. R. Waghorn, Gateshead*	£1,228	17	4
Edward Fairless	1,220	0	0
Foot, Weardale* ..	1,000	0	0

* Accepted.

Wearhead Bridge.

Alfred Thorne	£1,635	0	0
Geo. Richardson....	1,419	8	10
W. C. Atkinson	1,379	0	1
J. G. Gradon	1,368	10	0
G. R. Waghorn, Gateshead*	£1,228	17	4
Edward Fairless	1,220	0	0

* Accepted.

Irahope Burn Bridge.

Alfred Thorne	£1,546	0	0
George Richardson..	1 243	0	3
W. C. Atkinson	1,241	3	3
J. G. Gradon	1,164	4	0
G. R. Waghorn	1,068	14	6
Ed. Fairless, Wearhead*	£978	14	0
J. Mad.son, Cowes			
Hillf	664	12	0

* Accepted.
† Not including ironwork.

FULHAM.—For constructing sewer, in Normand-lane, for the Fulham Vestry. Mr. James P. Norrington, C.E., Surveyor:—

Jones & Wimpey ..	£729	0	0
C. W. Killingback & Co.	726	0	0
T. Adams.	712	17	6
G. Bell.....	697	0	0
R. Mullett	£613	0	0
H. Lee	596	0	0
E. Parry	589	0	0

GREAT YARMOUTH.—For pewterers' work to the "Gallon Pot," King-street, Great Yarmouth, for Mr. W. Diver. Mr. H. I. Newton, architect, 49, Victoria-street, Westminster, S.W.:—
T. Heath, Gorwell-road (accepted)..... £159 0 0

HALIFAX.—Accepted for the erection of stabling, covered yard and house at Albert Mills, for Messrs. J. M. Howson & Co., Limited. Mr. John Drake, architect, Winterbank, Queensbury, Bradford:—
Yorks.:—

Mason.—Whatmough & Harrison	£37 15 0
Joiner.—W. H. Noble.....	155 0 0
Slater.—Rushworth & Firth.....	25 10 0
Plasterer.—Rushworth & Firth.....	20 10 0
Plumber and Glazier. J. H. Bolton.....	76 15 0
Painter.—Jennings & Whittaker	12 6 6
[All of Halifax.]	

HOVE (Brighton).—For constructing a sewer in Western-place, for the Commissioners. Mr. H. H. Scott, Town Surveyor, Town-hall, Hove, Brighton:—

J. Parsons & Sons.....	£137 10 0
J. G. B. Marshall, Brighton (accepted)	106 0 0

KINGSTON-ON-THAMES.—For a new shop and premises, Richmond road, for Mr. A. Higgs. Mr. R. T. Elsam, architect, 26, Market-place, Kingston. Quantities by the architect:—

W. J. Mataraly	£1,060	G. Merredew	£935
G. Constable.....	1,030	C. Oldridge & Sons.....	920
W. H. Gaze	987	W. Lane, Kingston*	910
		* Accepted.	

KINSON (Hants).—For the erection of a new school and offices at Heatherlands, for the School Board. Messrs. Lawson & Donkin, architects, Bournemouth:—

J. W. Street	£1,182	0	Geo Bevan..... £967 0
Alner	1,125	0	Geo. Baker..... 960 0
E. Smith	1,100	0	W. H. C. Curtis, Poole*.. 937 10
T. C. Ryler.....	1,030	0	* Accepted.

KIRKBY LONSDALE.—Accepted for alterations and additions to Barbon Manor, Kirkby Lonsdale, for the Right Hon. Sir U. J. Kay Shuttleworth, Bart, M.P. Mr. Charles J Ferguson, F.S.A., architect, Carlisle:—

	House.	*Stables.*
Mason's Work—Beaty Bros., Carlisle	£2,368 3 6	£246 11 4
Fireproof Floors and Ironwork—Beaty Bros., Carlisle	444 3 0	48 4 9
Carpenter's and Joiner's Work—H. & W. Davidson, Carlisle.....	1,090 0 0	88 0 0
External Plumbing—H. Braithwaite & Co., Leeds	193 16 0	17 11 8
Internal Plumbing and Iron Drainage—H. Braithwaite & Co., Leeds	322 6 6	
Slating—W. Atkinson, Leeds	66 18 0	6 18 0
Plastering—S. Ferguson & Sons, Carlisle, (Robinson's Cement)*	420 0 0	27 0 0
Painting—H. Braithwaite & Co., Leeds....	115 9 0	5 3 10
	£5,220 16 0	484 9 7

* If ordinary plaster is used in lieu of Robinson's cement, there will be a deduction of £26. 16s.

LONDON.—For the erection of a Sailors' Institute at Millwall Docks, E., for the British and Foreign Sailors' Society. Messrs. J. T. Newman & Jacques, architects, 2, Fen-court, E.C. Quantities by Messrs. R. L. Curtis & Sons:—

Lind & Son	£1,764	0	0
Sharpe.....	1,683	10	0
Hosking	1,627	0	0
Cadey	1,577	0	0
Hearle.....	1,566	0	0
Morter.....	£1,547	0	0
Read.....	1,511	0	0
J. H. Johnson	1,470	0	0
Holland	1,435	0	0

LONDON.—For sundry alterations at 74 and 75, Gracechurch-street, for the Direct Spanish Telegraphic Company. Mr. Thompson, architect, Leadenhall-buildings, Gracechurch-street:—

Porter.....	£. Houghton & Sons* £104
Mollett	148
	* Accepted.

LONDON.—For the erection of office, &c., 175, Drummond-road, Bermondsey, for Mr. H. J. salmon. Mr. Edward Crosse, architect, 32, Bermondsey-square, S.E.:—

R. L. Stuart	£616	10	J. Chalkley £389 14
J. D. Leng	433	0	W. F. Russell, Alscot-
J. Ahmond	400	0	road, Bermondsey* 380 0
			* Accepted.

LONDON.—For pulling down house and rebuilding same, and building additional class-rooms to Mrs. Newcomen's schools, Newcomen-street, Borough. Messrs. Stock, Page, & Stock, architects, Denman street, London Bridge:—

Bagulay	£1,750	W. & H. Castle, South-	
B. Wells	1,454	wark Bridge-road*	£1,347
Jose'yn & Young.....	1,377	* Accepted.	

LONDON.—For drainage works at Lambeth Infirmary, for the Guardians of the parish of St. Mary, Lambeth. Mr. Thomas W. Aldwinckle, architect, 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied:—

Dickenson	£2,590	W. Johnson & Co.	£1,785
J. Mills	1,898	J. G. B. Marshall	1,777
M. Marsland.....	1,883	Turtle & Appleton	1,715
J. Peattie	1,795	J. Holland (accepted)....	1,587

LONDON.—For making up Beaumont-crescent and Wandsworth Bridge-road, Sec. IIa, Fulham, for the Fulham Vestry. Mr. W. Sykes, New Streets Surveyor:—

Name of Contractor.	Beaumont-crescent.				Wandsworth Bridge-road, Sect. IIa.			
	R.	Y.	V.	I.	R.	Y.	V.	I.
	£	£	£	£	£	£	£	£
Nowell & Robson	187	14	—	—	119	68	—	—
T. Adams.....	109	26	25	25	129	69	60	56
G. Bell	205	33	32	31	129	73	64	61
Tomes & Wimpey.....	206	28	—	—	—	—	—	—

R.—All work except the actual paving. Y.—York stone paving. V.—Victoria stone paving. I.—Imperial stone paving.

LONDON.—For completing for occupation two houses, situate in Nightingale-square, Clapham, for the Suburban Lands Syndicate, Limited. Mr. Thomas Spink, surveyor, 26, Charing-cross, S.W.:—

W. Rowsell	£1,275	0	W. Lawrence..... £843 0
Hy. Eady	979	17	Whedler & Co., Peckham-
E. J. Edwards	947	0	rye* 838 10
			* Recommended for acceptance.
			[Surveyor's estimate, £870.]

LONDON.—For additions and alterations at 23, Upper Thames-street, E.C., for Messrs. C. Davidson & Sons, Limited. Messrs. Hudson & Booth, architects:—

F. & H. F. Higgs	£1,180	Waddington & Co.....	£985
B. E. Nightingale	1,018	Eaton & Co.....	810

LONDON.—For alterations and additions to the Shoreditch Branch of the Central Bank of London (Limited), including new granite front. Mr. Herbert Knight, architect, 129, Cheapside, E.C. Quantities by Mr. H. Branch, 25, Cheapside, E.C.:—
T. L. Green (accepted)..... £3,373 0 0

LONDON, E.C.—For pewterers' work to the "Daniel Lambert Hotel, Ludgate Hill, E.C., for Mr. R. H. Barnes. Mr. H. I. Newton, architect, 49, Victoria-street, Westminster, S.W.:—

Watts & Co.	£207	17	Sanders & Son, High
T. Heath	191	0	Holborn* £147 10
W. Helling	177	0	* Accepted.

LONDON.—For repairs, painting, &c., at 30, Lower Phillimore-place, Kensington, for Dr. Bowering. Messrs. Chadwick, surveyors, 17, Parliament-street, S.W.:—

Laing	£155	C. F. Kearley, Kensington*	£128
Duffield & Son	148	* Accepted.	

LONDON.—For repairs, painting, &c., at 21 and 22, Devonshire-road, S.W., for Mr. G. Reviers. Messrs. Chadwick, surveyors, 17, Parliament-street, S.W.:—

Richardson.....	£296	10	C. F. Kearley, Kensing-
Laing.....	170	5	ton (accepted) £158 0

LONDON.—For repairs, painting, &c., at 13, Cleve road, West Hampstead, for the Committee of St. James Vicarage. Mr. Thos. Newell, architect, 5, York-buildings, Strand, W.C.:—

Godfrey, Giles, & Co.	£279	17	C. F. Kearley, Kensing-
Summer	215	10	ton (accepted) £213

LONDON.—For the erection of a hoarding at the St. Luke's Workhouse, City-road, E.C., for the Guardians of the Holborn Union. Mr. H. Saxon Snell, architect:—

J. J. Thompson.....	£148	0	W. J. Aldred..... £119 0
Edward Coward	138	0	H. Wall & Company 115 0
W. C. Mataraly	132	10	B. E. Nightingale, Albert
Wm. Bamford	130	0	Embankment (accepted) 104 0
John Robinson	120	0	

NEWMARKET. — For the erection of training stables, &c., trainer's house and private residence at Exning, near Newmarket, for the Right Hon. the Earl of Durham. Mr. J. Gibson Cowe, architect, Lambton, co. Durham:—

Training Stables.

J. Simpson & Son	£3,300	Hy. Linzell, Newmarket*	£3,200
Wm. Bell	3,293	* Accepted.	

Trainer's House.

Hy. Linzell, Newmarket (accepted)	£1,843

Additions to Private Residence.

Hy. Linzell, Newmarket (accepted)	£4 317

NORTHAMPTON. —For the erection of new co-operative stores, at West Haddon, for the West Haddon Self-Assistance, Industrial and Co-operative Society, Limited. Mr. Saml. Adams, architect, West Haddon:—

Thos. Seal	£221	0	J. Marsh..... £213 0
Jas. Palmer	221	0	J. A. Johnson..... 205 10
J. Yeates & Son	218	0	Leatherland Bros. 177 0
S. Adams	218	0	Walter Watts 149 18 10½

NORWICH.—For the erection of residence, for Mr. A. W. Bell. Mr. B. B. Morgan, architect and surveyor. Quantities by Mr. A. C. Harris, Norwich:—

J. Young & Son	£1,089	0	C. Pitcher..... £975 0 0
Scarles Bros.....	1,050	0	B. Daws..... 937 0 0
J. Fye	1,045	0	Smith & Watling,
S. Wilkins.....	1,047	0	Norwich* 934 0 0
S. Chapman & Son..	1,029	0	J. E. Evans (too late). 912 12 6
R. Foulser.....	998	0	
			* Accepted, subject to deductions.

NORWICH.—For the erection of school, hall, &c., for the trustees of the Primitive Methodist Connexion. Mr. A. F. Scott, architect and surveyor, Norwich. Quantities supplied:—

R. W. Bennett.....	£868	H. Lacey	£730
Scarles Bros	770	S. Hall	716
J. Yeates & Son.....	759	R. Daws	695
Chapman & Son.....	749	Smith & Watling	669
Curtis.....	738	J. Evans*	580
Grimble	734	* Accepted.	

ORLESTONE (Kent).—For alterations to cottage at Orlestone, Kent, for Messrs. Oliver. Mr. P. M. Johnston, architect:—
Knock..... £790 Dryland, Ashford* £585
Bourne ..... 580 * Accepted.

PARKSTONE (Dorset).—For erecting and completing a house on the Upper Bourne Estate, Parkstone, Dorset, for Assistant-Commissary General A. E. Fetris. Messrs. Lawson & Donkin, architects, Bournemouth:—

George & Harding	£1,038	0	J. White..... £925 0
Barrow & Entwistle ..	1,000	0	Jenkins & Son..... 914 0
Geo. Bevan.....	968	10	W. H. C. Curtis 910 0
Wm. Hoare.....	945	0	W. Scott, Parkstone* 760 14
Hammerton & White	942	0	* Accepted.

PONTYPRIDD.—For the erection of nine cottages, at Cymmer, Glyncorrug, for Mr. George Evans. Mr. Arthur O. Evans, architect, Town Hall, Pontypridd:—

Williams & Sons	£1,800	0	D. Lloyd, Cymmer,
B. Cole & Sons	1,309	10	Bridgend* £1,275 0
W. Thomas & Son.....	1,273	0	* Accepted.

QUEENSBURY (Yorks.).—Accepted for main drainage works, for the Queensbury Local Board. Mr. John Drake, Surveyor, Queensbury:—

Contract No. 6. Sections 1, 2, and 3.

	Section 1.	Section 2.	Section 3.
E. Kellett, Cecil-avenue, Bradford..	£718	£336	£506

ROSS (Herefordshire).—For the erection of a head-gardener's house at Goodrich Court, for Mr. H. C. Moffatt, J.P. Mr. Arthur Pole Small, architect, High-street, Ross:—

W. H. Smith, Weston-under Penyard £650 0 0

ROSS (Herefordshire).—For the erection of a small villa residence at Ashfield, for Mr. Samuel Llewellyn. Mr. Arthur Pole Small, architect, High-street, Ross:—

H. Millward, Ross and Leominster £750 0 0

SEDGEFIELD (Durham).—For works at the Sedgefield Lunatic Asylum, in the County of Durham. Mr. Wm. Crozier, architect, Shire Hall, Durham:—

Cemetery Chapel.

John Shepherd	£302 0 0	W. C. Atkinson, Stockton-on-Tees*	£300 11 3
J. G. Gradon	351 0 0		
F. Caldcleugh	320 0 0	* Accepted.	

New Water-closet Block.

W. C. Atkinson	£486 11 11	John Shepherd	£462 0 0
J. G. Gradon	480 15 0	F. Caldcleugh, Durham*	448 0 0

* Accepted

For both Chapel and Water-closet Block.

George Marshall..... £767 11 4

SOUTHAMPTON.—For additions, alterations, &c., to cattle-market, baths, and fire-brigade station, for the Corporation of Southampton. Mr. W. B. G. Bennett, Borough Surveyor, Southampton:—

Cattle Lairs.

Morgan, Isted, & Morgan	£248 0 0	J. Crook & Son, Southampton*	£190 0 0
H. Bonley	230 0 0	J. W. Rowland	180 0 0
H. Filsell	198 0 0	J. W. Roe & Co.....	174 10 0
J. Bull, Sons, & Co. ...	153 0 0		

[Engineer's estimate, £175]

Alterations and Additions to Fire Brigade Quarters

Morgan, Isted, & Morgan	£268 0 0	J. W. Roe & Co.....	£210 10 0
J. W. Rowland	230 0 0	J. Crook & son, Southampt n*	204 9 0
J. Bull, Sons, & Co. ..	218 0 0	H. Filsell	188 0 0

[Borough Engineer's estimate, £230.]

Concreting Bed of Open Swimming Bath.

J. Bull, Sons, & Co.	£417	Roe & Co., Southampton* ..	£310
Morgan, Isted, & Morgan ..	346		

[Borough Engineer's estimate, £360.]

Supply of Twenty Dressing Boxes at Baths.

Mount Pleasant S. S. Mill Co.	£513 0 0	Morgan, Isted, & Morgan	£475 0 0
J. Bull, Sons, & Co. ..	483 0 0	J. W. Roe & Co., Southampton*	436 16 3
J. Crook & Son	479 10 0	H. Filsell	392 14 0

[Borough Engineer's estimate, £360.]

For the Supply of Iron Railings for Public Parks.

W. J. Viney	3s. 3½d. per yd.	The Economic Fencing Co. ..	2s. 7d. per yd.
F. Shalders	2s. 10½d. ,,	G. B. Smith & Co., Glasgow* ..	2s. 5d. ,,
Sauby & Co.	2s. 8½d. ,,		
M. McVey	2s. 8d. ,,		

Dredging Works.

Roe & Co.	£525	W. Gannaway	£500

[Borough Engineer's estimate, £450.]

* Accepted.

SPRING GROVE (Isleworth).—For alterations and repairs, &c., to estate offices, for Mr. H. D. Davies. Mr. H. Bushell, 1, Finsbury-circus, E.C., surveyor:

Edmunds	£126 0	Pearce & Co., London* ..	£98
D. Taylor	125 10	* Accepted	

[Surveyor's estimate, £120.]

WEST HAM.—For additional staircases and exit-doors, at the North-street, Channelsea, Salway place, and Colegrave-road Schools, for the West Ham School Board. Mr. J. T. Newman and Jacques, Architects to the Board, 2, Fen court, E.C. Quantities by Messrs. R. L. Curtis & Sons:—

	North-street.	Channelsea.	Salway-place.	Colegrave-road.
Sharpe	£221	£285	£146	£190
Maddison	211	244	123	159
Reed	230	274	171	211
Morter	239	277	175	213
Wyles	270	291	222	267
Hearle & Co...	245	283	174	221
Norton & Son ..	238	282	179	218
Catley	242	284	180	217
Hosking	225	276	173	207

WOOD GREEN (Middlesex).—For alterations to the Alexandra Palace Hotel, Wood Green, N., for Mr. William Earles. Messrs. Northcroft, Son, & Neighbour, surveyors, 57, Charing Cross:—

	Walnut.	Pitch Pine.	Red Deal.
Holloway Bros., Battersea	£1,461	£1,254	£1,229
Mower & Son, Hackney	1,447	1,247	1,128
Johnson & Co., Wandsworth....	1,442	1,238	1,230
Nunn, Wood Green	1,399	1,364	1,044
Ward & Son, Wood Green..	1,138	1,115	1,050
Richardson, Pelham	1,328	1,020	960
Veller, Truro-road, Wood Green*	1,07	1,040	954

* Accepted.

WOLVERHAMPTON.—For the erection of a villa residence. Mr. Joseph Lavender, architect:—

Geo. Cave	£810	Bradney & Co.....	£780
H. Gough	785	Ford & Sons	770
H. Willcock.....	783	B. Guest (accepted)	740

[All of Wolverhampton.]

WOLVERHAMPTON.—For building new Sunday schools at Shipley. Mr. Joseph Lavender, architect, Wolverhampton:—

G. Cave	£655	Bradney & Co.*	£531
B. Guest	575	Davis	470
H. Willcock	550	* Accepted.	

[All of Wolverhampton.]

WOOLWICH.—For rebuilding branch premises, for the London and Provincial Bank. Mr. Henry H. Church, architect, Woolwich. Quantities by Mr. Wm. Henry Strudwick:—

Woodward & Co.	£5,923	Allen & Sons	£5,333
Patman & Fotheringham..	5,750	Munday & Sons.....	5,295
Chapman	5,579	Morter.....	5,243
Kirk & Randall	5,443	Proctor	5,175
Nightingale	5,380	Richardson (withdrawn) ..	4,689

Infirmary Buildings, Tunbridge Wells.—In the list of tenders for this work in the *Builder* for March 28, p. 258, it should have been stated that the lowest tender, that of Mr. E. Thurbon, was *withdrawn*.

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G. & R.—R. L.—E. W.—J. M. W. (next week).—C. M. (next week).—C. J. C. F. (too late).—C. I. (too late).

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The Builder.

VOL. LXI. No. 2317. SATURDAY, MAY 2, 1891.

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St. Augustine's Church, Tonge Moor: Interior View.—Mr. R. Knill Freeman, Architect ..... *Double-Page Photo-Litho.*
Tomb of Ferdinand & Isabella, Capilla Real, Granada.—Drawn by Mr. H. V. Lanchester ..... *Single-Page Ink-Photo.*
Tomb of Felipe I. and Juana, Capilla Real, Granada.—Drawn by Mr. H. V. Lanchester ..... *Single-Page Ink-Photo.*

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Architecture at the Royal Academy.

WE fear it can hardly be said that the architectural room at the Royal Academy is of very high interest this year. It is a rather mixed collection, and contains hardly any drawings of central and pre-eminent interest; and some of the most important designs appear to have been capriciously shunted into sidings, so as to give the collection, as a whole, even less point and interest than it might otherwise have had.

A very fine pen-and-ink drawing of the front of Messrs. Webb & Bell's Birmingham Law Courts (1,786) occupies the central place on the east wall of the room. The drawing is by Mr. Raffles Davison, and conveys very well the rich texture produced as well by the detail as by the material of the building. The process of scoring down for shadow is carried a little too far in some parts of the drawing, but the total effect as a picture is fine and luminous, and does justice to the architecture of one of the most picturesque municipal buildings of modern times. This is the only drawing one can fix upon as a specially central and conspicuous object in the room, and perhaps wherefore we may most suitably pass from this to examine the other designs of a municipal class which are exhibited. Of these the most conspicuous is the large pen-and-ink drawing of Mr. Robson's "People's Palace for East London; South Front" (1,744) representing the intended completion of the building towards the Mile-End road. This shows a façade with a recessed centre with two wings. The upper portion of the centre is treated in a manner somewhat similar to the same architect's well-known building for the Institute of Painters in Water Colours in Piccadilly; broad fluted pilasters decorate the work up to a certain height, with square finials above the pilasters and mullioned and transomed windows between them; above and recessed back from this is a mass of plain walling with a strong cornice and panelled balustrade; a row of festoons decorates the wall immediately below the cornice. Behind this rises a pediment with an order of square massive pilasters or engaged columns, flanked by a cupola at each angle. The wings of the front façade are treated with a couple of square pilasters at each side above the first-floor string, each couple crowned with a rather heavy broken curved cornice. The centre portion of each wing is filled up with a bay segmental on plan, rising from the ground to about half the height of the order of pilasters. The pilaster stuck on the middle of this bay looks rather out of place and has a heavy appearance. On the ground story, on either side of the bay, is a heavy square-lined architrave, enclosing on one side an entrance door and on the other side a large empty niche. This is not very satisfactory, and is a somewhat old-fashioned way of securing symmetry on each side of the projection without any very direct reference to what we must presume are the requirements of the plan (no plan is given), the presence of the niche looking rather as if the architect was at a loss what to do with that portion of the design. The ground story in the middle portion of the front is occupied by a loggia with heavy square rusticated columns. The general effect of the design is that of solidity combined with a rather ponderous effect, the style of architecture adopted being of rather a rigid kind, not accommodating itself easily to variety or picturesqueness of treatment.

Mr. Albert J. Bolton's design for the "South-West London Polytechnic Institute" (1,736) is the perspective submitted in the competition, and on which we have before commented in noticing the competition drawings at the time of their exhibition. It looks none the worse for being hung a little high, as it has a general richness and a good balance of effect, while in detail it is not quite so satisfactory. The large drawing of Mr. Mountford's design for the "Sheffield Municipal Buildings" (1,931) has been very unfairly treated in being hung at the top; as the most important new work of its class it merited a more prominent position, and the drawing, though it might be better, is certainly not so weak as to justify this apparent forgetfulness of the importance of the building. The detail is consequently almost lost. The drawing is a water-colour somewhat loaded in style, but with a good solid effect. The ponderous square tower, with its enriched upper story and cupola, would have been more effective if the stalk had been left sternly plain instead of being partially treated with long strips of pilaster, and perhaps a slightly narrower proportion would have added to its effect. The corner-piece, with the loggia in the upper story, which connects the base of the tower with the front, does not seem quite sufficiently connected with either, and has too much the appearance of being stuck on to the composition, and the bit of roof seen over the balustrade and clinging against the walls does not improve it in this respect. Otherwise it is a dignified building distinctly municipal in character.

Messrs. Moore & White's "Premiated Design for the Victoria Institute at Worcester" (1,743) is shown not in a perspective, but in a series of elevations with plans appended, a method of representation which we should be glad to meet with more frequently in the architectural room of the Academy. The structure consists practically of two buildings joined by a covered way, the west block containing the library and galleries and the east one the science and art schools. The west elevation, containing the entrance to the library block, is the most important, and shows a freely-treated Elizabethan architecture, with mullioned windows, and pilasters hung on to the upper part of the walls and carried on corbels supported by small winged terminal figures. The entrance is marked by a small tower with an octagonal cupola, the doorway being treated with some richness, with sculptured decorations in the spandrels, &c. The west elevation has gables with the Elizabethan curved finials; the east elevation, where is the entry to the science and art schools, shows two wide, straight-lined gables, and a small octagonal turret at the south-east angle, which, however marks nothing in particular,—only containing lavatories, which are exactly the things that should not be marked. The lecture theatre, a large quadrangular apartment lighted from windows towards the street, occupies the principal part of the southern side, and has on the other side, apparently, a row of borrowed-light windows to give light to the central corridor; not a very good arrangement. The elementary room occupies the correspond-

ing position on the first floor. The designing and modelling room, life class room, and antique room occupy the rest of the first floor. The news room, lending library, and reading room occupy the southern or larger portion of the library block, with a row of very large windows facing south; not the best aspect, the rooms will be hot and exposed to a great deal of sunlight in summer. The competitors were, we believe, cut down very close as to cost, and therefore the design must be considered with the recollection of this restriction. It is suitable in appearance to its purpose, but hardly presents much architectural interest.

Mr. John O. Scott's "Tower of the University Buildings at Glasgow" (1,755), shown in a powerful pen drawing, is rather unfortunately divided into three equal heights by the heavy corbelled balconies stretching across the front of it, and seems rather to want balance and concentration of treatment. There are three stories of repetition of exactly the same coupled pointed windows, and a fourth story of larger windows of the same general design. Consequently there is rather an all-over-the-same-look about it, and not sufficient emphasis is given to any one part, and even the heavy corbelled-out turrets at the angles hardly avail to subordinate the rest of the design. The finish is a rich but rather heavy octagonal flèche of panelled open stonework. There is a general richness and dignity about it, but it wants a more plain and subdued treatment of some portions, to give picturesque and individual expression to the whole.

Mr. Hare's "Portion of Design for Sheffield Municipal Buildings" (1,789) is a remarkably well-executed water-colour, with rich and harmonious tinting in the stonework which gives it a very pleasant impression to the eye. It shows, in sharp perspective, one wing of the proposed building, with a lofty corbelled-out oriel window as the principal feature, and a portion of the arcaded first-floor loggia of the central portion seen beyond. Over the oriel is a *fronton* hiding the roof gable, decorated with a small order of superimposed columns. The nearer portion of the building is treated in an exceedingly massive manner, with an expanse of solid wall which contrasts well with the richness of the other portion. The details are a little wanting in refinement, but as a bit of architectural composition it is very effective, both in design and drawing.

Next to this hangs a still better work, Mr. F. G. Knight's "Centenary Hall, Royal Masonic Institution for Girls, Battersea-rise" (1,796). This is a pen drawing by Mr. Knight in his best style, which is saying everything for it in regard to execution; and the architectural treatment is both original and refined. It is a large hall partaking of the characteristics both of Late Gothic and Elizabethan. The lower portion is treated with a series of deeply-recessed four-centred arches at the sides, with galleries or alcoves projected across each arch at the middle of its height, access being gained to these by a kind of "triforium passage" behind the piers. Below the galleries the walls are wainscotted. The upper portion is pierced with large Late Gothic windows corresponding with the arches below. The ceiling is a waggon vault of elliptical section in the centre, supported by a large cove at each side springing from the walls; a heavy moulded longitudinal rib divides the cove from the centre span, and from this depend the stalks of the large hanging metal chandeliers of very elegant design. The ceiling is plaster treated with a rich flat ornamentation of Elizabethan strapwork. A large traceried window and two small ones occupy the end of the hall above the galleries, the smaller windows falling partially under the coves, the centre one rising well up into the central ellipse of the ceiling. The architecture is both dignified and refined, and in every way the drawing is one of the best in the room and ought to have had a central place instead of being put down near the floor at one side. But the system (or no system) of hanging in the architectural room of the Academy is a mystery which we have long ago given up.

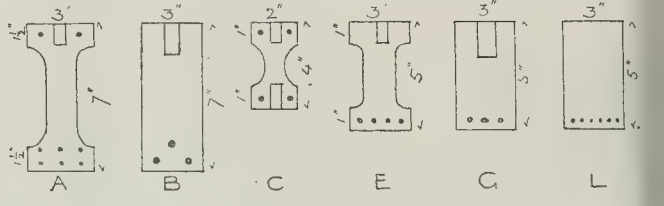
The "Principal Entrance to the Sheffield Municipal Buildings" (1873), by Mr. Mountford, is a well-executed tinted drawing showing the centre feature of the building; a round-arched entrance is placed between coupled columns of a Roman Doric order, with a cornice and balustrade over, and above this is a deep round-arched recess with two mullioned windows at back of it. A comparison of this with the general view of the building opposite shows an important alteration in the substitution of this wide arch for the two smaller ones shown in the original design; the alteration is a decided improvement. The centre portion is flanked by octagonal turrets which only clear themselves above the cornice of the entrance-door order, and below that rest on a solid wall plane flush with the jambs of the entrance archway, giving an effect of great solidity. There is a gable over the centre, rising from between the two turrets, and above is seen a picturesque roof turret on the ridge. This is a good drawing and a very pleasing bit of architectural composition.

Mr. A. Koch exhibits a design (a competition design we presume) for the "Palace of the Chamber of Deputies at Bucharest" (1,901), a heavy square Classic pile of some dignity, spoiled by an enormous kind of Mansard-shaped cupola over the centre. If some more graceful form of central roof had been hit upon, the design would not have been unworthy of its purpose, though it is terribly ponderous both in mass and detail. A "Design for Municipal Buildings," by Mr. Sidney R. Smith (1,933) is not further characterised in any way; whether it is a competition design or a mere imagination does not appear. The pen drawing is a little spoiled by overworking and lining; the design is a pure Classic one, with a lofty rusticated basement of two stories and a Corinthian order over it. A tower and octagonal cupola rises behind the central gable. There is unfortunately nothing original in the whole design, it is a meritorious treatment of the ordinary materials of a Classic town hall. Messrs. Morris & Hunter's "Design for the Public Library at Ayr" (1,857) is another of the municipal designs, apparently a very good tinted drawing, hung very high and not easy to see in detail. It is in the modern free Classic style, with two wings and a long centre, with an arcaded loggia on the ground story. The porch projects from the centre of the building in rather an inconsequent way. The general appearance of the building would have been much improved if the wings had been kept higher instead of lower than the centre portion; the centre is covered with a large hipped roof and ridge lantern in the middle of it, and the wings roofed with ridges at right-angles to the front and at a lower level than the centre roof. Consequently there is an awkward gap between the roofs, and the whole building does not seem to hang together sufficiently. Mr. Albert T. Smith's "Design for a Technical College" (1,841) is a design of more or less Elizabethan character but showing some originality of treatment, especially in the square turrets with vertical panelling which flank the centre and side gables.

These complete the designs which may be more or less classed together as of the nature of municipal or public buildings; the last two perhaps hardly coming strictly within that category, but it was convenient to include them under it for the present purpose. All other drawings of importance will be mentioned in future articles.

TESTS OF IRON AND CONCRETE BEAMS.

An interesting series of experiments was made on Tuesday last, at Mr. Kirkaldy's testing rooms, on some joists composed of concrete with iron rods imbedded in them, in accordance with a patent taken out by Mr. F. G. Edwards. The sections of joists tested are given in the accompanying diagram.



Theoretically it would seem probable that in such a case either the concrete would be crushed before the iron came fully into play, and that the ultimate strength of the joist would really prove to be that of the iron *minus* the concrete, or that the iron would draw through the concrete when the bending strain came upon it; and we believe that this has been the case in some former experiments that have been made. It seems inherently improbable that the two materials would act together in resisting strain. The experiments of Tuesday last, however, proved that the iron, in the form here applied, of an association of thin rods, would resist a very considerable strain and deflection without drawing; indeed not one of the experiments showed any symptom of the iron drawing, and in one case it actually appeared that the iron rods had been perceptibly attenuated by the strain without losing their hold on the concrete.

The concrete for the whole of the specimens was of equal parts of Portland cement and coke breeze. Specimens A, C, D, E, and F were of twenty-one days concrete, the remainder of seven days concrete. The breeze for the twenty-one day specimens was passed through a ½-in. mesh, that for seventeen day specimens through a ½-in. mesh. The small space marked off in the centre of the upper face of the joists consists of soft concrete for nailing into. This is a necessity, of course, if flooring boards are to be fixed down to it by nailing, but it weakens the compressive strength of the joist where this is most needed, and as a test of the strength of the concrete joist in this respect it somewhat vitiates the experiments.

All the tests consisted of the application of cross-strain at the centre of the beam. The first test was with the section marked A, the only one of the joists in which rods were introduced at the upper as well as at the lower portion of the section (for the section C is intended for uprights, and not for use as a joist). Six rods are imbedded at the lower edge of the joist and two at the upper, all of ·25 in. diameter. In this test the lower side of the concrete cracked at a pressure of 2,853 lbs., and the joist was broken at 2,867 lbs., after a deflection of ·202 in. Before this one of the upper iron rods had buckled out sideways with the compressing strain and broken up the surface of the concrete; which was very much what might have been expected. The bearing between supports was 10 ft.

In section B (seven days concrete) three iron rods, ·5 in. diameter, are imbedded so as to form a triangular position on section, near the lower edge of the joist. This specimen commenced crushing at the top at 2,874 lbs., with a deflection of 1·48 in., and its strength

as gone after that, as with considerable additional pressure the steelyard never rose again.

C (21 days concrete) has two rods ·19 in. diameter in each flange. It was subjected to the same test of cross-strain, though as observed, not intended especially for that class of strain. The lower edge cracked at 416 lbs., and ·71 in. deflection; the upper wires did not buckle.

D was another test with the same section, which cracked at 377 lbs. and broke with two clean cracks close to each other. In this and all the other tests except K and L (K being a 9 by 3 fir joist) the real strength of the beam was gone after the first crack, the steelyard never rising again.

E is a section with four ·25-in. rods in the lower flange. This and the remainder, as before noted, were tested with a 6-ft. bearing fully. The lower edge cracked at 2,369 lbs. with ·51-in. deflection. F was a repetition with similar specimen, the bottom flange cracked at 2,021 lbs., ·63-in. deflection.

G has three rods in the bottom flange of ·75-in. diameter. This cracked at the bottom and crushed at the top simultaneously at 2,494 lbs., ·92-in. deflection. On the final failure the concrete broke away from the iron.

H was a duplicate of the same specimen. It broke at 2,508 lbs. the results were much the same as in the last specimen; deflection ·86 in. With further pressure one half the length of the joist separated above the line of the iron, leaving a long open fissure.

J was a test of a concrete beam of similar section to G but without any iron in it. It broke suddenly right through, and dropped in two halves, at 431 lbs.: ·06 in. deflection.

K was, as mentioned, a 5 by 3 fir joist of exceptionally good timber. It commenced to crush on the upper side at 5,438 lbs. with ·6 in. deflection. It failed entirely at 7,107 lbs., the lower edge going in long fibres one by one after crack in succession.

L was a 6 ft. 6 in. lintel with the ends resting and a 3-ft. bearing. Six rods ·19 in. diameter were imbedded in it in such a way as to be near the top flange at the end portions which were clamped, and carried down to the bottom flange at the unsupported portion; this as forming a test for the stresses caused by fixing the ends. The concrete was slightly inverted at the upper edge in fixing the press against it before commencing the experiment. At 4,607 lbs. it began to crack at the bottom, with ·42 in. deflection, but sustained 5,104 lbs. before failing. There was little sign of failure at the points which were fixed and clamped, the failure was almost entirely in the centre.

The tests seem to establish the fact that concrete combined with iron rods in this form will sustain a far greater cross-strain than concrete alone will sustain, and that the concrete will crush before the rods will draw through it. The most important point to notice, perhaps, is the remarkable discrepancy between the behaviour of the concrete and that of the pure concrete, and the manner in which the latter broke short in suddenly, without a moment's warning. On the other hand there is no doubt considerable waste of strength in the iron rods, which were always perfectly sound, though after the concrete was completely crushed. Much thinner rods would suffice for the tension, but in all probability, having less surface hold, they would draw through the concrete. The contrast again between the crushing weights of the concrete and iron joists and that of the fir joist is significant, showing the difference between a really homogeneous joist and one composed of two materials of opposite properties. It is proved that the latter will work together to a greater extent than had been supposed; but one can hardly call it a scientific construction; all that can be said is that it will answer up to a certain point, though a good deal of the tensile strength of the iron is wasted. It is suggested that such joists as these would be very valuable as ground-floor joists, where it is desirable to have something that cannot be affected by damp. No doubt also the section C would be useful, from a sanitary and fire-resisting point of view, as quartering for partitions. But the combination is a compromise, not a complete adjustment of forces, and it can hardly be otherwise. Nevertheless, the experiments were interesting and valuable, and we are indebted to the patentee and Mr. Kirkaldy for giving us the opportunity of witnessing them.

NOTES.

YESTERDAY (Friday), at noon, the Berlin International Art Exhibition was to be opened by the Dowager Empress Frederick, in presence of the Emperor and his Court, with all due ceremony and military pomp, but without the splendour originally intended, owing to the Court mourning for the late Field-Marshal von Moltke. In Berlin great curiosity prevails as to the standard this exhibition will show, or in what state of completion it will be on opening-day, the grounds and buildings having been so carefully guarded that even representatives of the local press have not been able to obtain any information on the subject, much less to judge for themselves. We are, on good authority, able to state that the opening-day will see the exhibition, as a whole, complete, and that only one or two of the groups (among these England, we are sorry to see) are likely to mar the impression by being in a state of semi-completion. The visitor will take home a good impression of the exhibition, the arrangement of the halls, the distribution of the groups, the hanging and the quality of the work shown, and will have reason to be satisfied with the doings of both managing and hanging committees, although the latter of these two bodies may, to those who have chanced to see them at work and have viewed the hundreds of non-accepted works, have but a poor right to being called a model or an unprejudiced one. The exhibition, although it can scarcely be called an "international" one, and may cause some disappointment in this respect, will certainly be a success and figure highly in the annals of well-managed art exhibitions. We hope to be able to give a full description at a later date; for the present we will only state that oil painting has the largest space, that sculpture comes next, that black-and-whites and watercolours are difficult to find, and that architecture forms a small, but excellently-arranged, group of itself, in which a good representation of the work done by the German members of the profession is given, and some good specimens of Russian, Italian, and Austrian draughtsmanship are shown. What English work will be when on view in this architectural division, we do not know, the space destined for it is void, the cases are still unpacked. In the hall in which the English group proper will have room found for it, we could already see that the collection of oil-paintings here, although small, will be a select one, and that a good show will be made by the black-and-white work. Among the names of those whose pictures are or will be definitely hung in our group we notice those of Messrs. Aumonier, Collier, Crane, John Gilbert, Herkomer, Frank Holl, Colin Hunter, Sir F. Leighton, Linton, Yeend King, Sir J. Millais, H. Moore, David Murray, Ouless, Pettie, W. B. Richmond, J. J. Shannon, Waterlow, Wyllie, &c.

NOT the least satisfactory feature of the meeting held at Liverpool on Saturday last to further the principle of conciliation in labour disputes is to be found in the fact that it was promoted by a committee of working men. In spite of the success which has attended a considerable proportion of the strikes of the past few years, the moderate and thinking men in the "labour" ranks are beginning to recognise the evils attendant even upon success, and are willing to receive more education as to the true relations of capital to labour. Lord Brassey made a most useful and convincing speech, and pointed out the necessity which existed for working men to acquire accurate information as to the prospects of trade, the working of competition, and the profits which were being realised. Many a man receives wage-money,—and that in a discontented and unthankful spirit,—which will not produce a penny in profits for his employer, but which has to be expended in order to keep a hold on certain trade, with a prospect of recoupment in the future. Then a strike will undo all that has been done at so much risk, rendering the capitalists' foresight and enterprise unavailing; and whatever apparent success may be achieved by the striker, the business with which he is connected almost invariably suffers. A large proportion of the workers in the shipping and produce trades of Liverpool are in favour of the establishment of a board of reference to consist of *bonâ fide* employers and workmen, and a resolution was carried at the meeting alluded to, recommending the formation of such a board. This movement being designed with a view of preventing the recurrence of strikes, is worthy of support and success. Lord Brassey spoke of the difference existing between conciliation and arbitration, pointing out that the former was the best mode of settling labour disputes. The value of courts of arbitration, however, is being increasingly recognised, and a scheme was submitted to the Corporation of London last week, for the establishment of a Chamber of Arbitration, to which the mercantile community trading in the metropolis might submit differences arising in the course of their respective businesses. It is thought that most of the expenses connected with such a chamber could be met by the fees to be paid by disputants. The scheme is largely supported, and will in all probability be carried out.

DR. BLAXALL'S report to the Local Government Board upon the sanitary condition and administration of the rural sanitary district of Staines, Middlesex, discloses a state of things which is about as bad as it could be, and appears in the highest degree discreditable to the local sanitary authority. Dr. Blaxall reports that he made an exhaustive inspection of the district, visiting the several villages, hamlets, and blocks of new buildings, with the result of finding at every step of the inquiry unmistakable evidence of the want of efficient sanitary administration. Among other things, we read:—

"At Sipson the authority have recently converted a series of catchpits into a so-called sewer, by means of glazed pipes laid from pit to pit to carry the overflow from one to the other, till finally the sewage passes into an open ditch. This continues alongside the high road, and is complained of as a nuisance by the inhabitants of neighbouring dwellings. The first of the catchpits receives the drainage of several cottages, and is situated within a few feet of the end cottage, the occupants of which complain of the intolerable stench from it. Indeed, they have reason, for the contents of the catchpit amounted at the time of my visit to some 4 ft. of black stinking mud. And from this point onwards, this series of stinking pits gives rise to nuisance. They are called "sewers," but offend against every principle of sewer construction. . . . The authority have been content to allow the old cesspit privies to continue in general use regardless of the attendant evils of filth-pollution of earth, air, and water. Some few cesspits are shallow and open, but they are mostly covered in and sunk some feet into the soil. This allows, and no doubt is intended to allow, of long storage of excrement and of the oozing away of the fluid contents of cesspools. This soakage into the gravel takes place readily when the sub-soil water is low, but as the water rises the cesspits are apt to refill so as sometimes to overflow at the drain inlets; this is especially the case where slop drains communicate with the privy-pit. A few examples came under notice of privy-pits overflowing direct into neighbouring streams. So I met with examples of every kind and every degree of cesspit nuisances, up to cases where people were living in houses with walls saturated with privy filth and with the rooms stinking with privy effluvia; the people suffering from nausea, sore-throats, and the like. In a few instances pail-closets are in use, and, although not properly kept, they were a marked improvement upon the cesspit privies generally in vogue in the district.

The water supply of the Staines Rural District is mainly derived from wells sunk in the sub-soil, from which it is raised by pumps or buckets, or through the so-called Abyssinian tubes. Now, seeing that cesspools, privy-pits, and wells are sunk in the common gravel within a few feet or yards of each other, and that the liquids in them rise and fall with the water in the sub-soil, there can be no doubt about what it is that the inhabitants have to consume under the name of water; and the fact of habitual pollution of water in these wells is evidenced by the frequent complaints made by the inhabitants about their water, and by the reports of the Medical Officers of Health."

The prospect does not seem to be much better in regard to the new houses which are being built in the neighbourhood:—

"In the new houses that are being constructed in the Staines Rural District, there is a lamentable neglect of elementary sanitary principles; and neglect in this matter is the more to be regretted, because these faults of construction must needs be so difficult to amend hereafter. Considerable areas have been laid out for building purposes, and a large number of new dwellings have actually been erected, in some places forming continuous streets. But no provision is made to secure these dwellings from dampness, nor for the efficient sewerage and drainage of the streets and houses, nor for a wholesome method of excrement removal, nor yet for the supply of wholesome water to the houses. In short, the new houses are being provided with the same sanitary faults as those that are found in the older houses of the district."

The effect of the general filthiness of soil and water in the Staines Rural Sanitary District, on the river in its neighbourhood is a matter which may concern others than those living in the district:—

"Large volumes of water course through the river gravel which forms the subsoil, and into this gravel are washed the contents of several thousand cesspools purposely dug in the gravel for convenience of discharge thereinto. The water thus befouled flows directly or indirectly into the Thames. . . . . At a short distance below this neighbourhood, on the southern bank of the river, are situated the pumping-stations of certain great London water companies. . . . . The discharges from each several case of typhoid fever in the Staines Rural District, if they find their way from the district cesspools along the gravel stream into the Thames, have the opportunity of 'specifically contaminating' vast quantities of the river water; so that nothing but the efficiency of the water company's filtration stands between the typhoid matter entering the river at Sunbury and the consumption of that typhoid matter by the water drinkers of half London. What is true of typhoid fever in this connexion is beyond doubt true for Asiatic cholera, so that cases of this cholera in the Staines Rural District might have disastrous results for the metropolis."

This passage lends additional emphasis to what we have frequently said on the matter of the London water supply, and should be read in connexion with what Mr. Binnie, the Engineer to the London County Council, reported on this point a short time ago (see *Builder* for April 18, p. 311, top of col. 3).

MR. JOHN F. ROURKE contributes to the February number of the Transactions of the American Society of Civil Engineers a short paper describing the progress that has been made with the Chignecto Ship Railway, now in course of construction between the Bay of Fundy and the Gulf of St. Lawrence. The railway, which is 17 miles long, consists of two lines of standard gauge, 18 ft. centres. The vessel to be transported will be placed on a platform of cars and supported by blocks along its keel and bilges, its weight being distributed over 240 wheels. The journey across the isthmus will occupy about two hours, two locomotives only being required. The hydraulic presses that are required to raise the vessels from the level of the sea to that of the railway are designed to lift ships carrying 1,000 tons of cargo. It is expected this line will be in working order by the summer of next year, and should this novel system of transport prove successful, we may expect to see in the near future many similar schemes carried out which are now held in abeyance pending the result of the experiment that is shortly to be made at Chignecto.

AN improved form of shield for tunnelling has been lately devised and patented by Mr. J. R. Lilliegirst, which we think would be found to work well in water-bearing strata, such as wet clay, sand, and gravel. The shield, which is of very simple construction, is forced forward by hydraulic jacks in the usual manner, but its form is such as to allow easy access to the material that is to be excavated, even when there is much water to be contended with.

HOWEVER beautiful it may be in itself as a design, the new western porch at St. Margaret's Church, Westminster, can hardly be considered a successful addition to the church. Hitherto the breadth of treatment of the whole façade formed a strong and pleasant contrast to the elaborate work of the adjacent north transept front of the abbey. The new porch destroys this completely, besides being quite out of character with the front against which it is placed, and having a "stuck-on" appearance, which is anything but pleasing.

LOCAL history is becoming much more studied, as the landmarks of the past get gradually effaced. Several parish histories have been written or thoroughly revised, by the aid of topographical collections in our public libraries. In that of Lambeth Palace is a series of books, pamphlets, and prints on the records of Kent and the diocese of Canterbury, to which important donations have lately been made, especially in a somewhat rare book entitled "The Enrichment of the Weald of Kent," by Gervase Markham, 1649. There is a letter of this industrious writer among the Lambeth MSS. His treatises on husbandry are numerous and well known. The above tract on the Weald was lately presented with other works by W. J. Harvey, F.S.A. Among the collection are two water-colour drawings by Paul Sandby of the once remaining gates to the city of Canterbury, besides several portfolios of interest to the architectural antiquary. This increasing series of Kentish antiquities has been of voluntary contribution and effort; and it is hoped that those who may possess duplicate engravings or books on the subject will add them to this portion of the Palace Library, and thereby increase its utility to students, who can examine the contents daily (except Saturdays) from ten a.m. to five p.m.

THE room in the Law Courts, opposite to the Bar Library, hitherto used as an arbitration room, has been fitted up in a rough and ready fashion as a Court, and it is intended to be used as such. This is characteristic of the haphazard way in which we manage these matters in this country. The room has but one entrance, and is up a long flight of stairs, and will be very inconvenient as a public Court. It would have been reasonable when the Law Courts were built to have erected at least one extra Court, or to have had the building designed so that more Courts could be added when required, without detriment to the form of the building generally. As it is, from an answer in the House of Commons this week, it is obvious that within a short time the Government intend to appoint another Chancery Judge, and thus the difficulty at the Courts will crop up again. Every year, indeed, shows more and more plainly the mistake which was made in adopting the plans from which the building was constructed.

A CIRCULAR which we received recently from Mr. Henry Holiday informs us that he has taken the step of superintending the execution of his own stained glass work for the future, instead of drawing cartoons for manufacturers to carry out. Mr. Holiday says, "Time has persuaded me that without a more intimate association of designer and painter it is difficult to obtain with certainty the highest degrees of beauty." Mr. Holiday intends to paint a good deal upon the glass himself, and to have what he cannot personally execute carried out in his own atelier under his own eye. Those therefore who wish for stained glass from Mr. Holiday's design will henceforth have to apply to him to produce the glass itself, and not only the cartoon. This step on the part of an eminent designer for glass is quite in keeping with the general tendency of the day, among the most earnest class of decorative artists.

THE *Ludgate Monthly*, a new magazine published at the modest price of three pence, opens with an interesting little article on "Ludgate and its memories," by Mr. C. R. B. Barrett. It includes a view, from an old engraving, of "Lud Gate in 1670," and illustrations of the old statues of King Lud and his sons, which have gone through a good many vicissitudes, and were last heard of at Hertford Villa, Regent's Park. The writer suggests that the Corporation of London should make some effort to find out and repurchase them.

THE exhibition of drawings by Mrs. Allingham, at the Fine Art Society's rooms, is of the same character as those which have preceded it, and of nearly equal charm if the proportion of highly-finished works is rather less than before, on the other hand there is a beauty of colour and composition in some of the drawings in the present exhibition which seems to surpass anything in the previous collections of her drawings. Among those which struck us particularly for their harmony of colour are "The Little House under the Hill" (15); "Sandy lane near Witney" (19); "By the Old Cottage" (22); a drawing with a bare foreground which must have been rather a difficulty; "Cottage at Bowler's Green, Surrey" (43); "Under the old Elms" (66), a remarkably sunshiny work with the shadows of the trees on the fresh grass; and "A Cottage" (79), one of the smallest but one of the most beautiful works in the collection. "A Visit to Grannie" (24) shows a portion only of an old brick cottage with large mullioned and transomed windows with its garden in front; the bit of cottage architecture shown is very interesting. In "Master Hardy's, Sandhills, Witney" (31) a long half-timbered cottage groups admirably with the surrounding trees. "Farringford Dairy, Isle of Wight" (54) shows a very characteristic bit of cottage architecture, with the thatched roof coming down in capes and headlands between the dormer windows. "Cottage near Pinner" (58) is a study of the old-fashioned formal cottage front garden with clipped box-trees in "shapes"; "Hollyhock Cottage" (61) is noticeable for the charm of composition and for the expressive character of the small figures introduced. The artist has been trying one or two new subjects. "Sea Grass, Eastbourne" (10) and "At Low Water" (14); and there is a study of the "Fair near Shere, Surrey" (86), with a motley crowd of people depicted, which is quite a new kind of subject among her works. Among the small half-lengths of figures of young cottage girls, perhaps "Jenny" (67) is the most taking in character and colour, but all are happy examples of that rustic refinement which perhaps owes a little to the artist, but which is more often to be met with in some of our country districts than those who do not look for it would perhaps be ready to expect. It is one of Mrs. Allingham's claims to our gratitude that she has preferred to see and to reproduce the best and sweetest instead of the most uncouth types of English peasant life.

THE accompanying sketch represents the old "Raven Inn" at Battersea, which we understand is now being so transformed in the course of repair and alteration that little of its old physiognomy will be left. The old inn must have stood at Battersea long before Lord Bolingbroke met Pope and other literary



"Old Raven" Inn, Battersea. From a Sketch by Mr. C. H. Marquett.

nds in the "Cedar Parlour" close by. The , which had a tap-room and a "chimney k," in which six could sit by the fire, was vourite haunt of the Battersea asparagus- wers and market gardeners, about whom ele wrote so lovingly. No doubt the aven" was noticed,—perhaps sketched, y Turner, who loved to paint the sets over Chelsea Reach, from the ry of St. Mary's Church close by. recent years the "Raven Inn" has been a ourite haunt of rowing men. The builders o are rebuilding it found it "propped, m-eaten, and ruinously old," and, but for e wonderful shoring, it would have abled about the ears of its present pro- tor. Before the days of "reformed tries," all the business of the parish was lly transacted at the old inn. Here the rchwardens, overseers, and vestrymen in a club called "The Ravens," but which irreverent called "The Forty Thieves." the new building glazed bricks, leaded ats, and an old sign will preserve some of the racteristics of a famous old inn. The new k is being carried out under the direction Mr. Yetts as architect, Messrs. Laster & being the builders.

A COLLECTION of drawings by M. Jules Lessore, which are now on view Messrs. Buck & Reid's in New Bond-street, lude some sketches about Plymouth, exe- ed in a broad free manner, and with some ividuality of style. "The Pool" (18) is a sketch, slightly marred, to the architec- al eye, by a want of perpendicularity here d there in the lines of the buildings, which ttle care should have avoided even in a id sketch. "Shipping at the Coal Stairs," lymouth Quay," "The Barbican," are ong the best of the set. Among the other wings is a powerful one of "Notre Dame, ris," rather too cold in tone; and three all sketches at Rotherfield are interesting l picturesque; Rotherfield Church es- ially, a very good little composition, worth rking out in a more finished drawing.

DETAILLE'S large painting exhibited at Messrs. Boussod & Valadon's under the le "Vive l'Empereur" represents a charge the 4th Hussars on some occasion not ntioned, and seems rather obviously in- ded as a challenge to a great work of eissonier's on a similar subject. The ominent incident, which in fact to a great tent makes the picture, is the figure of the mmanding officer in front on a magnificent grey horse; this is full of life and energy, and is one of the finest things the artist has done. The difficulty of representing a line of galloping horses (in the rear) so as to convey the idea of rapid motion does not seem to have been quite mastered, and on the whole the work is rather disappointing as a picture; possibly the rather dull light of last Saturday afternoon was against it. The picture has been acquired by an anonymous purchaser for presentation to the Luxembourg, where it is ultimately to find its place.

THE "NEW GALLERY" EXHIBITION.

THE New Gallery is practically the continuation of the Old Grosvenor Gallery, but its contents are not so much confined to one school as was the case in the earlier days at all events of the Grosvenor; there is more of a mingling now of transcendental pictures with those that are of common earth. The leading work, as to size and importance, is however of the transcendental type, Mr. Burne Jones's large painting "The Star of Bethlehem" (63), painted for the Corporation of Birmingham. There is something almost grotesque in the association of Birmingham with a picture of this type, though it is to the credit of the Birmingham Corporation, no doubt, that they should wish for and commission a work of ideal art, and we presume that in the representation of the offerings of the Magi (for that is the real subject) there is some symbolical reference to the idea of Birmingham offering her wealth at the shrine of some higher ideal. The picture, a very large water colour, represents the Virgin and child on the left seated under a thatched shelter which makes a rather undecorative object, and on the right the three visitors, in gorgeous robes the decorative detail of which is a study in itself; one of them is represented as an Ethiopian or some similar race, his dark colour coming in well in combination with the rich clothing and jewellery. Between these and the Madonna is "the Star in the East," represented by an angel with stiff upright figure and feet pointed straight down to the grass, over which it seems to float, and holding carefully between its two hands the star. In one sense this may be called perhaps a pretty fancy; from another point of view we fear it illustrates what the whole picture illustrates, the essential childishness of Mr. Burne Jones's conceptions of scriptural events or parables. In a decorative sense the picture is beautiful; in an intellectual sense it is a kind of thing only to please children, a conception which would be rejected with something like scorn by all robust minds. Mr. Burne Jones's other work, "Awake, O North Wind, and Come, thou South" (34) is another idealistic painting of abstract conceptions; the standing figure in robes of dark blue, in the foreground, representing the speaker in the sentence quoted, the owner of the "garden," is a pure delight from its grace and beauty; the figure of the wind is a repetition of a type we have often seen from the artist before, a figure supposed to be flying through the air, placed in an oblique position and perfectly rigid. No posture can be more at variance with the idea of flight, or more rigid and angular in effect as part of a composition of figures: it is a convention which seems a favourite one with the painter, but the charm of which we entirely fail to understand.

Mr. G. F. Watts's picture of "The Nixie's Foundling" (9), which should rather be called "The Nixie's Find," is an exquisite colour dream of a half-length figure of some fairy being who has found a rich necklace and is admiring it with all the rapture of a child of earth. The beauty of the work, which the painter has perhaps never surpassed in its particular way, lies in its exquisitely rich and delicate colour and the absence of all materialistic representation of flesh and blood; it is a figure idealised into a kind of prismatic region both of colour and conception. Mr. Watts's other work, "The Deluge—the Forty-first Day" (238) is an attempt to convey the effect of a great burst of supernatural sunshine breaking first through the mists and shining on the waters. It is powerful and impressive, but it is an attempt at something beyond the power of painting to give adequately.

Mr. Tadema's contribution, "Love in Idleness" (96) is in its special characteristics one of the finest of his paintings, and will probably be esteemed his leading work of the year. It is a larger picture than is usual with him, representing a high marble-paved terrace on some Ægean island, backed by a balustrade sculptured with bas-reliefs; in front is a peculiarly-designed marble fountain in which Cupids presiding over waterspouts in niches, alternate with panels with fluted ornament. Two figures are on the terrace, one lying down, the other seated, with her bright head relieved against the intensely blue Mediterranean water; on the horizon, over the balustrade, sparkle in the sun the distant cliffs and temples of another island. As a representation of a moment of antique life the picture is superb, as far as the surroundings of the figures go. The one drawback, too often found in this artist's remarkable works, is that the figures are neither very beautiful nor very interesting.

The remainder of the important figure-pictures are chiefly portraits, but there are three or four other paintings of the ideal class. These include a small but charming little work of Mr. Poynter's, "Knuckle-bones" (11), a couple of nude Greek maidens playing with bones while a draped figure in the window-seat looks on. There is a little want of delicacy in the texture of the flesh, and the red shadows on the side of the figure on the left seem too heavy; but it is a very pretty little work. Mr. Waterhouse's "Circe" (153) is one of the many failures of artists in representing this strange creation of ancient myth; there is an insolence and *abandon* about the seated figure, but she is not the goddess. Mrs. Swynnerton's "Cupid and Psyche" (161) represents two young people of commonplace physiognomy acting the parts; Cupid has got a splendid pair of purple wings which form an important element in the picture, but his face is that of an ordinary schoolboy. Painters are sadly too fond of reducing poetic myths to mere prose. Mr. Richmond's "Amor Omnia Vincit" (176) does not err in this way; it is purely poetic both in the personages and in the lighting of the scene; we do not see the point of the title, as the picture might be called "Venus Preparing for the Bath," but it is an effective work and treats an ideal subject in an idealised manner.

Of the portraits, the finest to our thinking, perhaps the finest picture in the room, is Mr. Shannon's "Miss Clough—Principal of Newnham College" (61), a noble portrait, effective in colour without any straining after effect; the head is fine and dignified in expression and solidly painted, the whole thing is a model of what a portrait should be, a representation of the personality of the sitter, without forgetting artistic effect. Too many portraits of the new school (some in this collection) impress one with the idea that the first aim has been to make a telling decorative effect of colour, and that the personality was a secondary matter. Mr. Sargent's object in portrait-painting seems to be to make his sitters ridiculous, and to throw aside ostentatiously all attempt to produce a pleasing artistic result.

His "portrait" (56) of a young woman in white, with hair unkempt, stuck sitting down facing the spectator exactly in the middle of a background of carved wainscotting, is a work we can only call offensive both in regard to art and good taste. How any lady can consent to be painted in such a manner is a mystery; but unfortunately there are ladies, as well as artists, who will do nearly anything for the sake of singularity. "Miss Nina Webly" (2) seems to have decoyed Mr. John Collier into painting a miserable lanky portrait quite at variance with his usual healthy and manly style, which is better represented in his portrait of "Miss Mabel Pollock" in dark outdoor dress and hat (19); a very spirited performance. Other noticeable portraits are Mr. Orchardson's of "Professor Nichol" (50) and Mr. Herkomer's of "Lady Helen Fergusson" (167) descending the garden steps, her head and white dress relieved against the mass of ivy on the house behind; a fine dignified example of that class of portrait (so fascinating when well done) which aims at giving, as it were, a momentary glimpse of the sitter passing by, or occupied about some incident of everyday life, instead of a formally arranged portraiture.

Among landscapes we may best class Mr. Philip Burne Jones's remarkable picture of "Earth-rise from the Moon" (190). We stand in the bleak, desolate, and airless lunar landscape, covered with extinct volcanic cones casting black shadows, and over the rocky horizon rises the large disc of the earth with the softened yellow radiance due to its atmosphere, which makes a faint halo or corona round the disc; the outlines of the continents and seas are distinctly seen. This is a powerful and really imaginative picture, and at once places its author on a higher level than any of his previous very clever works have given him. It is a pity that he should have marred the realism of the scene by the introduction of a skeleton in the foreground, apparently similar to a human skeleton,—at least the arm with its radius and ulna is distinctly made out, and a thigh-bone with the trochanter process is also visible. Now astronomers would tell the painter that if, as they fully believe, life is now dead in the moon, it must have been so for a time far too great for any remains of that life to exist now, except in completely fossil form; and biologists would probably tell him that it is in the highest degree improbable that biological development should have followed the same course in the earth as in the moon, in details at all events; that it should do so would be one chance out of almost infinite possibilities. He had better have left the skeleton alone. Among terrestrial landscapes are two fine seapieces by Mr. Henry Moore (6 and 16); a snow picture by Mr. Mark Fisher (21), a new field for this painter; "An April Day" (15) by Mr. W. S. Jay; "Autumn" (62), by Mr. J. W. North, "the light that never was on sea or land," certainly, but very beautiful nevertheless; "Midsummer" (126), by Mr. C. W. Wyllie, a beautiful Lower Thames picture full of sunlight; "October" (126) by Mr. Albert Goodwin; "Daphis" (140) by Mr. Alfred East, a scene with an ancient town on the other side of a river, white in the hazy light; "Open Fields" (146), by Mr. Thorne Waite, a genuine bit of breezy English landscape; and The Setting Sun" (157) by Mr. Adrian Stokes, a powerful little landscape completely French in feeling and treatment, but none the worse for that; a curious æsthetic contrast to the last-named work.

Mr. Nettleship's "Flood" (145) is a powerful work representing a lioness and cubs carried down a rapid on the stems of trees, the head of the animal is very fine, but the effect of light seems rather sensational. A curious instance of the disregard of painters for truth of architectural detail is shown in Mr. Spence's "The Last Bar" (260), where the classically draped figures are seated on a marble wall carved with Classic and purely Renaissance detail mixed up together. As another criticism we may observe that there was no such thing as a "bar" in music until somewhere about the beginning of the sixteenth century.

Among landscapes in the small (south) room should not be overlooked Mr. Hope M'Lachlan's curious but original and poetic work "The Thrush" (232), and a beautiful and delicate little landscape by Mr. Poynter under the title "Playtime" (219), a scene looking over a Sussex village, with a group of boys playing in the middle distance.

LETTER FROM PARIS.

Some political critic once made the remark that "a Radical can always find another more radical than himself." This seems to be equally true in the world of art in Paris, which has shown during the last few years a continual succession of jealousies and recriminations.

From the first quarrel arose the Champ de Mars exhibition, which was hailed by all the malcontents and ambitious but unappreciated persons as a kind of promised land of justice and freedom. But after only one year of existence this second Salon has been the scene of a new schism. We are now, alas! threatened with a third Salon, that of the "rejected." It has already assured itself an asylum in the Palais des Arts Libéraux, which M. Alphand, in his desire to find a use for the old exhibition buildings, has handed over with an easy generosity. If the project is carried out, we shall have the melancholy spectacle of two rival Salons on opposite sides of the same ground, and those who have been "pilled" at the Champs Élysées and the Palais des Beaux-Arts will take refuge with the "independents." It is not the first time this kind of thing has happened. Under the Empire, when the official Salon was in the hands of the Government, the rejected painters collected their works in a neighbouring locality. People amused themselves a good deal at that time with the unreal landscapes and fantastic portraits which have now become current coin in our exhibitions. It was from this attempt that Impressionism, so much in fashion now, first took its rise. The future will show whether this last rebellion will in turn give rise to some new fashion, before which the violent greens of MM. Pizarro and Lisley will ere long appear as much "played out" as do now the pictures of M. Stenben and M. Signol.

While awaiting this new mystery, let us look in at the Galerie Georges Petit, where the Pastellists have again made their annual show of talent and "virtuosity." M. Adrien Moreau exhibits a series of sketches of rural scenes, sweet and inviting in colour; M. Duez reproduces with clear tonality the shores and coast of Normandy. M. James Tissot shows his very original and personal reminiscences of England. M. Forani takes us into the "coulisses" and the doubtful side of society. M. Billotte is still the melancholy painter of the desolate places on the outskirts of great towns. M. Lhermitte continues to trace, with his vigorous crayon, the episodes of country life, while M. Montenard entrances us with the sunny landscapes of Provence. The portraits of MM. Doucet, Machard, and Boldini, the Parisian scenes of M. Jean Bérand, the nude studies of M. Gervex, the curious colour experiments of M. Besnard, finish the summary of this exhibition, always an interesting and clever one, and never more so than this year.

One cannot say so much for the exhibition improvised under the title of "Poil et Plume," by a group of literary men anxious to show that they can handle the pencil as well as the pen. With the exception of the sketches of Victor Hugo and of some attempts by Arsène Houssaye and the brothers de Goncourt, the collection is little better than ridiculous. The organiser of it, M. Emile Bergerat, a writer of great ability and a detestable painter, has flooded it with his productions. The thing is an amusing joke worth making note of, and that is all, in the artistic sense. It ought to be added that the exhibition is for the benefit of a charity, and perhaps the end justifies the means. We may mention also an interesting exhibition of the marine paintings of M. Auguste Flameng, a series of impressions of travel, spirited sketches rapidly caught and noted in full daylight.

At the Hôtel de Ville there have been exhibited, the last few days, the cupola paintings for the Galerie Lobau. The premium in this competition has been awarded to a charming composition by M. Picard, who was assisted in the decorative part by a young architect, M. Risler. M. Boureau has obtained the second prize. M. d'Espouy, the architect, who intended, in case he succeeded, to collaborate with M. Raphaël Collin, has only obtained the third prize. M. Dubufe, in spite of his high abilities, has been classed fourth, and M. Moreau Nèret is the fifth. The public judgment has ratified that of the jury in favour of M. Picard, from whom we may expect a fine and decorative treatment of the cupola.

With the spring commences the annual appearance of apocryphal pictures. Two years ago we had the false Raphael cartoons exhibited at the Galerie Petit, and which a Musical covite impresario has just re-edited, so to speak, affirming their superiority to those at Hampton Court. Now the discovery is announced, a the shop of a dealer, of a Leonardo da Vinci or, at the least, an Andrea del Sarto. The Government and the experts are occupying themselves about this work, which will probably have the same history as the pretended Rembrandt of Pecq, now returned into the obscurity from which it ought never to have emerged.

The new Salle des Colonnades at the Louvre reserved for the exhibition of M. Dieulafoy's objects from Persia, has just been opened. In the centre is placed the "Apadana" or throne room of Artaxerxes Memnon, restored to a scale of one centimètre to the mètre, with its porticos, columns, and central road ornamented with towers, leading to the great throne-room of the king. The exhibition, very well arranged, will be found of great interest.

In the architectural competition at the École des Beaux-Arts the jury have awarded second medals to M. Delahaye, pupil of M. Guadet; to M. Bonsarens, pupil of MM. Daumet and Girault; and to M. Valentin, pupil of MM. Gerhardt and Redon. In the section of painting the ten competitors admitted have received for subject an incident from the fable of Philemon and Baucis thus stated: "L'oie vint de se réfugier dans les jambes des Dieux, ce qui empêcha leur hôte de la tuer": an odd choice certainly, and one pities the young students compelled, in the silence of their academic cells, to seek inspiration from so unpromising a subject.

The Salon of the Champs Élysées will have opened before these remarks are published, and will be considered more particularly in a future number. Among its contents we may mention the monument which the pupils and admirers of César Franck propose to raise to the memory of the celebrated organist and composer.

We may conclude here by reference to the great loss which the world of art has sustained by the sudden death, at the age of fifty-seven of the eminent sculptor Henri Chapu. He was born at Mée (Seine et Marne), and studied under Pradier and Duret. He obtained twice the second "Grand Prix de Rome," and the "Premier Prix" in 1855. He made a brilliant début in the Salon of 1863 with his "Mercury inventing the Caduceus," which is now at the Luxembourg. Since then his works have always taken the highest rank. His "Jeanne d'Arc à Domremy" is one of his finest productions. We may recall also the figure of "Jeunesse" which decorates the monument of Henri Regnault at the École des Beaux-Arts, the monument to Bishop Dupanloup, and the charming figure of a young girl gathering flowers, which was commissioned by the Duc d'Aumale for the park at Chantilly. During his career Chapu had obtained all the honours open to an artist; the third medal in 1863, two medals in 1865 and 1866; the "Médaille d'Honneur" in 1875 and 1877, and, the same year, the biennial prize of 20,000 francs awarded by the Institut. He was member of the Académie des Beaux-Arts since 1880, and officer of the Legion of Honour since 1872. At a time when French sculpture counts so many illustrious names Chapu had the right to a place among the first, and his work united the highest poetry with the greatest power in anatomical modelling.

Such as he was in art, such his friends found him in private life. He was of a nature simple, upright, modest and sincere, keeping apart from cliques and coteries and from the quarrels of parties. He will leave with all, in these times of indifferentism, the pleasant memory of an artist really believing in his art, loving what was beautiful, faithful in his friendships, and always kind to young artists, who loved him much. He leaves several important works unfinished, among others a bust of Duc, the architect, intended for the Palais de Justice, and two marble statues, "Le Chant" and "La Moisson," commissioned for the decoration of the Hôtel de Ville.

Civil and Mechanical Engineers' Society.—Mr. W. Lee Beardmore, A.-M.Inst. C.E., on the 29th ult. read a paper before a meeting of the Civil and Mechanical Engineers' Society, held at the Westminster Palace Hotel, on "Compulsory Registration of Certain Buildings as to their Sanitary Efficiency." The chair was occupied by Mr. R. Nelson Boyd, M.-Inst. C.E., the President of the Society.

METHOD IN COLOURING.*

IT augurs well for the future of architecture that the study of colour is receiving more attention among architects than formerly; and the last meeting of the Institute was full of promise.

Among the great architects of recent times colour has not been a strong point; indeed, in many cases, it is quite evident that a sense of good colouring has been entirely wanting.

The knowledge of colour and power to apply it, have not been regarded as so essential in general practice as other capabilities, such as structural power, knowledge of style, &c. These qualifications are more common than the colouring faculty.

Among all artistic workers it is evident that form-development is of easy growth; compared with it, the true colour feeling is a rare thing, and on this account not only have many architects been at a disadvantage in dealing with colour, but their efforts to get good colour from others have, as a general rule, been discouraging.

Speaking broadly, there does not seem to be much scope for colour display in our external work, but this is largely owing to the colour limitations of the materials that are suitable for our buildings; and we can never forget that ours is a very different climate from that of Italy, for example, where beautiful marbles can be freely used, without the fear of their being soon destroyed by damp, frost, and the deleterious atmosphere of our great workshop towns, cities, and even country suburbs.

Artistically, it will, perhaps, be admitted that pictorial effects in our large cities, and in general landscapes, as far as buildings are concerned, owing to our variable atmosphere, depend more on mass and grouping than on colour, provided the prevailing tone be not objectionable.

I need only call to mind the effect of a picturesque building, nestling among trees, with the quaint mass of gables, chimneys, and towers rising against the evening sky; and in our large cities, to the pictures, perfectly fine and mysterious, which are occasionally observed in winter time, or on summer mornings and evenings, when the sun with his warm complementary light is breaking through the mists or fogs.

It may be said, then, that there is no great call for effort after colour display in our external work. Mass, proportion, and play of mouldings, carvings, and other subordinate enrichments rendered in suitable materials, for the most part unimportant in colour, seem to give a generally satisfying effect.

Before everything else it must be stated that what we lack in this country is sunshine, or, as Professor Richmond put it the other evening, we want light.

Our northern regions are not favourable for the development of strong or fine colour treatment. The pitch of sky and surroundings is for the most part low in tone. The force of what I am saying must at once be apparent to those who are familiar with the "sunny south." In occasional dull weather in Venice, for example, such weather as we have good spells of at home, the whole place is far from striking as regards colour; but, when the sunlight breaks out, the display is perfectly enchanting, all seems to have been arranged to harmonise with the splendid glow which is cast over everything, or, as I think Mr. Waterhouse has it, the sun-glow harmonises everything.

While our thoughts are towards Italy, special reference might be made to Pompeii, which shows a colour development quite unique, and bears the strongest testimony to what is being urged, that sunlight is the great factor in calling forth and strengthening and refining the colour power.

Another consideration is, that in our desire to obtain the pure colouring of nature, we are limited by the fact that we have to work with pigments, which are *matter*, and not light; and we cannot, except in a limited way, work by the scientist's theories, which are based on the laws of light.

The spectrum shows to us that the primary colours in a ray of light are red, green, and violet. But in our working indivisible primaries, viz., red, blue, and yellow,—we have to accept a lower scale of colour than in nature, and this must be patent to all who have experimented with the colours in their right proportions on a revolving disc, when, instead of white, we find a dull grey, and the best we can attain to in aiming after natural effects is to render all in right relation.

Familiar illustrations of this will be found in the works of great painters, for example, Rembrandt in figure painting, and Constable, Corot, and Rousseau in landscapes. In their hands the main point in the subject has, as nearly as possible, the natural value given to it by juxtaposed tones, which are unnatural and greatly exaggerated.

As I am addressing an architectural association, it is of importance to note that architects are chiefly dependent on others for the final results of colour arrangements, being unlike artists, who have nothing between their inmost thoughts and the fullest expression of them on the canvas.

The disappointments and worries that arise through mishaps in manufacturing processes, and the handling of the brush and colours by workmen, are matters of constant experience.

It cannot be denied that in this connexion a great deal has to be done in the way of educating our working decorators before good work can be got.

In the process of painting, several coatings are generally required, and unless these are skilfully applied the result in the finishing is altogether disappointing. It is a common thing for a directing artist to be told, when he expresses his disappointment after the colouring has been coated for the last time,—"Well, sir, it has gone down in the flatting," or to find that the ground is shining through, or something else which indicates either a total want of colour feeling or want of skill in handling the various stages. A few broad colour principles clearly grasped, and the practice of insisting on seeing what is actually to be applied, to achieve the final effect, will save much disappointment.

In internal work, white, or white slightly tinted, has been much in vogue. This fashion can only be justified because of the cleanly appearance it gives, and the ease with which the British workman can do it, but anything near white is bad, from a decorative point of view.

A more hopeful state of things has been showing itself of late years in the low-toned combinations which many architects and decorators have indulged in. They remind one of many of the modern pictures of the French school and of the Low Countries, or some of the impressionists, which often strike us as being very easy of production. One cannot well give offence if the low scale is adhered to; and while in good hands fine results are achieved, generally speaking the most favourable criticism from a colourist's point of view is that they are unobjectionable. One serious result of working in a low scale is, that in a very few years the bloom will have gone here and there, for colours will alter on the walls, floor, and in the cloth stuffs, and fustiness will be the result.

Every artist has to lay his account, for better or for worse, with the effect of time on his work, and if the full wearing quality of each coloured surface or material could be ascertained, it would be desirable to arrange the colouring on a crisper key than would be desired, so that the mellowing influences of time and the accretion of dirt, which the President of the Royal Scottish Academy says is an accompaniment of Art, may complete the charm intended. Mr. Frith, once talking about this subject, mentioned that Lee the landscape artist painted in cooler and crisper colours than he would have done, leaving time to do its mellowing work. One would think that some who supply our finest wall papers arranged their colours with the same object, for the effect of them is often much too sharp.

It may be interesting to some to illustrate, in a way that lies ready to my hand, the effect of time upon a particular coloured surface. Here [showing specimens] is a sheet of modelled canvas. One portion of it is of toned gilding, the next is lacquered to represent the effect of age, and the third section represents the same mellow lacquer scumbled over with a neutral colour which fairly represents the effect produced by the dust of ages. In looking at the splendid examples of colour in our National Gallery, the desire to reproduce such effects is, of course, natural; but, as was plainly said by Sir John Millais some time ago, the charm is greatly accounted for by the effect of time, but the transcendent power of the authors of such work is felt the more their work is studied. I had the pleasure recently of spending some time in the early morning hours in attempting to match exactly what I thought the finest colours in several pictures. The result of my studies I put before you. They will show you that they are not in themselves strong or very beautiful in colour, and must require the juxtaposition of other colours to give them their true value. Nothing could more clearly demonstrate than these examples that good or bad colouring is mostly a question of relation, and that a colour that looks well in one place may be quite unsuitable in another.

To an architect, perhaps the greatest surprise he could have as to the artistic value which age imparts was shown when the new black and white marble front of the Duomo at Florence was almost completed, as it showed itself against the mellowed colours of the dome. The effect was harshness itself.

In our street architecture, we, in our generally backward state as regards colour, will be subject to much that cannot but be objectionable, because of the rival interests of neighbours along the same street or avenue. On this line of thought I may relate an amusing incident of which an Academician told me. On varnishing day he saw Turner and David Roberts sitting side by side, working each at his own picture. Roberts' picture was generally a neutral one, and Turner's was on a higher scale. The two men were silent; but Turner, with evident enjoyment, was intensifying his sky, much to the annoyance of Roberts, whose side-glances were very frequent. At last Roberts broke the silence by remarking, "Aren't ye makin' that very blue?" The inference from this is plain enough.

An immense and permanently satisfactory impetus would be given to colour development in our buildings, if the yellow terra-cotta which is now being employed were to become more general. Its sound qualities as a building material have, both for town and country, been well attested by time, but its imitation of yellow sandstones should not be the ultimate aim of the architect, or of the producer of it. Firmer tints of yellow could be employed which would be more of a complementary to the general bluish grey and green of all around us, and would be forcible, although never offensive, if placed beside cement, stone, or ordinary brick-work. The use of red terra-cotta, also, is most welcome, and, either in the mass or for heightening the effect of the yellow, is very valuable.

I venture to call attention to a building which has just been erected in a smoky city, and is a welcome contribution to the revival of coloured effects in external work. The Messrs. Templeton, of Glasgow, in building a large extension to their carpet works, resolved that, as the site was most favourable, they would give an architectural expression to their building which would be in harmony with the high standard they aim at in their fine carpet productions, and by the employment of Mr. Leiper as their architect, a result has been achieved which all must be glad to see. The design is early Venetian in character, and the colour-scheme is chiefly based on the three primaries got by red sandstone, red bricks, and terra cotta, and the yellows of terra-cotta and soft glazed bricks, some of them inclining to greenish grey, while the blues are of Rust's mosaic, and are introduced in panels in the window-heads. Soft olives and dark blues, also, are introduced into window shafts of Maw & Co.'s work.

Every colour scheme should be prompted by a distinct idea, sympathetic, and of such a nature as to produce more or less of pleasureable excitement. A place of public entertainment, where we do not usually spend more than a few hours at a time, might be decorated on a high scale in keeping with the generally prevailing feelings of a public audience. A place of worship, naturally demands, on the other hand, an air of impressiveness, restfullness, and want of any distracting elements. Our houses should not be subject to any absolute rules, except that they be suited to the temperament of the occupants. In small apartments quiet colour symphonies are best, but if it please us better let us have a Louis XVI. or Adam Chamber with as much-restrained delicacy of treatment as may be desired, or we may have a room arranged as the setting of elegant litter collected in many wanderings or drawn from Japanese or other bazaars, and so with all our other apartments. If the house is intended for the home of a toiling man and his family, a feeling of rest and cheerfulness should prevail, but where hospitality is

* From a paper by Mr. W. Scott Morton, read before the Architectural Association on the 24th ult., as elsewhere mentioned.

intended to be freely dispensed, a higher pitch of colour is more appropriate, as being more in keeping with the spirit of the indwellers, and more to the pleasure of temporary visitors. The influence of colour on the spirits is worthy of attention, particularly in the case of those who are of a sensitive disposition. I know of a case in which a delicate person was perceptibly improved by being moved into a room which was specially decorated for her. This subject has been studied to very good purpose by Dr. Clouston, who is the able head of the greatest lunacy asylum in Scotland.

When Mr. Bond, to whom the *Pall Mall Gazette* has given the title of the "Opal King," arrived in this country, he was a stranger, and was taken suddenly ill. He lay for weeks in St. Thomas's Hospital, and, during his lowest moods, he felt an indescribable ill will towards one nurse, but the ministrations of another seemed those of an angel. He accounted for this afterwards simply from the fact that one was always dressed in black and the other in white or light prints.

Among our working decorators, and more frequently the public who employ them, there is only the most vague notion of what is to be done when a decorative scheme is begun. "Know what you have to do and do it," is a good maxim. It helps greatly towards a good result if any decidedly beautiful thing or sentiment is set before one at the starting-point. For example, if a scheme suggestive of spring is proposed, does not the mind at once find itself in an apartment with an exposure to the morning sun, with the large spaces of cool tints of greyish green or yellow, and choice bits of soft whites, yellows, lavenders, and hypatica and saylla blue tints. Or there may be the sentiment of autumn desired, which could be well expressed in a room of a northern exposure, where the glow of colour on field and trees against the grey-blue distance and purple hills, could be so rendered as to make an unattractive room speak of fulness, contentment, and homeliness.

Many other suggestions in this direction will readily occur to all who care to pursue this line of thought.

In the disposition of colours in various apartments communicating with each other, much can be done to give value to each treatment by alternating the lightness and depth of the colour pitch and by the use of complementary colour schemes. The eye is soon satisfied with a colour, and seeks rest in the opposite of that colour, and if, say, from an apartment decorated in soft reds, golden browns, and olives on a quiet scale, you go to one tinted in pearly grey greens, soft yellow, and rosy tints, the effect is always pleasing; and, if the scales be properly balanced between such apartments, the pleasure of returning from the brighter room after a little while is also manifest.

For interior work, when the proportions are carefully designed by the architect, the utmost care is needed in the colouring, and broad masses only, distinctly readable, should be allowed, so that the full expression may be given to the scheme; but if in cases where the proportions are sought to be altered, much can be done by the use of advancing or retreating colours to alter these.

But in the treatment of large rooms especially, a sense of scale and fitness must always be present in our colour efforts. A word of caution is necessary at the present time, because of the profusion of well designed and richly coloured decorative fabrics. The producers of carpets, silks, cottons, and woollen stuffs, and all kinds of wall decorations, strive to place before their buyers such goods as will impress them, and it is often observed that when inexperienced men make an effort to obtain a rich effect the result is such that you turn away in weariness and satiety.

Simplicity and readableness in colour design always characterises the work of the man of power, and if a definite idea is grasped, whether the subject embrace many sections or be a single object, the clear expression of the designer's mind should be brought out. Much care is evidently required in the general design of the architect, so that the full value of the final coloured scheme should tell as the climax of his aim. One does not need to look long among our public buildings for evidence to prove that much costly work is thrown away because of defective conditions as to situation and lighting; and, if the full measure of study were bestowed on what might be termed the focussing point, much expense in tiresome elaborateness might be saved, and a suitable inducement offered instead, to the skilled designer who would readily, from the simplicity of the *motif*, enter into the architect's ideas for the production of a choice example of his work.

One all-important consideration in colour schemes is flesh colour; its value in all its expressions as a colour factor is manifest in all the great picture-galleries. But my point now is, that flesh colour ought ever to be considered in one-colour schemes. I recently asked a distinguished artist his opinion as to a particular colour for decorative purposes, and he at once laid the coloured fabric alongside the back of his hand. This suggests a very ready way of helping decorators to determine whether a colour is right or wrong. The outrageous colour distractions amidst which we have often to mingle with our fellow beings would soon greatly diminish if this simple rule were kept in view. The very fact of flesh colour being an important element of all the greatest work of the past, is proof that it can always be considered, and yet room be left for endless variety of effect.

All decorative schemes which have to be associated with pictures, bronzes, statuary, &c., require special treatment. These objects are much more valuable than any merely decorative arrangement, and their setting should be such as to bring out their full value. One sees often, in prominent positions too, grievous transgression in this. I have in my mind a reception room in one of our most fashionable buildings, where there are some celebrated pictures, some of them of a rich mellow tone, but they are greatly injured by a wall paper of a generally cold effect, and with a strong wave line through it.

It is a safe rule in arranging a background to strike the general middle tint for depth, either for old masters, modern oil paintings, water colours, or etchings, and for a sculpture hall, a colour sufficiently clear to assimilate with the white, and of a tint to catch the colour of the transparent effects and also the shadows of the marble.

It will readily occur to every one of good judgment that a perfect feeling for the style of architecture is needed in the application of colour, as the style must distinctly control it. A study of the Grecian polychromy teaches useful lessons for severely classical work, and the nerve and breadth of the best Gothic decoration—and the strong intellectual handling of the early Renaissance, are fraught with many useful hints. The Alhambra work is peculiarly interesting, because of the use of the primaries with gold, white, and black. These in themselves are difficult to harmonise, but being applied on modelled surfaces, a great variety of neutrals is thus obtained from high lights, shadows, and reflections, which greatly qualify the strong colours.

The texture of the surface to which colour is applied is a matter of paramount importance. The *thin* effect of a smooth surface is felt by all artists, and a restfulness and colour charm is awakened by a textured surface, but clearly the colour tone is lowered by the texture. This you will see by placing alongside examples of wools in ordinary yarns, and the same woven into velvet material. It can also be seen in a very marked degree by comparing a plain gilded cardboard with a piece of plain gilded canvas, and this can be carried further into various degrees of broken, or moulded surfaces, as in the examples of modelled canvas before you.

There has been an interesting development in the United States of textured work, in rough, plain plastering, but with the surfaces slightly cast about with the finishing float, and it occurs to me in connection with this to mention the name of Daniel Cottier, who was, in my humble opinion, one of the very first decorative colourists, but whose career closed suddenly on the 5th of this month in Florida. In the work of Colin Hunter, one of our sea painters, texture is a very noticeable feature, and it tells very powerfully in his hands in giving a luminous effect. On one occasion, being with a number of artists in his studio, a discussion arose during Mr. Hunter's temporary absence from the room as to how the trick was done, and some ventured the opinion that most was done by the palette knife.

The method of lighting an apartment affects the colour greatly; and, speaking of texture, it cannot but be said that the usual top-light of our picture galleries is a trying one, chiefly because of the question of texture just referred to. Often, to avoid the glare from the reflection of the roof, pictures have to be tilted forward, and consequently the whole tone is lowered. Light, falling as near as possible at the angle at which it falls in an artist's studio, should always be arranged where practicable for pictures. The introduction of stained glass into any apartment at once alters the colouring of it, and it is scarcely necessary to state that if stained glass is an important element in any interior there is little need for anything else, unless it be but an aid to the splendour of that powerful decoration.

As shining surfaces reflect the light thrown on them, when the light is ordinary white light, the effect on colour is, as a rule, most hurtful, but in the very common lustreless finish of "flatting" there is the almost certain danger of the loss of bloom in colour. This is very much owing to the want of technical skill on the part of the director or workman in not grounding the work of a full enough colour, and also to the free use of white which is mixed with the turpentine to give body to the finishing tint. It is better to work up to the finished effect with a medium containing oil sufficient to give at least an egg-shell gloss, and then to take off what lustre there may be by a very thin wash of a sizing medium or spirits of wine with a small quantity of clear shellac in it.

A few colour laws which every colourist finds of value may now be briefly stated:—

1. Different tones of the same colour tell well beside each other, or in the same composition. Take, for example, all the tints on a piece of self-coloured velvet or silk. There are unending gradations of these. Much interesting work has been done on this idea on the lowest scale of colour, viz., that of greys. Mr. Waterhouse expresses his predilections for pearly greys and drabs and ivory, red or green, with very small points of delicate turquoise blue. Omitting the red or green meantime, his predilections for the pearly greys and drabs, and ivory, are well worthy of being kept constantly in mind, as these are in sympathy with the general greyness of our climate and surroundings, but it will strike all colourists that unless these tints are handled in a masterly way there is the danger of insipidity. Marvellous things, however, have been done in greys, as all students of the works of Velasquez know. The late John Philip, — known as Spanish Philip,—acquired much of his power in colour by the study of Velasquez, particularly in his handling of greys, and, one day, being impressed with a very powerful Spanish study he was at work upon, he showed me his palette and remarked that he never used a positive colour but got the force he desired by the use of greys. "Mind your greys" was a common remark to students, and many of his charming colour jottings of scraps of old grey walls bore witness to his appreciation of grey; but from greys working on the principle of tone upon tone of the same colour all through the different primaries, secondaries, and tertiaries, there is scope for all manner of delightful symphonies.

The law of complementary colour is all important. Its value is illustrated all over the face of nature. Let me as a simple illustration refer you to a piece of Queensland opal. Looking on the face of it, there are the soft greens, blues, and purples; but on looking through it towards the light you have the most perfect complementary tints to these colours in the soft golden reds, ambers, and yellows. A clever touch of a complementary tint gives clearness to the symphonies just referred to; and the complementaries can be applied from strength to strength until the most powerful effects are produced. But it is evident that the larger and simpler the masses of colour and their complementaries, so much greater will be the force. A Persian carpet may be full of the most beautiful contrasting combinations, but its general effect may be far from striking. Coloured hues on neutral grounds have a pure and telling effect, more so than tones of colour which are produced more or less by grey. As to the primary red, all good reds are based on yellow. Pompeian red is what is generally thought of when a strong, fine red is required; but it has seldom been seen in this country, it is not understood. Dr. Murray, keeper of the Greek and Roman Antiquities in the British Museum, has passed through a time of much affliction in his efforts to get it on some of the walls of the Museum. A day or two ago, I sat at lunch in a large room, the walls of which were painted with so-called Pompeian red, but what with



Cathedrals o

No. 5. WELLS.—



and Wales.

OLAND W. PAUL.

cold purply tinge, and the reflection a white ceiling and deep frieze, the faces of in the room had a cold, wintry look. A reful effort to catch the precise hue or tone of e Pompeian red from some of the best slabs the Naples Museum, impressed me with the ount of yellow there was in it. I was trying match it in water-colour, and found the arest approach to the red was got by a xture of Italian yellow, burnt sienna, crimson e, and vermilion. A very fine example of old velvet picked up in Florence will also prove at I am saying, for the surface is so worn t the fine yellow grounding is showing rough. Let me also draw your attention to a dress in Tintoretto's picture of St. George d the Dragon in the National Gallery, of ich a colour match is before you. The fine ality of this red arrests us. A powerful com-mentary green, however, gives it intensity, t an analysis of the colour gives a great ount of yellow.

As to yellow, its value has been referred to my paper, and so convinced am I of its efulness that I always would advise the pot mixing colours from, to have more or less of low in it. Owing to the luminous nature of low, as well as red, large surfaces require to very broken in the tint. The placing of a tching of Pompeian yellow and red, beside re primaries will be quite convincing. I ve heard a powerful colourist remark that od colour ever goes towards yellow, and the rst towards purple.

Blue is a difficult colour to handle. This st impress all who make a tour through the lian and other churches, especially as seen the stained glass. In broad treatments it n only be used in a most modified degree to pleasant, and it requires a strong infusion of rm colour. I remember an artist tinting a minous blue sky at Rome on white paper. began with a wash of delicate rose madder d afterwards tinted in blue. Of all nature's es among flowers the scyllas and forget-me-s may be selected as among the finest, and h reveal the presence of rose tints mingling h the blue. Every good colour composition uld have in some degree the three primaries. A patient study of M. Chevreuil's work on our will repay the student, and much that put forward by M. Chevreuil as to the influ-e of one colour upon another would be of eat value if carried in our minds.

Gilded treatments are always pleasant if htly introduced, but here again a great dification is necessary in large masses; and, tunately, there is much scope for obtaining e effects by lacquers and coloured glazes on luminous body of a gilded surface as a ge of lacquers now in constant use will w you.

think it may be taken as a rule that any ious colour effect cannot be directed from an ce table, because there are always conditions ich to a greater or less degree qualify the es or colour tints. We have to consider the d of light that falls into the room from a thern or southern sky, or perhaps a reflected ht from the street paving, or houses opposite, d also the amount of light. These considera-ns are felt to be of consequence when one es up the palette knife in the room. Then, here is a direct sky light falling into the m, the reflection from the floor, which may carpeted, counts for much as its influence is on the ceiling and parts of walls not reached direct light.

One word of great value in commencing to rk out a colour scheme is *assimilation*, and practical value can soon be tested by mixing ot of what might be termed the dominant key colour, and from that pot take more or colour for harmonising and contrasting ry tint employed. An extreme illustration assimilation of colour will occasionally be nd on the Academy walls in the portrait of dge or cardinal, say by Ouless or Pettie. If shut out with your hand the red dress, and k at the flesh colour, you will see what an ount of red has had to be added to the tural tint of the skin to enable it to hold its ht relation to the dress; and so more or less through.

n my attempts to match the finest points of our in the National Gallery, I was struck h the fewness of the colours I required. ese I used were a medium yellow (which pened to be Mander's yellow), middle rome, primrose chrome, burnt Sienna, ver-lion, scarlet lake, Prussian and Antwerp blue, nswick green, Vandyke, white and black.

At the last meeting of the Institute much that was instructive and suggestive was said regarding the employment of mosaics, fresco, and *tempera*, and the employment of these methods of decoration ought to be in every way encouraged. The increasingly-migratory habits of our population, and the shortness of leases, especially in London, are, however, great drawbacks as far as domestic work is concerned. The revival of these decorative mediums on old principles would impart a seriousness and worthiness to many associated methods. The most interesting and skilful treatments of these are clearly those which have caught most of the spirit of the architecture, and hold their place as accesories or crowning embellishments. When these enrichments are found developing themselves in the roundness of modelling and fulness of detail and colouring, as seen in pictorial art, then we conclude we are approaching a period of decline in decorative art. The vigour and simplicity of the mosaics in St. Mark's at Venice, or in the apse of San Clementi at Rome, are such as must hold their value through all time. The same may be said of some of the tapestries in the Vatican galleries, which, when seen alongside those designed by Raphael, are greatly superior because of their architectural feeling. Mention also should be made of Giotto's walls in the chapel at Padua. These paintings are very simple and elementary, and may be regarded as the beginning of the great Renaissance development of such work, but, although elementary, they express their object and make the small chapel a place of great interest.

The frescoes of some of the earlier masters following Giotto display marked capacity for catching up in their work the architectural feeling of their surroundings.

The influence of good men is most direct, and, without mentioning the names of the living, it is undeniable that such men as the late William Dyce and Alfred Stevens were full of the right spirit; and one can hardly speak of J. D. Sedding as being no more with us. I shall never think of him as dead; his lovable character and enthusiasm will speak with beneficent power while memory lasts to all who knew him, and it is to be hoped that soon the Institute will be in a position to arrange an exhibition of his work.

There is one talent which we all possess, and that is individuality; and as the colour field is so wide-reaching, there must be stretches in it in which we can all develop our own selves, rather than being the slaves of fashion or passing whims, and I am sure I cannot better close my paper than by again alluding to one remark of Professor Richmond, that what we want in this country is light; and to another, from the same source, that "the dignity of good work is the thing to keep before young men."

[Some notes of the discussion which followed will be found on another page.]

NOTES FROM AUSTRALIA.

A MOST important step has lately been taken by the junior members of the profession in Sydney in the formation of an Architectural Association on the lines of its wonderfully-successful London prototype. It has now been fairly launched, has already had its first general meeting, and already numbers no less than seventy-five members,—a result, considering the comparatively small community of which we form part, which is most gratifying. Hitherto there have been no facilities for professional intercourse between the younger members of the profession, but the new Association will supply this need. The rules have been drafted very much on the lines of those of the older society,—and, indeed, several members of the committee were members of the London Association. The President is Mr. S. Hurst-Seager, A.R.I.B.A., who for some time was connected with the office of Professor Roger Smith. The vice-presidents are Messrs. G. J. Oakeshott, A.R.I.B.A., and G. D. Payne, both Englishmen, and well known in London,—the former especially by his book on the "Details of the Italian Renaissance." The honorary secretary is Mr. F. W. Marks, A.R.I.B.A., also an Englishman. It will thus be seen that the Association commences its work under the best auspices, and there is little doubt but that it has a prosperous future before it. The hope of the profession in Australia is in its young men, and if they are influenced by the spirit which pervades the members of the new Association, the standard of professional and artistic attainment will be appreciably raised before many years pass by.

In the colonies of Australia the respective Governments carry out a far larger proportion of public works than in any of the other countries in the world peopled by an English-speaking race. As a natural result, these works being under the control of politicians, the exigencies of the moment, instead of the intrinsic merits of the works, are apt to exercise an undue influence when a selection of one or two out of many proposals has to be made. Branch lines of railway, which do not pay for the axle-grease bestowed on their wheels; harbours formed for the use of a few coasting vessels; and public buildings four times as large as the needs of a provincial town demand, are the frequent result of this system. In New South Wales the evil has become so patent that a Standing Committee of Public Works was appointed, consisting of members of both Houses, to whom the proposals are submitted for report, and they have done such good work that it is probable all the other colonies will follow suit. Indeed, Victoria has already instituted a Parliamentary Standing Committee on Railways. For some weeks past a subject of considerable interest to the architectural profession in Sydney has been before the Committee,—viz., the uncompleted structure of the Sydney Hospital in Macquarie-street. It was commenced many years since, and the walls carried up to the level of the first floor at an expenditure of about 60,000*l.*, when the funds ran out, and a new Government being in power inimical to the scheme, further progress was impossible. The present Government, being desirous to complete the building and redeem the city from a standing disgrace, the subject was referred to the Public Works Committee, and a mass of medical and architectural evidence obtained. The report of the Committee has not yet been published, but it is quite evident that the building will not be completed on its original lines, which would involve a total expenditure of 200,000*l.*

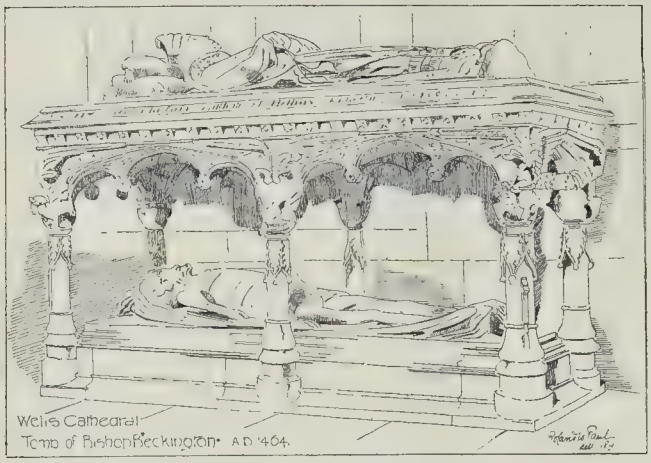
The site on which the Hospital stands on the edge of the Domain is the finest in Sydney, and the whole of this side of Macquarie-street will undoubtedly in the future be graced by public buildings of the highest class, such as the Law Courts, Parliament Houses, &c.

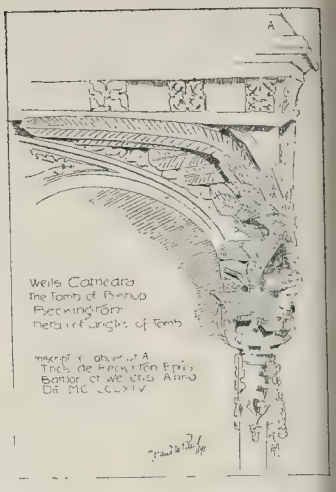
Mr. W. L. Vernon, the present Government architect, with wise prevision, recommended that Macquarie-street should be increased in width from 60 ft. to 100 ft.; but this would involve the setting back of the Hospital. Macquarie-street would then become the one fine street in Sydney, and so great an improvement would be cheaply purchased even at the sacrifice of the whole of the money spent on the building. It is to be hoped that Mr. Vernon's scheme will be carried out.

COMPETITIONS.

Baths, Bacup.—In reference to the statement under "Competitions" in our issue of April 18, to the effect that the estimates from Mr. Wilson (who stood first in the list of competitors) "being unsatisfactory, were rejected by the Committee," Mr. Wilson writes denying the correctness of this statement, and maintaining that it was owing to the death of the original intended donor of the funds, who had selected him as architect, that he was not employed. His letter goes into private matters which we do not feel at liberty to drag into print.

"AN OLD WRITER ON OLD TIMES."—We regret that a sentence was included in the article under this head last week which has given not unreasonable offence to one at least, and perhaps to more, of our Catholic readers, to the effect that the Catholic creed of the present day rases out the Second Commandment against graven images. The article was mainly composed of quotations from Fuller, with a few remarks interspersed; the quotation commas in the passage referred to were inadvertently put in the wrong place, and as the date, "1891," escaped notice in reading the manuscript, it was left as a quotation from Fuller, whose diatribes, at the distance of more than three centuries, can do no one any harm. The statement appears to be entirely incorrect; but whether true or not it would have been erased at once had we recognised that it was a remark of the author of the article, and not a quotation from the "old writer," as we never under any circumstances admit reflections on the religious faith of any community.





Illustrations.

WELLS CATHEDRAL.*

UNLIKE the cathedrals hitherto given in the present series, Wells shows no traces in its fabric of the Norman church. Although it is known that a building stood on the site in very early times, and that a church of some size was standing in Bishop Robert's time (1135-1165), the building now presents to the eye nothing that can be placed at an earlier date than the end of the twelfth century. To this period and the first portion at all events of the thirteenth century the portions shown black on the plan belong. This includes the whole of the naves, the central tower to the ridges of the roofs, the first three bays eastward of the tower, the transepts, and the west front and base of the two western towers. Various theories have been advanced from time to time as to the order in which these portions were built. The western front is of distinctly later type to the plainer work of the nave, and it is reasonable to suppose that during the long period which elapsed between the destruction of Bishop Robert's church and the completion of the Early English building by Reginald and Joceline, the works began at the east and advanced gradually westward. At this time the ritual choir would have extended a short distance west of the central tower, and an aisle or ambulatory stood at the east end. This aisle is easily traceable on reference to the plan. The peculiar feature of the Early English work at Wells is the use of the square abacus in the caps of the arcade. It has a very un-English appearance, and suggests Canterbury influence. Projecting south from the transept there would seem to have been a cloister, and nearly half-way down, on its eastern side, was a chapel known as the Lady Chapel "juxtra claustra."

In 1885 excavation revealed the plan of an octagonal building, the centre line of which coincided with an Early English doorway still *in situ*. This probably was the building referred to, and which was also used as a chapter-house (before the present one was built on the north side) and as a burial-place for some of the De Bitton or Button family. We shall have occasion to revert to this Lady Chapel again.

The next important addition was the magnificent chapter-house standing on a crypt or substructure. Strictly speaking, it is not a crypt, its level being only very slightly lower than that of the church itself. The entrance to it we give in the subjoined sketch. This portion is of distinctly earlier date than the chapter-room over it; and we have indicated it as "Transitional" on the plan. The unique staircase and the chapter-house itself are Decorated work of the time of Bishops Burnell (1274-1292) and Wm. de la Marchia (1294-1304).

Following this work came the elongation of the presbytery, making it of six bays instead of three, and the new Lady Chapel with the lesser transeptal chapels flanking its vestibule on either side. The general effect of this portion



of the building as an interior is probably not to be surpassed in England for grace and cleverness of design. The new Lady Chapel, like the old one, "juxtra claustra," was designed on an octagonal plan—in this case somewhat elongated in form—and even the little sacristy on the south side (now destroyed, but shown on the plan) was in itself a semi-octagon. During the Decorated period a portion of the central tower was raised, but like some other towers built in Mediæval times, its weight caused the earlier piers to give way, and additional strength was given to them by the insertion of inverted arches on the west, north, and south sides. The serious cracks are still visible in the tower, which was originally intended to be a lantern, but in Perpendicular times vaulted above the main arches. Additional strength was given by inserting flying buttresses in the walls which blocked the lower portion of some of the clear-story windows next the tower. This tower is a very graceful one, the delicate clusters of pinnacles at the angles which were built at a later date adding much to the effect, and contrasting with the somewhat unfinished appearance of the western towers. The cloister which had been protected on the south side by a wall in the fourteenth century, had its western alley completed by Beckington (1443-1466). Alteration had previously been made by Bubwith (1407-1424), who vaulted the east alley and built the present library over it. His arms with the four holly-leaves are in the stained glass in the windows. The north-west tower was also completed by Bubwith, the south-west one being due to Bishop John Harewell (1366-86).

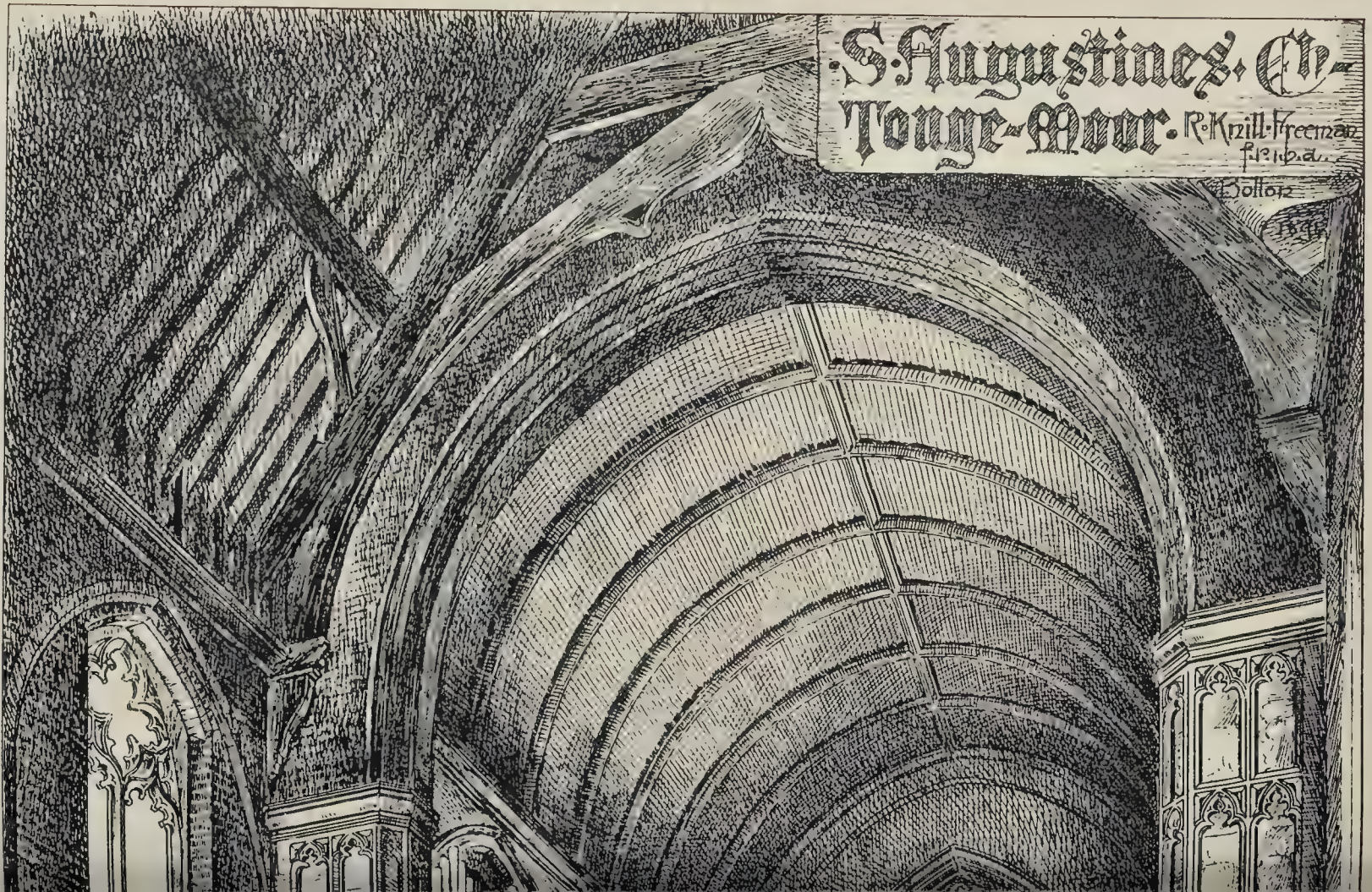
The last addition to the structure was the rebuilding of the Lady Chapel, "juxtra claustra," by Bishops Stillington and King. This was, however, destroyed by Sir John Gates in the reign of Edward VI., and only the fragments of the return walls exist against the cloister wall. It was, to judge by what is left, entirely panelled inside, and must have contained some rich detail. The foundations of this chapel have, however, been traced and are given on the plan.

Such is a rough outline of the gradual growth of the fabric. The general effect of the building and the additions at its eastern end are clearly shown on the plan, and in the view we give to-day taken from the south-east. The original Early English windows of the Presbytery have been blocked, and Decorated windows inserted to match the additional works eastward. The aisles have been likewise transformed, and in later times Perpendicular windows were inserted in all the Early English lancets westward of the crossing, except the great triplet of the west front. This has been also a good deal altered inside, so that there is not a complete window of the Early English period remaining.

Fine as the whole undoubtedly is as a group, with its unequalled surroundings, and cluster of Mediæval buildings, the wealth of decorative features and details throughout the building will repay the closest examination, and deserves more attention than it usually receives. The sculptured tiers of the west front with its wonderful series of statues claims general attention on account of its prominence, but in less conspicuous portions of the building are to be found a mass of work of all kinds and dates, which the ordinary observer would perhaps overlook.

The ground plan which by the kind permission of the Society of Antiquaries we are able to publish to-day, is valuable as showing the arrangement of the choir-stalls and presbytery before they were transformed by Salvin (1848-1854). It is much to be regretted that the alteration was ever made. The present effect of the stone stalls, set between the piers to give extra width, is cold in the extreme, and the scheme unfortunately included the removal of the beautiful canopy of the altar which Beckington erected during his lifetime near his tomb. It will be seen on referring to the plan what the arrangement was. The canopy, which is of stone elaborately coloured, and more like wood in the delicate treatment of its sculpture, was illustrated in our issue February 18, 1888. It is now

* We may mention here that the first of this series of illustrations of the Cathedrals of England and Wales, viz., Canterbury, appeared in the *Builder* for January 3; the second of the series, viz., Lichfield, in the number for February 7; the third of the series, viz., St. Albans (before the alterations of recent years), in the number for March 7; and the fourth of the series, viz., Peterborough, in the number for April 4. The sixth of the series, viz., Exeter, will appear in the *Builder* for June 6 next.


S. Augustines, Cl-
Tonge-Moor. R. Knill-Freeman
F.R.I.B.A.
Bolton
1891



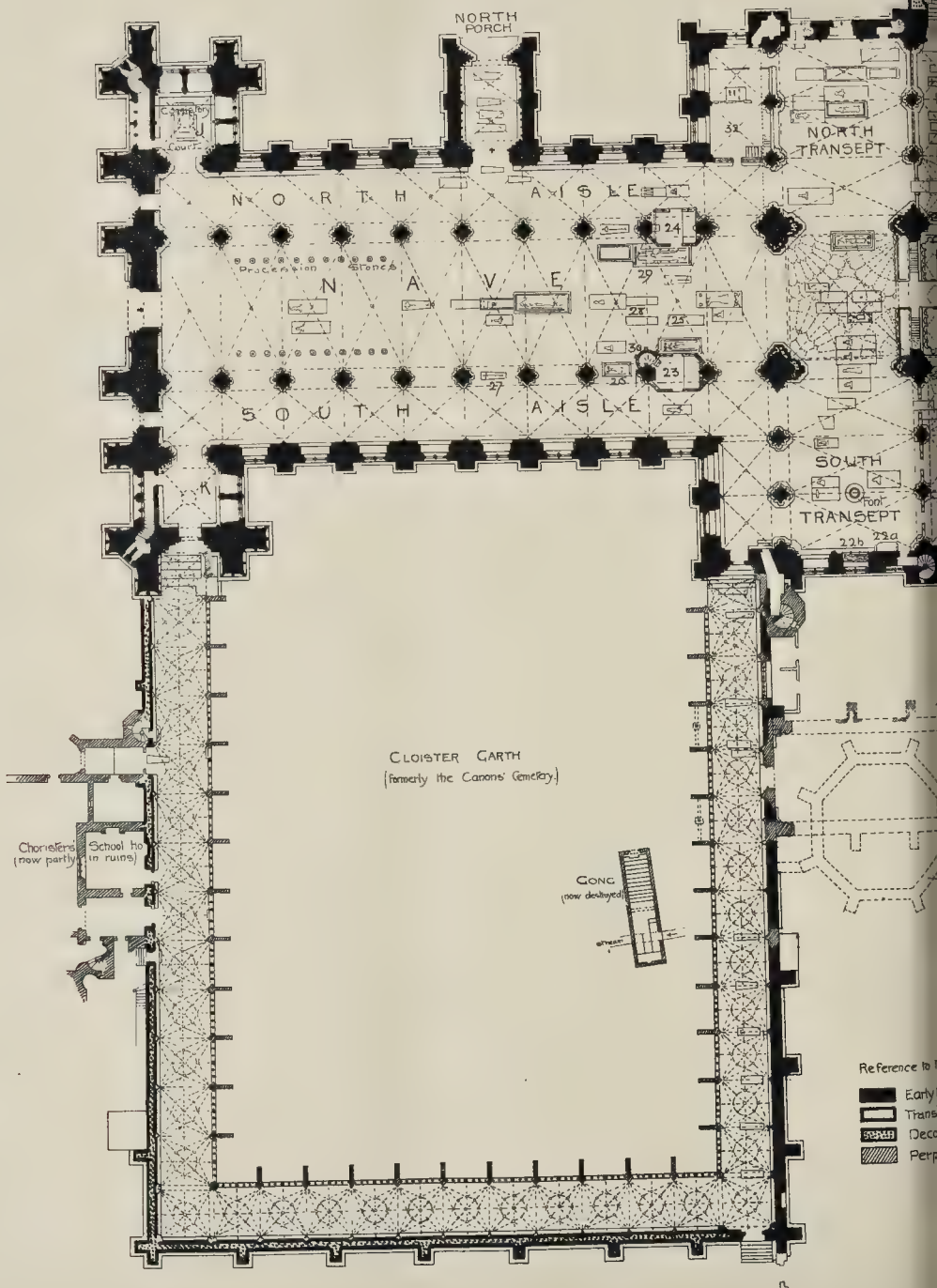


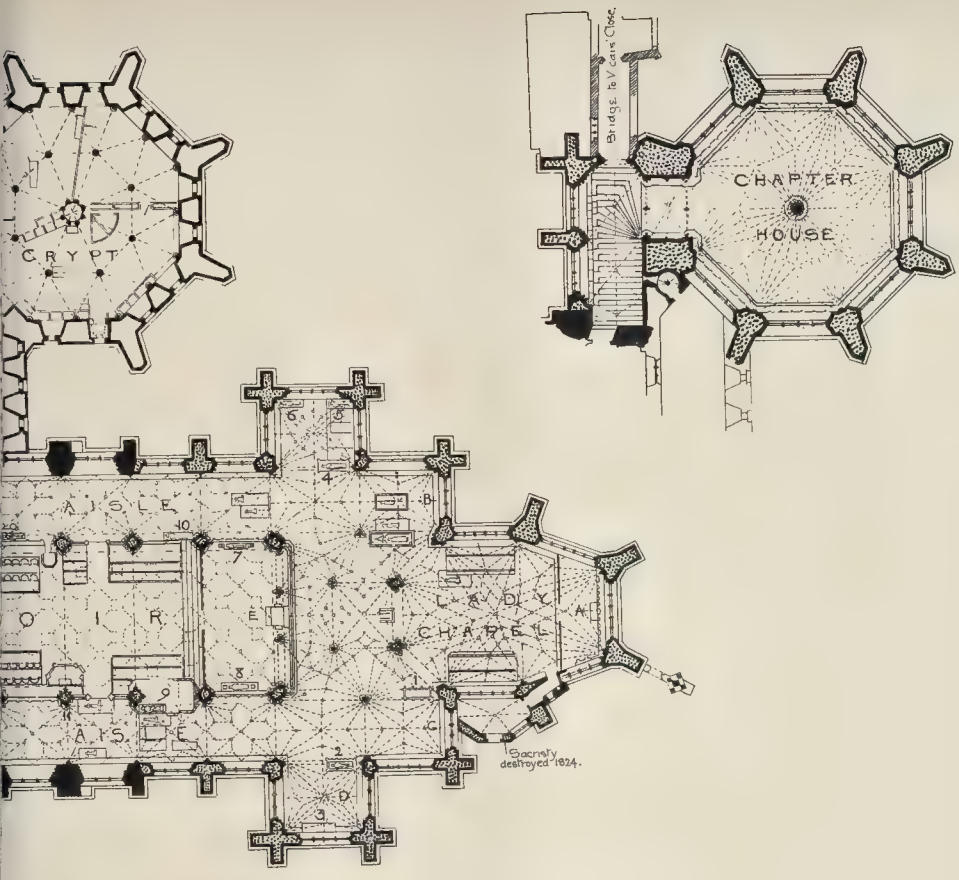

TOMB OF FELIPE I & JUANA
CAPILLA REAL ESPANALA
SKETCH OF ONE ANGLE

THE CATHEDRAL CHURCH OF SAINT ANDREW, WELLS

GROUND PLAN.







Cemetery

Chapels & Altars.

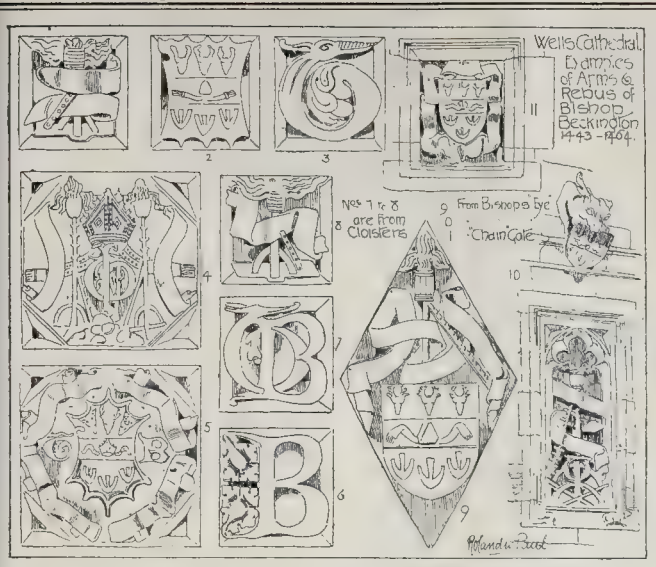
Lady Chapel altar
St. Stephen.
St. Catherine & all Virgins.
St. John Evangelist.
High Altar.
Holy Cross.
St. Calixtus
St. Martin.
Holy Cross.
St. Edmund.

Monuments

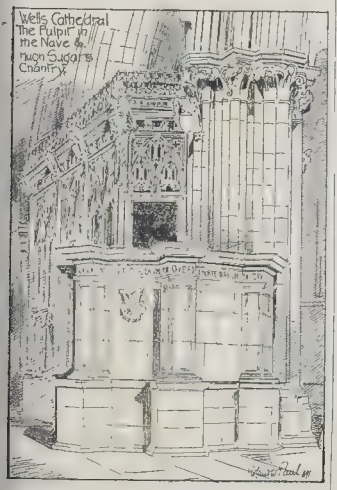
1 Bishop Bitton 1st
2 " Drokensford.
3 Dean Gunthorpe.
4 " Forrest.
5 Bishop Creighton.
6 " Berkeley
7 " Kidder
8 " Still
9 " Beckington.
10 " Ralph de Salopia.
11 " Lake.
12 " Bitton 2nd
13, 14, 15 Effigies of Early Bishops.
16 Site of Tomb of Jocelin de Wells.
17 Bishop Cornish
18, 19, & 20 Early Effigies.
21 Dean Husee.
22 Chancellor John Storthwaite.
22a Viscountess Lisle
22b Bishop Wm. de Marchia
23 Dr Hugh Sugars Chantry.
24 Bishop Bubwiths "
25 " Knight.
26 " Ergum
27 " Freas
28 " Beckingtons Executors
29 " Haselshawe.
30 The Nave Pulpit
31 Bishop Harewell
32 Clock room & Vestry.

Richard St. Paul del. 1891.
From Carter's plan now in the possession of the Society of Antiquaries; with additions from other sources.

PHOTO-LITHO SPRAGUE & Co 22 MARTINS ALL CANNON ST E.C.



placed against the east wall of the chapel of St. Calixtus. The tomb we illustrate to-day. Its detail, more particularly the treatment of the angels, is the same as on the canopy, and the whole retains considerable traces of colour. Surrounding it was a good wrought-iron railing, part of which still encloses the tomb, and part is used as a screen to the eastern chapels of the south transept. It is fervently to be hoped that at no distant date this beautiful work may be replaced, and thereby add to the beauty of the presbytery. It was a great piece of vandalism ever to have moved it, and the question of accommodation is so slightly affected that there is little excuse for its remaining in its present dismembered condition. We have not space to enter into the details of the various monuments. There is in this cathedral a very fine series of stone effigies from the early Bishops to those of the seventeenth century. Two chantry chapels similar in the arrangement of their altars (though with no altar tombs) to that of Beckington stand in the nave in the second bays of the nave arcade west of the crossing. That on the north is ascribed to Bubwith, and has his arms against the column at the west end. That on the south side is the chantry of Hugh Sugat, LL.D., one of Beckington's executors, with the



late nave pulpit attached to, and approached from, it, built as a memorial of Bishop Knight (d. 1537).

Of the other monuments the most interesting are those of Bishop Bitton 2nd (an incised slab in the south aisle of the choir), the effigies of Wm. de la Marchia (whose tomb we fully illustrated in the *Builder*, June 12, 1886), Ralph de Salopia, Bishop Harewell, and the later tombs of Bishop Creighton and Bishop Still.

A great number of the windows in the eastern arm of the church retain their fourteenth-century glass. The great east window of the presbytery is a "Jesse" in good preservation, and in the aisles and the Lady-chapel are numerous fragments of the same date. There is some good heraldic glass and an interesting series of figures of fifteenth-century date in the windows of the south nave aisle. Again, in the Chapter-house and its staircase there are still some valuable portions of the glazing remaining. There is not much ironwork left—the earliest example is the inner door of the crypt or undercroft of the Chapter-house, which is of fourteenth-century date.

The amount of decorative carving in various portions of the building is very large. Most of it occurs on the monuments, such as the panels on the tomb of Dean Husee in S. Calixtus' Chapel, the rebuses on the Gunthorpe and Cornish tombs, Hugh Sugat's Chantry, and in the cloisters. In the west walk of the cloister is a very interesting and valuable series of examples of the arms and rebus of Bishop Beckington, which we here illustrate.

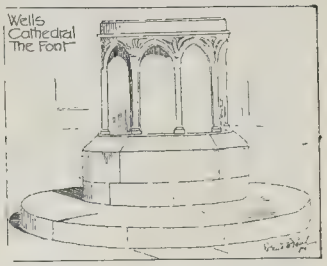
Others occur in various places, chiefly on the gateways to the Close, locally called "Eyes," which were erected during that Bishop's episcopacy.

In woodwork the Cathedral is not rich, but two or three misereres of excellent workmanship are to be seen in the library over the east cloister, and were illustrated in the *Builder*, August 3, 1889.

In the north transept is the celebrated clock, brought from Glastonbury Abbey at the Dissolution. Outside the north transept two armed figures strike the quarters on bells, while inside a seated figure does the same with his heels. At noon four knights revolve in opposite directions and tilt. It is said to date from the fourteenth century, and bears the maker's name and inscription, "Petrus Lightfoot monachus, fecit hoc opus."

The font, which stands in the south transept is apparently Norman reworked, and is the only remaining portion of the earlier church.

No description of Wells Cathedral would be complete without some notice of the buildings which surround it. On the south stands the Bishop's Palace, with its fine Decorated chapel and ruined banqueting-hall of Bishop Burnell's time, the whole building being surrounded by an embattled wall and a moat, which is crossed by a drawbridge at a point nearly opposite the centre of the south front of the cloister. North of the Cathedral are the Deanery, the Canons' houses, and the Vicar's College, with its own chapel and hall, and communicating with the cathedral by a passage crossing the Bath-road to the top of the Chapter House staircase, known as the "Chain Gate." It is a prominent feature in the views of the north side of the cathedral, and shows in a view published in our issue of February 18, 1888. There are several other detached houses, mostly of the fifteenth century, including the Precentor's house and the house of the Master of the



Fabric, both north-east of the cathedral. It must always be remembered that the foundation at Wells was for secular canons as distinct from the monastic rule, and therefore we find a totally different arrangement of buildings. The whole, with the grand pile of the cathedral in its centre, is, perhaps, the most perfect example we have remaining of a Mediæval city.

ST. AUGUSTINE'S, TONGE MOOR, BOLTON-LE-MOORS.

This church has recently been erected to supply the wants of a rapidly-increasing suburb of Bolton. It provides about 600 sittings, all of which are free. The site being lower than the adjacent roads, the basement under the nave has been arranged to provide a large parish-room for Sunday-school or other purposes. The vestries are placed under the chancel.

The plan consists of wide and lofty nave, with baptistery on the north side, and a gallery with arcade under, at the west end, for scholars. The chancel is large and well elevated. The aisles both to the nave and chancel are narrow, and used for passages only. The organ-loft is above the choir-stalls on the north side of chancel.

The building is of Yorkshire parpoints, with red Rainhill stone dressings, and the roofs are of green North country slates. The inside woodwork is of pitch-pine, with the exception of the screens, &c., which are painted and decorated.

The works have been carried out by Messrs. Geo. Woods & Son, of Bootle, Liverpool, from the designs and under the superintendence of Mr. R. Knill Freeman, F.R.I.B.A.

*** We may add that this drawing was sent for the Royal Academy Exhibition (where we may presume it would probably have been accepted), and was prevented from being delivered on the appointed day through the negligence of a railway parcel department in not delivering the frame in London until too late.

DETAILS FROM TOMBS AT GRANADA.

The two illustrations given, of details from the tomb of Ferdinand and Isabella and from that of Felipe I. and Juana, both at Granada, are from the collection of sketches made by Mr. H. V. Lanchester during his travel as Owen Jones Student, to which reference has before been made. They are exceedingly Italian in effect and feeling, and show how strong was the hold at first exercised on Spain by Italian Renaissance Art.

The Guild and School of Handicraft.—The fourth annual spring series of the practical lectures of the Guild and School of Handicraft will take place in the new workshops of the Guild and School at Essex House, Mile-end-road, E., on Wednesday, May 6, when Professor Herkomer, R.A., will open the course with "A Technical Talk."

Sheffield Society of Architects and Surveyors.—Mr. R. T. Blomfield writes to say that the condensed report of his paper on drawing read before this Society, and published by us (page 335, *ante*) is incorrect, and represents him as saying things which he did not say and would not have said. The report was furnished to us officially by the Hon. Secretary of the Society; we are not responsible for its accuracy.

THE ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association, held on Friday, the 24th ult., Mr. Leonard Stokes, President, occupied the chair.

Mr. E. S. Gale (Hon. Secretary) moved a vote of thanks to Mr. James Brooks for his kindness in permitting the members to visit his new church at Kensington, and for the trouble he took to arrange that they should have the opportunity of studying the construction of the vaulting *in situ*.

The Chairman then read the list of gentlemen nominated by the Committee to serve as Officers and Committee of the Association next session. In this list Mr. F. T. Baggallay was nominated President.

Mr. W. J. H. Leverton said that on behalf of Mr. Douglass Mathews and Mr. Phené Spiers, who were unable to be present, he nominated Mr. Hugh Stannus as President for next session. He also wished to nominate Mr. Edmund Woodthorpe as a member of the Committee.

Mr. Stannus said he wished to nominate Mr. F. T. Baggallay as a member of the Committee, for he felt that in the event of that gentleman not being elected President, he ought to be on the Committee.

Mr. Leverton seconded the nomination.

The Chairman asked whether Mr. Stannus or Mr. Leverton were prepared to say that Mr. Baggallay would serve on the Committee if elected? The rule stated that any one nominated must be willing to serve.

Neither Mr. Stannus nor Mr. Leverton being in a position to speak positively on this matter,

The Chairman ruled that he could not accept the nomination.

Messrs. Webb, R. G. Booth, Gamble, and Parkes were elected scrutineers to count the voting papers prior to the last meeting of the session, when the results of the election will be announced.

Mr. W. Scott Morton then read a paper on "Method in Colouring," the greater portion of which we print on another page.

In the discussion which followed,

Mr. M. Garbutt said he had much pleasure in proposing a vote of thanks to Mr. Scott Morton for his interesting paper. He regretted that there was such a very small attendance to hear it. The Colour Classes of the Association were not half so successful as they ought to be. Apart from the teaching in Mr. Morton's paper, the drawings and specimens on the walls afforded a practical lesson in themselves. The members would do well to bear in mind what had been said by Mr. Morton as to simplicity in colour decoration. He had shown that the highest effects could be obtained with a comparatively limited palette. They might also learn a lesson from the Japanese, whose reticence,—the power of only just putting in as much work as was necessary, and no more,—was well exemplified in the specimens shown by Mr. Morton.

Mr. H. W. Pratt, in seconding the motion, said they were all very much indebted to Mr. Scott Morton, not only for his paper, but for the collection of specimens which he had taken the trouble to bring together in illustration of it. The small attendance was to be regretted, but he hoped that Mr. Morton would not infer from it that architects did not care about colour. It was, he regretted to say, only too true that the Association's Colour Classes had struggled on for many years, and only just managed to keep alive. That was a very curious fact, seeing that colour was such an interesting subject, and one which should certainly be studied, to some extent, by every architect. The architect who had designed a building ought certainly to have a guiding hand in its decoration. He was not quite sure, however, whether they ought to follow Mr. Morton's advice as to decorating the apartments of their clients' houses in a high scale of colour. It was no doubt perfectly true that the somewhat glaring effect of such a scheme of colour would tone down with the progress of time to its proper key; but while that process of toning down,—which would occupy years,—was going on, their clients and their clients' friends would be displeased with it, and by the time that it had toned down to a more agreeable key, the architect's reputation would be gone. The work of one of our leading church decorators, Mr. Butterfield, had been very much condemned on account of its crudeness, or its high tone, or crispness, however it might be described, and there was no doubt whatever that Mr. Butterfield had always adopted a very bright system of colouring in his church architecture; he had gone on the ground that Mr. Scott Morton had mentioned, and provided for its toning down; but he (the speaker) was bound to say that the decorative work of Mr. Butterfield's which he had seen had not toned down, after the lapse of many years, to an extent that made it agreeable to him. One of the difficulties experienced by the decorator in the decoration of rooms was very often the absence of all knowledge as to the way in which the rooms were going to be furnished, and the kind of furniture that was going to be brought into them. The colour of the furniture, and of the carpet and hangings, would often mar the most carefully thought-out scheme of decoration. He agreed with Mr. Morton as to the value of texture in decoration. There seemed to be a development in the present day of raised surfaces for decoration, and such raised surfaces were of great value, inasmuch as they afforded play of light and shade which was of great help to the colouring, and led to the production of exceedingly rich effects. With regard to church decoration, he was glad Mr. Scott Morton had called attention to the subject of stained glass. In his (the speaker's) opinion, it was a mistake to put too much decoration on the walls where there were stained-glass windows; it would be far better, he thought, to spend the greater part of the money used for wall decoration in obtaining better glass than was usually provided. The whole subject of colour was one which was deserving of more attention at the hands of young architects, and he trusted that Mr. Morton's paper would have the effect of arousing more interest in it on the part of the members of the Association.

Mr. E. R. Barrow said with regard to the point raised by Mr. Pratt as to the interference of furniture with the decorations, it seemed to him that the architect should, if possible, have a hand in advising his client as to what furniture he should have, if he did not actually design it. It appeared to him that people had different notions about colour, and that after all it was purely a matter of taste. A client would sometimes insist upon designs and colours which to many other people would be simply hideous. It seemed to him that a proper taste for colour was largely a matter of education. If one went into the houses of the poor and uneducated, one would usually find that very vivid colours were admired. On the contrary, in the homes of better-educated people, low-toned colours were used.

Mr. Paul Waterhouse said he had much pleasure in supporting the vote of thanks to Mr. Morton. The subject was one of great interest, although, as it appeared to him, one of some difficulty; for the more one read and heard of different theories of colour, the more one was puzzled to reconcile the differences between them. The late lamented æsthetic movement left one legacy behind it, and that was, that you might put almost any tertiary colour with any other tertiary colour, without their disagreeing. On the other hand, he believed that Owen Jones said that all true combinations of colour should have in them the three primaries. Surely the truth was that the circumstances under which colour was used in any particular case so entirely altered the treatment that was necessary, that a set of laws that might be applicable in one case would not be applicable in another. He thought that was a point which was particularly exemplified in the difference between the decorative conditions of the interiors and exteriors of buildings. The same rules which applied to the interior would not, he thought, apply to the external decorations. With regard to the danger of the use of blue in decorative work, he referred to a window in St. George's Church, Hanover-square. That window was, on the whole, exceedingly harmonious; but, in his opinion, it was spoilt by the nimbus of blue around the head of the central figure. He was not quite sure whether the lecturer was not a little too hard on the use of white for the interior decoration of houses; perhaps he only meant to condemn the modern craze for white, and nothing but white, or, perhaps, white in two tints. There was in his (the speaker's) opinion great value in the sparing use of white, especially when it was used to connect different colours.

Mr. F. R. Farrow said he had much pleasure in supporting the vote of thanks to Mr. Morton—not that he felt he could say much on the subject of colour, which had always struck him as being a most difficult subject to talk about. He thought they ought to take the advice which Mr. Morton had given them, and not to endeavour to follow fashion in colour, but to use colour in a manner which would be pleasing to themselves. One could not treat colour in accordance with an elaborate set of scientific rules. It was all very well for scientists to talk of the laws of colour, but directly one began to work with pigments, it was found impossible to adhere to a set of scientific rules. As a matter of fact, they had to work by instinct rather than by rule.

After a few remarks from a member, whose name did not transpire, on the observed effects of different colours on mad people,

The Chairman, in putting the vote of thanks to the meeting, said he agreed with what had been said as to the difficulty of talking about colour. That difficulty, he thought, was due to the fact that our language was not capable of describing one's feelings about colour at all adequately. He agreed entirely with what Mr. Waterhouse had said as to the impossibility of applying general rules to colour decoration. He did not think they could lay down hard and fast rules for colouring, although they might accept broad principles capable of variation. As to the effects of different colours on human beings, he had been much interested in what had been said on the subject, especially as he was acquainted with a school inspector who stated it to be his deliberate conviction, as the result of observation and experience, that school-rooms coloured yellow always produced dull scholars.

The vote of thanks having been put to the meeting and carried,

Mr. Morton briefly replied, and the meeting terminated.

ARCHITECTURAL SOCIETIES.

Birmingham Architectural Association.—At a meeting of this Association, held on Tuesday last, the President, Mr. T. Naden, being in the chair, a paper was read on "Bes-bury Church," by Mr. A. Harrison, who gave a careful account of this little Herefordshire church, and of the old-fashioned village in which it stands. Among the many points described in detail, those having reference to the chantry chapel and the detached tower were of special interest. The chapel is of Late work, with an elaborate and beautiful fan tracery vault, and with elegant traceried windows; and the detached tower, which is one of seven in the immediate neighbourhood, is of massive construction and early date, placed at some distance from the church, and it appears to have been used as a stronghold for the villagers on the occasion of incursions being made by the neighbouring Welshmen. Mr. Harrison also gave many interesting details of the Bishop's Palace and the Preceptory of the Knight Templars, of which few remains now exist, and of other old buildings in the village. The paper was illustrated by a large number of drawings, prepared by Mr. Harrison, and at its close a hearty vote of thanks was, on the motion of the President, supported by Mr. C. E. Bateman, Mr. H. R. Lloyd, and several others, unanimously accorded to Mr. Harrison.

Glasgow Architectural Association.—On the 25th ult. a party of members of this Association visited the new offices of the Fairfield Shipbuilding and Engineering Company, Limited, at Govan, by permission of the architects, Messrs. John Honeyman & Keppie. The buildings are of red sandstone, enriched with sculpture. The party was conducted by Mr. Howieson, clerk of works.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday afternoon at Spring-gardens, the Chairman, Sir John Lubbock, presiding.

The Main Drainage.—The adjourned report of the Main Drainage Committee contained the following paragraph as to the Hackney Wick, Poplar, and Isle of Dogs drainage:—

"The Engineer has reported that in view of the proposed severance of the Hackney-wick, Poplar, and Isle of Dogs drainage from the Northern Low Level sewer, it will be unnecessary to add further pumping power to that existing in the engine and boiler house at Abbey-mills. He considers, however, that the Worthington engine and pump, ordered from Messrs. Simpson, and now approaching completion, could with advantage be utilised, together with another of the same design, as the pumping power on the proposed new Hackney and

'ale of Dogs sewer. The Council has recently accepted a tender from Messrs. Munday & Son for structural alterations to the boiler-house at Abbey-mills, but on being communicated with by the Engineer, under our instructions, they have agreed to suspend for the present all work in connexion with the seating of the new engine, and have expressed their willingness to forego so much of their contract as relates to the fixing of the new engines in the old boiler-house. They will also undertake the necessary work in the new engine-house on the same schedule of rates as that attached to their present contract.

The Engineer has also, under our authority, placed himself in communication with Messrs. Simpson & Co., and has presented a letter from them offering to make and erect a new Worthington engine and pump of a similar pattern and design, and on the same conditions as relate to the one now in hand, for the sum of 6,480*l.*, being 500*l.* less than their current contract. Having carefully considered this matter, we recommend—

'That the arrangements above stated be approved, and that, subject to an estimate to be submitted to the Council by the Finance Committee as required by the statute, a new Worthington engine and pump be made and erected by Messrs. Simpson & Co., at a cost of 5,980*l.*'

We have further to recommend in connexion with this proposed relief sewer, in order to obtain more complete information as to the nature of the soil through which it will have to be constructed,—

'That, subject to an estimate to be submitted to the Council by the Finance Committee as required by the statute, three borings be made at a cost of 197*l.* by Messrs. S. F. Baker & Son.'"

These recommendations were agreed to, after a short discussion.

Hoarding and Shoring Contract.—The Improvements Committee reported as follows on this subject:—

"The contract for hoarding and shoring in connexion with street improvements and dangerous and neglected structures, at present held by Messrs. W. Brass & Son, will expire on May 31, 1891, and we have, in conjunction with the other Committees concerned—the Building Act and the Corporate Property—had under consideration the question of inviting tenders for the new contract. We are of opinion that it would be very desirable for this contract to be amalgamated with those for 'General Works and Repairs,' which will expire on November 30, 1892, and we have therefore arranged that the new contract for hoardings, &c., shall expire at that date. We have carefully revised the forms of tender, contract and specification, and as time pressed, it being necessary that a tender should be accepted by the Council before the Whitsun recess, we have caused an advertisement to be issued inviting tenders for the works. We recommend—

'That the course adopted be approved.'"

The recommendation was agreed to.

Additional Office Accommodation.—On the recommendation of the Offices Committee, it was resolved to take on a lease of seven years from Lady Day last, at a rent of 325*l.* per annum, the house (well-known to architects) No. 31, Spring-gardens. This will make the fifth or sixth house acquired by the Council for office accommodation over and above that afforded at head-quarters, so that, as was incidentally remarked, the Council will sooner or later have to face the problem of providing adequate office accommodation for themselves under one roof.

Waterlow Park.—With regard to this park, the gift of Sir Sydney Waterlow, the Parks Committee reported as follows:—

"The Council on February 10 last sanctioned an expenditure of 4,900*l.* for the purpose of alterations at this park to suit it for the public use. The work is mainly being carried out by a special staff employed by the Council, but there are certain works which necessitate the employment of a builder, viz., the repair of the Superintendent's lodge; the alteration and repair of the conveniences at the rear of Lauderdale House; the repair of the north-western boundary wall, and erecting unclimbable iron fencing thereon; the restoring of the old terrace and steps at Lauderdale House, and constructing new steps into the grounds; the enlarging of existing entrances, and the formation of a new main entrance, including the supply of wrought-iron gates. We have now to recommend,—

'That the offer of Mr. A. Wallis to execute the above-mentioned works for the sum of 1,090*l.* be accepted, and that the Solicitor do prepare any necessary agreement, the payment to be part of the 4,900*l.* already sanctioned by the Council.'"

This was agreed to.

Statuary in the Victoria Embankment Gardens.—The Parks Committee also reported that

"It is necessary that the statuary in the Victoria Embankment Gardens should be cleaned, and, as it is a work requiring considerable skill and care, the estimated cost amounts to 172*l.* 15*s.* We recommend—

'That the work be entrusted to Messrs. Farmer & Brindley for this amount.'"

This was agreed to.

Coldbath Fields Prison Site.—The same Committee's report contained the following paragraph:—

"The Council will remember than on February 4 last we reported that by the Post-Office Sites Act, 1889, section 5, it was enacted that the Council might, within six months of the passing of the Act, give notice in writing to the Postmaster-General that it desired to purchase, as an open space, a portion of the site of Coldbath-fields Prison which was coloured green on a plan referred to in the Act, and that the sum required for the purchase was estimated at 8,443*l.*; but unless the desire to purchase was communicated to the Postmaster-General, he was not compelled to pay to the Council the 10,000*l.* which the Act provided he should pay if he desired to retain the whole of the site for Post-Office purposes. On this report the Council decided to make the offer of 8,443*l.*, which was consequently done. We have now to report, for the information of the Council, that a letter has been received from the Post-Office, stating that the Postmaster-General has decided to pay the 10,000*l.* rather than sell any portion of the prison site. We are, therefore, about to consider where a suitable equivalent open space in the district can be secured and laid out for that amount. This will be the subject of a future report to the Council before any definite step is taken."

Proposed New Cemetery at Tooting.—The Sanitary and Special Purposes Committee reported:—

"We have had under consideration letters from the Vestry of Wandsworth, from the Wandsworth and Clapham Union, and from inhabitants of Tooting, protesting against the establishment, by the Streatham Burial Board, of a new cemetery at Garratt-lane, Tooting. We do not consider that the Council should offer any opinion on the question of the suitability of the site, but we consider that in all new cemeteries established in the county a space of at least 40 ft. from the boundary walls should be preserved free from interments, and this view we have submitted to the Secretary of State, whose confirmation is necessary before a new cemetery can be brought into use. We recommend:—

'That the course taken be confirmed.'"

This was agreed to.

The Blackwall Tunnel.—The Bridges Committee reported as follows:—

"In order to afford additional information to the firms who will tender for the works in connexion with the construction of Blackwall tunnel, your Committee are advised by the Engineer that three further borings are desirable, viz., one in Preston's-road, Blackwall, another between High-street and Bedford-street, Poplar, and the third at the junction of Blackwall-lane and Ordnance-road, Greenwich. Tenders for the works have been submitted to your Committee, and the one most advantageous to the Council is that of Messrs. S. F. Baker & Son. Your Committee recommend:—

'That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the tender of Messrs. S. F. Baker & Son, amounting to 240*l.*, for the three trial shafts, be accepted.'"

The recommendation was agreed to.

The Metropolis Management and Metropolitan Building Acts.—The Parliamentary Committee reported:—

"We have had before us a letter from Mr. Albert Gray, on behalf of the Statute Law Committee, inquiring whether the Council entertains any objections to the repeal of sections 145 to 148 of the Metropolis Management Act, 1855, and whether section 243 is still operative; and also whether the dispute referred to in section 246 as between the hamlet of Penge and the parish of Battersea has since been determined, so as to justify the repeal of the section; and further, whether any objection exists to the repeal of sections 113 and 114 of the Metropolitan Building Act, 1855. Clauses 145 to 148 refer to the determination of the powers of the Metropolitan Commissioners of Sewers, the body which preceded the Metropolitan Board of Works, and we are advised by the Main Drainage Committee that sections 145, 146, and 147 do not now appear to have any operation, but that as section 148, amongst other things, vested the property of the Commissioners in the late Board, it should not be repealed. The Building Act Committee inform us that no objection can be made to the repeal of sections 113 and 114 of the Metropolitan Building Act; and the Local Government Committee, who have communicated with the Vestries of Penge and Battersea, state that those bodies see no objection to the repeal of section 246 of the Act of 1855. Section 243 only saves the rights of the Metropolitan Sewage and Manure Company, and is now inoperative. We recommend—

'That Mr. Gray be informed that the Council sees no objection to the repeal of the sections referred to in his letter, with the exception of section 148 of the Metropolis Management Act, 1855.'"

The recommendation was agreed to, and the other reports of committees having been disposed of, the Council proceeded to consider some of the notices of motion which were on the *agenda*.

Land for Artisans' Dwellings.—Mr. Beachcroft moved

"That it is highly desirable that the provisions of Part III. of the Housing Act, 1890, under which the Council is empowered to acquire land for the purpose of erecting houses or cottages for the working classes, should be extended so as to allow of land when so acquired being leased to companies or persons willing to erect dwellings under and subject to conditions imposed by the Council; that a petition be presented to Parliament accordingly, with a view to such alteration of the law as is required, and that it be referred to the Parliamentary Committee to carry out this resolution."

This was, after some discussion on an amendment moved by Mr. Bassett Hopkins, referred to the Housing of the Working Classes Committee.

Contracts at Low Prices.—On the motion of Mr. E. Jones, it was resolved:—

"That it be referred to the General Purposes Committee to consider and report on the policy of accepting tenders when it is apparent that the contractor can only carry out the work in an honest and substantial manner at a great loss; whether such a policy is contrary to fair and honest trading, and whether it tends to promote sweating, scamping, and the use of inferior materials."

The Council then adjourned.

Correspondence.

To the Editor of THE BUILDER.

MEGALOPOLIS.

SIR,—The sketch of the section of the steps of the supposed elevated scene at the theatre of Megalopolis given in p. 305 of your edition of April 18, which seems to be intended to illustrate Dr. Dörpfeld's criticisms of the "provisional restoration" proposed in the *Journal of Hellenic Studies*, does not correctly represent the facts of the case, but as the excavations are still proceeding, and several points of much interest connected with the question appear to have been brought to light subsequent to my visit to Megalopolis, of which I have as yet received only very imperfect information, I think it will be best to let the discussion rest for a short time. I shall have much pleasure in returning to it when the evidence is more complete.

April 28, 1891. F. C. PENROSE.

LEES OR LEGHS PRIORY GATEWAY AND ITS RUINOUS CONDITION.

SIR,—In your interesting "Note" in the *Builder* for April 11, p. 287, on the Gateway of Esher Palace, you state that it may be compared with the gateways of Layer Marney, Essex, *circa* 1506, and Lees or Leghs, near Felstead, Essex, founded *circa* 1229. Being familiar with Leghs, I would like to draw attention to what, at first sight, might appear an error, and that is the date of the Gateway. It is true, as stated, that Leghs was founded about 1229, but that is the Monastery, not the Gateway; the Gateway itself is of the Perpendicular period, and was probably built between 1458 and 1485.

I am particularly glad of the opportunity of drawing the attention of your readers to this charming piece of Mediæval architecture, which is so little known outside the county. The appearance of the Gateway is bold, warm, and pleasing in the extreme, being built with red bricks, and having stone mouldings and tracery. The Gateway is rectangular in plan, with octagonal towers at each corner having embattled turrets.

The chimneys are of exquisite ornamental moulded brickwork, and characteristic of Essex alone. In the upper part of the gateway were rooms, which were oak wainscoted, but this, alas, has been destroyed and burnt for firewood during the last forty years. The magnitude of the Gateway is considerable, the height of the turrets from the ground-line being 80 ft. The condition of this noble pile as a whole is ruinous in the extreme, especially the beautiful chimneys, which will, I fear, soon become a total ruin, if some helping hands do not shortly come to the rescue. It is a building well worthy of preservation, and ought, and would be in some countries, looked upon as a national monument, rather than as a shell or shelter for cattle, which I am sorry to say is the function it usually performs. JOHN M. WOOD.

REMARKABLE DISCOVERY IN THE ISLE OF WIGHT.

SIR,—There have just been discovered on the heights of Freshwater, in the Isle of Wight, some curious terra-cotta slabs and broken pottery, which some persons in the locality believe to be the work of the Phœnicians. Whatever may be the result of the critical examination, it is more probable, as Portsmouth was once a Roman naval station, and a splendid Roman residence has been dug out at Brading, that the remains are Roman. In taking some extracts in the British Museum library, however, a short time since, I was surprised to find running through the works of several historians, indications of a tradition to the effect that the Phœnicians, who came to Cornwall for tin, used, for some unexplained reason, to travel along the South Coast as far as Hampshire, where they crossed by a strip of land to the shore of the Isle of Wight, near the Needles. At a spot close by it would seem they must have embarked, and that spot would have been Freshwater. The famous navigators of the ancient world would, however, hardly have come all this way out of their course unless for the purpose of making a short cut to Gaul, where they also had commercial relations. The tradition probably owes its foundation to the strange mistake of some ancient writers in confounding the Scilly Isles and St. Michael's Mount with the Portsea and Hayling Islands and the Isle of Wight. The slabs can scarcely be of a Phœnician funereal character, inasmuch as that highly-civilised people usually buried their dead in sarcophagi in underground catacombs. It is possible that we may hear of something which may clear up the question of those ancient mounds on the lofty slopes of Freshwater, which up to the present have been taken for British.

CLAUD MONTAGU.

ACCOMMODATION FOR WORKMEN.

SIR,—May I as one who is entitled to an opinion from over a quarter of a century's experience,—from boy to foreman, thence to clerk of works (in several parts of England, and in Government service in the colonies and at home)—call the attention of your readers to the lack of accommodation for meals given to the building operative, specially in country places, where he has to walk to and from his work, and is often without a shelter when he reaches it. I would suggest the provision of a fairly wind and water-tight mess-room, and giving a pint of boiling water to each man when he stops at each meal, and on leaving for the day. He can then mix for himself some tea, cocoa, or coffee, and have a wash before meals and before walking home. He has no excuse for entering the roadside inn, and should get more rest during his meal-time. The expense is not great, frequently only putting a kettle on a fire already alight; but the men cannot get hot water without wasting much of the meal-time in fire lighting, often endangering the building. I can speak from the experience of several places, as well as several buildings, that a place to sit in and the water ready is appreciated by men, and I have cause to know it is a practical help to "temperance." To ensure this not being read as a teetotaler's fad I subscribe myself,

NOT A TEETOTALER.

ARCHITECTURAL EDUCATION.

SIR,—On receiving the Royal Institute of British Architects' Journal for March 5, I was surprised to see the memorial to the Council signed by many well-known architects, objecting apparently to the Institute examinations.

In the colonies, where one has to deal with builders of no established reputation, and where labour and materials have to be used with the strictest economy, a systematic training giving a precise knowledge, such as engineers have, would be invaluable; and there is no doubt that the Institute is doing an immense service to the profession by insisting on such a training, superseding the system at present too much in vogue of paying high premiums for the mere acquisition of draughtmanship and office routine, while the essential scientific knowledge has to be picked up at night-schools, and by private and undirected study. The result of the Institute's course of action is a greatly improved position of members of the Institute in the colonies.

Apart from this, without a precise knowledge of construction and good detail, no man can carry out to the best advantage an artistic conception; and no man's artistic qualities are interfered with by a knowledge either, say, of the constituents of cement and the necessary mathematical knowledge of working out strains, or by knowing something definite about the history of architecture. The tendency of the examinations will be not to keep artistic men out of the profession, but to make them capable of utilising their artistic powers to the credit of the Institute, by making them apply themselves to the distasteful details of their profession.

GEO. A. HAMILTON DICKSON, A.R.I.B.A.

Pretoria, April 3.

ARCHITECTURAL ASSOCIATION VISIT.—We are obliged to defer our report of this till next week.

The Student's Column.

VENTILATION AND WARMING.—XVII.

FANS (*continued*).

AXIAL or helical fans, as the names given to them imply, induce an air-current in the direction of or parallel to their axes, and this by the rotation of a screw-like form.

The earliest forms of axial fans were constructed on what is popularly known as the Archimedean screw principle,—that is, a continuous helix. This form, however, produces two currents of inverse and opposing direction: one towards the circumference, which is useful, the other returning towards the axis, which is not only useless, but decreases the efficiency of the fan.

Fans with a continuous helix may therefore be regarded as wrong in principle, and bladed fans alone should be employed for axial as well as centrifugal fans.

With axial fans the experience of the most successful examples appears to show that the best form of the blades is a flat blade inclined to the axis, rather than a curved blade. The curved blades with axial fans seem to intensify the returning or central current and to produce eddies in the air stream which lessen the efficiency of the fan.

To obviate, and, as far as possible, avoid these unfavourable return currents, in some of the largest modern fans a coned centre is adopted as shown in the diagrams of the fans in use at the new Rath-haus, Vienna, figs. 26, 27, and 28, which give the main lines of the elevation, section, and plan, indicating the cone C, and the twelve blades B.

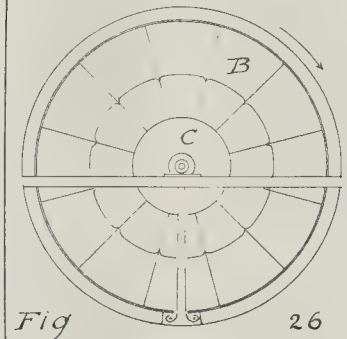


Fig 26

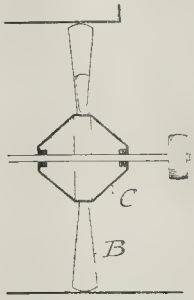


Fig 27

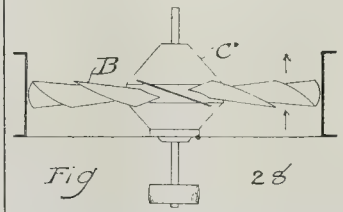


Fig 28

The Blackman Air Propeller, which is well known in this country, is a good example of a well-designed axial fan, and will be found efficient under the circumstances for which it is best adapted, but rapidly loses its value in confined situations, or if required to force air through ducts offering considerable resistance.

As we have already premised, axial fans are best suited for the propulsion (or suction) of large volumes of air at low velocity and low pressure. If we attempt to drive the air at a greater velocity than about 12 ft. per second, or at a higher pressure than one inch of water, we diminish the efficiency of axial fans very materially, while ordinarily a pressure of half an inch of water will give far better results.

The rapidity of revolution of the fan will vary with its size, small fans being with advantage driven at a higher rate than large. In using fans it should, however, always be remembered that increasing the rapidity of revolution always means a large increase of energy expended incommensurate with the increase of volume obtained. To endeavour, therefore, to gain increase of volume by greater rapidity of revolution of a small fan instead of using a larger fan at less speed is an extravagant expenditure of energy, and necessitates the use of motors of much higher horse-power. It may be asked what becomes of the energy thus apparently wasted. By the increase of friction, eddy, and shock, heat is produced. If the fan and its environment were absolutely non-conductive, this would expand the air, and velocity would be obtained. To a limited extent this does occur, but the greater part of the heat is conducted from the air by the metal work of the fan, etc., and hence the loss of energy, which, converted into heat, not only does not assist the air-current, but, reaching the bearings, increases their friction, and so still further diminishes the efficiency of the fan.

In the application of axial fans, it is advisable with the majority to allow a very free access for the air to approach the fan, that is, the duct through which the air is led to the fan should gradually decrease to the size of the fan. With the Blackman fan this point is of vital importance, indeed, this particular fan, to give its utmost efficiency, must have an absolutely free environment of considerable area.

We have now pointed out the leading principles which should govern the design of rotary fans of the usual forms, but the application of these principles to the details of construction demands, if a fan is to be scientifically designed, the employment of mathematical calculations, into which we have, in this column, insufficient space to go fully.

Besides the usual forms of fans which we have considered, numerous more or less fantastic devices have been put forward by various inventors, of which the accompanying diagrams show three examples.

In fig. 29 two three-bladed wheels with cross blades as shown, revolve in opposite directions,

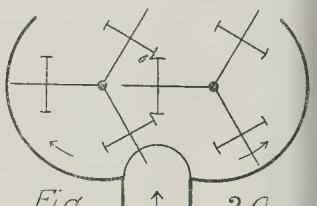


Fig 29

as shown by the arrows, the cross blades being so arranged as to almost touch in their revolution. The air is thus caught up, as it were, between the blades and the enclosing casing, and so a current is produced.

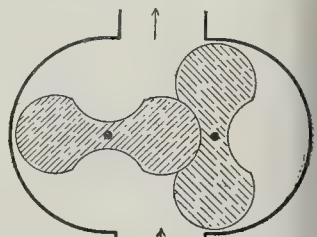


Fig 30

In fig. 30 is a contrivance somewhat similar to the pistonless steam-engine, the operation

being, of course, the converse of that of the engine. In the latter the steam causes the spindles to revolve, whereas in the ventilating apparatus the revolution of the spindles imparts motion to the air.

In fig. 31 is shown a hexagonal drum D, which revolves on its own axis, about the main

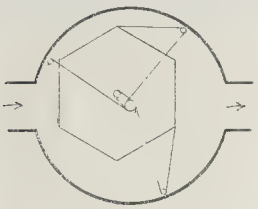


Fig 31

axis of the apparatus, and so moves the clappers C through a path of increasing and decreasing width, thus producing a current of air in the direction of the arrows.

These various forms of apparatus have for their object the avoidance of the adverse currents, to which reference has already been made as so frequently accompanying the action of the more regular forms of fan. The ingenuity, at least, of their designers, as of many other examples merits recognition, though the practical utility of the inventions is hardly commensurate therewith.

OBITUARY.

MR. W. J. HALL.—Mr. W. J. Hall, architect and surveyor, St. Helens, died very suddenly at Prescot on the 24th ult. Deceased, who was sixty-one years of age, and a native of Newcastle-on-Tyne, came to Lancashire in connexion with the extension of the Prescot Workhouse some twenty years ago, and ultimately commenced business in St. Helens.

GENERAL BUILDING NEWS.

NEW FREE CHURCH, EDINBURGH.—In 1860 a lady named Barclay, residing in Edinburgh, bequeathed a sum of 10,000*l.* to the Free Church to be employed in the erection of "a church worthy of the cause" in that city. An excellent site was secured at the north-west angle of Bruntsfield Links, and architects were invited to send in designs. Those submitted by Mr. F. T. Pilkington were preferred and carried out. A new hall is to be built in connexion with this church at a cost of 4,000*l.* It will have an elevation towards Bruntsfield Links and be capable of accommodating 375 persons. The architects are Messrs. Sydney Mitchell & Wilson, Edinburgh.

NEW R. C. SCHOOLS, SHREWSBURY.—The foundation stone of a new Roman Catholic school was laid at Shrewsbury, on the 14th ult., by the Duke of Norfolk. The new building will adjoin the present school near the Roman Catholic Cathedral. The cost will be about 2,500*l.*, and the accommodation is for 450 children. The plans have been prepared by Mr. E. Kirby, Liverpool, and the contractor is Mr. E. Whittingham, Newport, Salop.

VICARAGE, ST. BARNABAS', WARRINGTON.—The Ecclesiastical Commissioners have approved of plans which have recently been submitted to them for the erection of a vicarage for the parish of St. Barnabas, Warrington. Messrs. Pierpoint and Fraser, of Warrington, are the architects for the structure, which will be erected on a site on the north side of the church, at a cost of about 1,500*l.*

RESTORATION OF LINKINHORNE CHURCH.—The parish church of Linkinhorne, Cornwall, was re-opened on the 14th ult. Built in the fifteenth and sixteenth centuries, on the site of a Norman church, it had suffered from neglect and bad treatment, chiefly in the last century, and was in a deplorable condition when the restoration which has just been completed was begun about a year ago. Drawings and specifications were prepared by the architects, Messrs. Hine & Odgers, for taking down and rebuilding the south arcade, for the restoration of the old roofs of nave and aisles, and for a new roof of oak to the chancel, the old one having been found to be rotten; for the removal of the deal seats and gallery, and the opening up of the tower arch; for providing oak stalls in the chancel and oak seats in the nave; and for removing all internal plaster from the walls, and dressing and pointing the masonry throughout. These and other works have now been carried out. The font,—the most ancient feature of the church,—now stands in the centre of the cross formed by the north and south porches, the tower, and the nave. Only two of the original carved benches of the fifteenth century remain, and are in a very decayed condition. New oak benches have been substituted for deal pews. The passages of the nave and aisles have been paved with the old memorial stones, laid as nearly as possible in their original positions, and new slabs of Delabole slate. The chancel is paved with tiles. A three-light window by Mr. Fouracre has been placed in the north aisle in memory of a parishioner. The window was erected by Messrs. E. and John Kittow. During the restoration of Linkinhorne Church there was discovered a fresco on the wall of the south aisle. On the removal of the plaster at the south-east end of the same aisle there was brought to light an arched and cusped piscina. In repairing the walls of another portion of the church a fragment of a large Norman capital was discovered. The contractor for the restoration was Mr. Isaac Rosekilly, of Gunnislake; the clerk of works, Mr. J. Rowse; Mr. Hems, of Exeter, made the carved stall ends; all the new glazing and the decoration of the nave roof timbers have been executed by Messrs. Fouracre & Son, Stonehouse, Plymouth; the new five-light east window of the chancel, a plain reredos below, and the east gable coping and cross, all of Polyphant stone, were made from the working drawings of the architects, by Mr. Nicolls, of Lewannick.

ST. MATTHEW'S CHURCH, BOLTON.—On the 12th ult. the new (vestry of St. Matthew's Church, Bolton, erected by the vicar's warden (Mr. Thomas Holmes), of Hayward Leigh, was formally opened by the donor. The vestry and parish room is octagonal in form, measuring 21 ft. 6 in. across the centre of the room. Its height is 12 ft. 6 in. from the floor to the eaves, and is covered with an open-timber pitch-pine roof rising to 18 ft., and surmounted by an ornamental ventilated turret. The architects were Messrs. Stead & Morris, of Bolton.

NEW WESLEYAN SCHOOL, LEEDS.—On the 18th ult. the memorial-stones of a Sunday school in connexion with the Dewsbury-road Chapel, Leeds, were laid. The new building is being erected on land adjoining the chapel, from the designs and under the superintendence of Mr. George F. Danby, architect, Leeds. It comprises a school or assembly room, 65 ft. by 34 ft., with recessed platform at one end, lighted by clearstory windows at the sides over the class-rooms, and large windows at each end. This room has an open timbered roof, 25 ft. high in the centre, and is capable of seating 500 persons. Separate entrances for the boys and girls are provided, with tiled lobbies and glazed screens. On the sides of the assembly-room are eight class-rooms, also a ladies' sewing-room. An infants' room is provided, 25 ft. by 17 ft., with raised gallery; in the basement three additional class-rooms, also kitchen, apparatus-room, and all other conveniences are arranged. In consequence of the fall of the ground, the ceilings of these rooms will be 7 ft. above the land outside. Each room is ventilated by fresh air being admitted by expanding tubes and drawn out by air-flues conducted into an exhaust ventilator; and the heating, in addition to open fireplaces in some of the rooms, will be on the low-pressure system. The building is being built of pressed bricks, with Harehill's stone dressings. It is in the Classic style. The whole of the internal woodwork is of varnished pitch-pine. The cost of the building will be about 2,400*l.*

PROPOSED ALTERATIONS ON THE CASTLE, INVERNESS.—Plans have just been prepared for additions and alterations which it is proposed to carry out on the Castle, Inverness. The plans, which have been prepared by Messrs. Ross & MacBean, provide for the erection of a building on the vacant space of ground between the County Buildings and the Jail, in which rooms for the Sheriff, the Procurators, and other officials will be provided, and the enlargement of the Governor's house and other alterations. The improvements are estimated to cost 1,500*l.*, and new cells are to be provided at the porter's lodge at a cost of 300*l.*

CONSECRATION OF A NEW CHURCH AT MELINCRYDDAN.—On the 23rd ult., the Church of St. Catherine, which has been erected at Melincryddan, was consecrated by the Bishop of Llandaff. The architects of the church were Mr. D. M. Davies (of Neath) and Mr. Carter, of the firm of Seddon & Carter. The site was given by Mr. Edward Evans, of Eaglesbush. The church is of modern architecture, and affords accommodation for 500 persons. The cost was about 3,000*l.*

PROPOSED NEW ASYLUM FOR LINCOLNSHIRE.—The question of the increase of lunacy in Lincolnshire, and the provision of more accommodation for patients, has occupied the attention of the managers of the Lincoln County Asylum for a long period. A considerable number of patients are now boarded out in Yorkshire. The Lunacy Commissioners have visited the institution, and report that either a new annexe must be built or a new asylum in the southern part of the county. They favour the latter scheme. A committee of the managers, specially appointed for the purpose, report in favour of the erection of a new asylum in the south of the county at an approximate cost of 72,000*l.*, to accommodate 400 patients. The addition of a new annexe would, it is estimated, cost 63,000*l.*; but better and cheaper water could be procured elsewhere. It is also said that the old institution requires an expenditure of 12,000*l.* to place it in a satisfactory condition.—*Leeds Mercury.*

PROPOSED EXTENSION OF THE BIRMINGHAM SCHOOL OF ART.—The Museum and School of Art Committee of the Birmingham City Council, recently approved the sketch plans of Messrs. Martin & Chamberlain for the extension of the School of Art on the Cornwall-street frontage, and instructed the architects to prepare detail drawings for submission to the City Council, with a view to the work being speedily commenced. The sketch plans just approved provide for a block of buildings of two floors and a basement—the elevation of the existing buildings is three floors and a basement. The new block will contain on the ground floor an examination-room 65 ft. by 27 ft., a light-and-shade-room 52 ft. 6 in. by 27 ft., all pointing to Cornwall-street, and behind an elementary-room 45 ft. by 27 ft., and rooms for the head-master and the assistant-masters. The present light-and-shade-room and the lecture-room, measuring respectively 39 ft. by 27 ft. and 27 ft. by 25 ft., will be thrown into one and used as a lecture-room, and the head-master's-room will be converted into a library. On the upper floor to the Cornwall-street front there will be an architecture and building construction-room, and a cartoon and fresco-room corresponding in area to those on the first floor, and in the rear will be a room for painting or antique classes 45 ft. by 27 ft., a ladies' common room 24 ft. by 18 ft., and a studio for the head-master. The present head-master's studio will be converted into a room for the Chairman of the School of Art Committee. The plans for the basement provide for extensive redistribution of space. The present architecture and building construction room, promoted to a higher floor, will be thrown into the machine-drawing room, and the enlarged room—64 ft. by 27 ft.—will be used as the modelling room, and the present modelling department will become the machine-drawing department. In the new building accommodation will be found for the modelling and casting department in a room 65 ft. by 27 ft., two art laboratories, one 33 ft. by 27 ft. and the other 32 ft. by 27 ft., and improved arrangements for the servants and stores. The estimated cost of the new buildings is about 13,000*l.*

A NEW WELSH WATERING-PLACE.—On the 25th ult., Mr. W. Gregson, of Bolton and Southport, Chairman of the Ynyslas Estate Company, laid the foundation-stone of that new watering-place on the west Welsh coast. A contract has already been let to Messrs. Farnsworth, of Manchester, for the erection of a number of semi-detached villas, and a system of sewerage has been completed. The Ynyslas estate, which has been acquired by a Lancashire Company, comprises over 1,100 acres, 260 of which have been laid out for building purposes. A considerable portion adjoins Cardigan Bay and the estuary of the river Dovey.

NEW BATHS AT NEWTON HEATH.—The new Corporation Baths which have been erected at Newton Heath, Lancashire, were formally opened on the 22nd ult. by the Mayor of Manchester (Alderman J. Mark). The frontage of the baths is 189 ft. in length towards Wellocks-street, from which a central entrance gives access to the first-class department on the right and the second-class on the left. The latter contains a swimming-bath 75 ft. in length and 24 ft. in width, surrounded by a gallery for spectators, and twelve slipper baths. The first-class swimming-bath is 45 ft. by 24 ft. There are six first-class slipper baths for men, and three first-class and three second-class for women. The residence for the superintendent is in the central block, and in the rear are the laundry, drying-stove, store-room, boiler-house, and other rooms. The total cost of the undertaking was 6,557*l.* The designs for the buildings were selected in competition, and were by Mr. Lawrence Booth; and the works have been carried out under the supervision of Messrs. Booth and Chadwick, architects, of Manchester. Messrs. W. Southern & Sons, of Salford, were the contractors for the building; and Messrs. Elliott, Olney, & Co., of Manchester, for the engineering.

CHURCH OF ST. DAVID'S, BEAUFORT, BRECONSHIRE.—The Church of St. David's Beaufort, has just been opened by the Bishop of Llandaff. The church accommodates 253 adults, and is built of native stone, with Ebbw Vale terra-cotta dressings. There is an open timber roof, boarded and felted under the slating. The style adopted by the architects, Messrs. Halliday and Anderson, of Cardiff, is a simple treatment of the Decorated period. The contract cost of the church was 975*l.* During the progress of the works several additions have been made to the church, including a stone pulpit, and a font. The three-light east window is filled with stained glass, in memory of the late Vicar Morgan. Mr. Taylor, of London, carried out the architect's designs for the windows. The contractor was Mr. John Haines, of Cardiff.

PRESBYTERIAN CHURCH, SUNDERLAND.—The foundation-stone of the John Black Memorial Church, which is to be erected in North Bridge-street, Sunderland, was laid on the 23rd ult. by Mr. James Westoll. The new church will be built on the site of the old North Bridge-street Church, and will be designed in the early Gothic style, with nave divided from side aisles by arcading, and with large choir and organ chamber to the south. There will be two entrances from the main street,—one from the tower, and the other by a special porch, with cloak-room opening off. A stone spire will be erected at the south-west corner, with a height of

140 ft. The building will be of stone. The contractor is Mr. Robert Allison, of Whitburn, and the architect is Mr. William Lister Newcombe, of Newcastle. The outlay will be 8,000*l.*

NEW SCHOOLS, HEANOR.—On the 25th ult. the foundation-stone of a new boys' school, to be erected in Mundy-street, Heanor, Derbyshire, was laid by Miss Corfield. The site covers an area of 363 square yards, and is in almost the centre of the town. Mr. J. Holbrook, of Heanor, is the architect, and Mr. G. Oldershaw is contractor.

SANITARY AND ENGINEERING NEWS.

THE LONDON WATER QUESTION.—The Select Committee of the House of Commons, presided over by Sir Matthew White Ridley, sat for the first time on Tuesday to consider the London Water Bills. It had been decided at a preliminary meeting to consider first the London Water Commission Bill, proposed by the Corporation of London. Having heard the statements of counsel, the Committee, without any evidence being called, refused to pass the preamble of the Bill, on the ground that the water question could not be satisfactorily dealt with by a public authority merely having powers to promote Bills in Parliament. We gave some particulars as to the provisions of this Bill in the *Builder* for April 4 last, p. 266.

WATER SCHEME FOR COLWYN BAY.—Application having been made to the Local Government Board to issue a Provisional Order forming the Urban Sanitary Districts of Conway, and Colwyn Bay and Colwyn, and the Rural Sanitary District of Conway Union, into a united district for the purposes of securing a common water supply for such united district, Mr. Samuel Joseph Smith, C.E., one of the Inspectors of the Local Government Board, attended at the Town-hall, Conway, recently, to hold an inquiry into the subject. The chairman of the Joint Water Committee (the Rev. W. Venables Williams) explained that, not having to lay their pipes in any other union, no Act of Parliament would be required. The lake from which the water was intended to be drawn was 250 acres in extent, and the water was declared by Mr. Campbell Browne, after analysis, to be pure and soft. Mr. T. B. Farrington, the engineer of the new scheme, explained the nature of the works. The population to be supplied he estimated at 20,000, though he had provided for supplying 40,000. The gathering ground of the lake extended over 1,100 acres. The height above the sea level was 1,164 ft. As showing the adequacy of the supply, Mr. Farrington stated that during the recent dry weather 300,000 gallons of water ran over the outlet of the lake per day. The course of the pipes would be from the end of the lake, through Doecarrog, Talybout, Tynyeroes, to Conway. There it would be necessary to cross the river, and he had two schemes for effecting that, (*a*) to carry the pipes along the present suspension bridge, or (*b*) to suspend the pipes between the suspension bridge and the tubular bridge with steel cables, 7 ft. apart, and braced together. After crossing the river, the new main would join the existing main at Sarn Mynach on the main road to Colwyn Bay. He estimated the cost of the works at 16,200*l.* It having been pointed out that in the event of a purchase of the lake, the proprietors would require 1,500,000 gallons per day for a turbine, Mr. Farrington said that there would still be sufficient to supply a population of 40,000 people with twenty gallons per head per day for six months, without any water going into the lake at all.—There was no opposition to the scheme, and the inspector declared the inquiry closed.

EMBANKMENT WORKS AT SOUTHPORT. — The Scarisbrick trustees have just commenced an undertaking for enclosing the alluvial land on the shore of the Ribble estuary by means of a large embankment, which will extend from Hundred End to Crossens, a distance of about three miles. The area to be enclosed is about 1,000 acres, and the estimated cost is between 20,000*l.* and 30,000*l.*

TEIGNMOUTH WATER SUPPLY.—The Local Board of Teignmouth has decided to carry out a comprehensive scheme of water-supply for the wants of the town. In the summer months some difficulty is experienced in providing an ample supply to the inhabitants and visitors, and the existing works, from which the supply is at present derived, are incapable of yielding an increased volume. Mr. H. Bertram Nichols, C.E., of Birmingham, has been called in to prepare a scheme and to report.

LANDING-PIER AT MUTTON COVE, DEVONPORT.—The landing-pier at Mutton Cove, Devonport, which has been in course of construction for several years past, has just been completed. The pier has been constructed from the designs of Mr. J. C. Inglis, C.E., the engineer, by Mr. A. R. Denham, of Plymouth. A considerable amount of dredging was necessary before the foundations could be laid, and a large portion of the material to be excavated consisted of cross-grained rock. The pier juts out from the quay wall at the bottom of James-street, its sea-arm and the approach roadway forming a broad T. It consists of concrete in blocks and in site, and is so constructed as to allow steamers to come alongside at any state of the tide. The sea-arm is 75 ft. by 20 ft., its outer edge being 50 ft. from the quay wall, and the approach road has a width of 14 ft. The sea front is furnished with a flight of granite steps, and similar steps are provided in the two bays formed by the juncture of the sea-arm with the approach road. The faces of the pier have a batter of 1 in 12 for the purpose of giving greater solidity to the structure and greater resistance to the strong currents which run at this part of Hamoaze. The surface of the sea-arm is paved with granite sets, and is protected by stanchions and galvanised iron chains. At each end are cast-iron bollards for mooring purposes. The pier will be lighted by one of Sugg's 25-candle-power lamps, and a caretaker's office and waiting-rooms are about to be erected on the site of the old fishermen's hut immediately adjoining. The building of the pier has afforded an opportunity of effecting an improvement in regard to the drainage of the district. Rock concrete tubes have been carried through the pier, and, the top of the discharge tube being 3 ft. below low-water spring tides, the nuisance hitherto arising from a continual lodgment of sewage at certain states of the tide has been avoided. This portion of the undertaking has been carried out by workmen in the Borough Surveyor's department under the supervision of Mr. Burns and Mr. T. Dennis, foremen of works.

STAINED GLASS AND DECORATION.

NEW WINDOWS, ST. NINIAN'S EPISCOPAL CHURCH, GLASGOW.—Two new windows were recently unveiled in the apse of this church, completing the group of three above the altar. The centre window contains the representation of the Crucifixion in the one light and of the angels and the women at the empty sepulchre in the other. The first of the two new windows, which have also two lights each, is placed to the left of the centre, and has for its subjects the Nativity and the Epiphany. The pictures occupy almost the whole space of the window, and are placed under canopy or tabernacle work, and rest upon architectural bases. The other window, on the right of the centre, represents the Ascension of Our Lord and Pentecost. Messrs. Heaton, Butler, & Bayne, of London, designed and executed the windows.

MEMORIAL WINDOW, TANFIELD CHURCH.—There has recently been dedicated a stained-glass window in Tanfield Parish Church, Durham, to the memory of the late Mr. Robert Clark. Mr. C. E. Kempe, of London, was entrusted by the committee with the work. The window is a two-light one, and shows figures of SS. James and Andrew, with scenes below showing the calling of the sons of Zebedee, and the call of S. Andrew, with canopies and tracery.

MEMORIAL WINDOW, KIRKCALDY.—A stained-glass window has just been erected over the font in St. Peter's Church, Kirkcaldy, to the memory of the late Dean. The subject is the Good Shepherd. The window is from the studio of Messrs. Wailes & Strang, Newcastle-on-Tyne.

STAINED GLASS WINDOWS, SILVERDALE CHURCH. —The eight clerestory windows,—four on the north side and four on the south,—in Silverdale Parish Church have been filled with stained glass, all the subjects, with one exception, being taken from the Bible. The work has been done by the firm of Messrs. Shrigley & Hunt, of Lancaster.

THE CHURCH OF ST. ANNE'S-ON-THE-SEA has just been provided with a stained-glass window, from the studio of Messrs. Burlison and Grylls, of London. The window, which illustrates the "Children of the Bible," is placed in the north transept of the edifice.

FOREIGN AND COLONIAL.

FRANCE.—The Municipal Council of Dunkerque on the 24th ult. decided to build a new Mairie on the north-east side of the Place de la République, at an estimated cost (including site) of 1,800,000 fr. (about 72,000*l.*). Four other sites were proposed, but they were all deemed to be too costly, the schemes in connexion with them ranging in estimate from 2,150,000 fr. to 2,550,000 fr. One proposal was to build on the east side of the Place Jean Bart,—the finest and largest *place* in the town, but the cost of this project was estimated at 2,375,000 fr. (about 95,000*l.*), and it was not thought that the financial resources of the town would permit of such a large expenditure. The Place de la République is a smaller and more irregular-shaped *place* than the Place Jean Bart. The committee on whose report the Municipality have acted suggest that plans could be obtained in competition, but hints that as two of the local architects (names not mentioned) are distinguished pupils of the Ecole des Beaux-Arts, it would not be necessary to look elsewhere for an architect. We extract these particulars from the *Phare de Dunkerque* of April 26.——It is announced that the French exhibition at Moscow will probably open on May 7.——The palace of the University at Rennes has been robbed. The thieves have carried off a number of medals and pictures of great value, especially some remarkable pictures of the Flemish school.——The Museum at Compiègne has acquired a fine picture by M. Edmond Yon, "The Old Oak at Cernay," presented by the Baron Alphonse de Rothschild. ——The President of the Republic has presented to the museum at Versailles his medallion portrait by M. Chaplain.——M. Duplessis, curator of engravings at the Bibliothèque Nationale, has been elected member of the Académie des Beaux Arts in place of the late Albert Lenoir.——The art exhibition at Dunkerque will open on June 1, and close on September 30 following.——Some evil-disposed persons have carried off from the Hôtel de Ville of Limoges two Gobelin's tapestries which were among the oldest and finest in the provinces; one representing Narcissus looking into the fountain, the other Apollo killing the Python ——The new Faculté de Médecine to be created at Marseilles will occupy the Pharo Palace. The expenses of the adaptation, &c., of the building are estimated at 350,000 francs.——A committee has been formed to erect at Carcassonne a monument to the poet André Chénier.——On May 24 there is to be inaugurated at Dax a statue to the memory of Borda, the mathematician.—— The town of Grenoble proposes to erect a monumental statue to a poet of the eighteenth century, Gentil-Bernard.——M. Falguière, the sculptor, has completed the model of the monument which is to be inaugurated next year, at Chambéry, to commemorate the annexation of Savoy to France. The monument will be surmounted by a figure of a female in Savoyard costume, pressing to her heart the French Standard.——The parish church of Estrelles, in the Arrondissement of Vitré, one of the finest churches in the country, very recently restored, has been completely destroyed by fire.

BERLIN.—The Emperor and Empress both visited the exhibition buildings in the Landes-Ausstellungspark on the 27th ult., and made a preliminary inspection of those groups of the International Art Exhibition in which the hanging committees had completed their work. The extensive Spanish group set an example as regards punctuality, the finishing touches having been done last week.—The new Moltke Bridge, a monumental five-span stone bridge over the river Spree, was opened on the 28th ult., having been finished in great haste for the purpose of letting the funeral cortége of the late Field-Marshal pass over it. The architectural features and sculptural ornaments were draped in black for the occasion, and the gas candelabra were kept burning during the day.

STUTTGART.—The competition for a model for the proposed monument to the deceased Emperor William I. has been decided, the winner being the Berlin sculptor, Neckelmann. The number of candidates was 26. The cost of the monument is not to exceed 8,000*l.*

MISCELLANEOUS.

ENGINEERS' AND BUILDERS' EXHIBITION AT ISLINGTON. — Under the high-sounding title of "International Exhibition of Machinery, Manufactures, Appliances, and Inventions incidental to Engineers, Electricians, Builders, and Ironmongers," the ground-floor area of the Agricultural Hall at Islington has been about half-filled this week with a miscellaneous exhibition which has been very far from including any display at all commensurate with its name. The exhibition opened on Thursday, the 23rd ult., too late for notice by us last week, and will close this Saturday, May 2, so that it is not necessary to speak of its contents at any length. Gas-engines were better represented than any other item, and besides Crossley's "Otto," Andrew's "Stockport," and other well-known engines, we noticed a newcomer in the shape of the "Campbell" gas-engine, which appears to be a very good type of engine. It is exhibited by the Campbell Gas-Engine Co., Halifax. The Blackman Ventilating Co. exhibit the "Blackman" fan. In heating apparatus, Mr. W. G. Cannon, of London-road, Southwark, exhibited his excellent "radiators"; and Messrs. Rosser & Russell, of Charing-cross exhibited a very complete collection of radiators and other heating apparatus, and a good hydraulic dinner-lift. Messrs. D. Hulett & Co. made a good show of gas-fittings, &c. Messrs. F. Jones & Co. exhibited "silicate cotton" or "slag-wool," in its various applications to fire-proofing and sound-proofing. Messrs. Lewis & Lewis exhibited two or three small machines for joiners' use, and the "Brixton" gear friction hoist. The Reversible Window Company, of Hart-street, Bloomsbury, exhibited their admirable appliances. There were several other exhibits more or less pertaining to the building trades, but none of novelty or of special note, if we except Mr. Dan Rylands's glass-lined metal-piping for water-service pipes, electric lighting mains, &c.; Edison's "Mimeograph," a very ingenious apparatus for reproducing writings, plans, or sketches; the "Homacoustic" speaking-tube, which embodies some desirable improvements; and some very ingenious folding trucks (one of them suitable for a small jobbing builder's use), exhibited by the Patent Folding Truck and Carriage Company, Swansea.

NEWCASTLE AND GATESHEAD BUILDERS' ASSOCIATION.—On the 23rd ult., says the *Newcastle Journal*, at one of the largest meetings of contractors and master builders held in Newcastle for many years, it was unanimously decided to form an association, to be styled the Newcastle and Gateshead Builders' Association, and the following officers were elected:—President, Mr. W. C. Tyrie; vice-president, Mr. John Ferguson; treasurer, Mr. Brims; secretary, Mr. James Forsyth. The following committee was also appointed: Messrs. Walter Scott, Haswell, Nevison, Lowry, and Pringle.

NATIONAL REGISTRATION OF PLUMBERS.—The third session of the plumbers' class in the Technical College, Bath-street, Glasgow, terminated last week. The District Council for Glasgow and the West of Scotland attended, — the vice-president of the Council, Mr. John Gordon, architect, being in the chair. Addresses were delivered to the students by the chairman, Dr. Eben. Duncan, Mr. David Thomson, architect (the convener of the Technical Education Committee of the Council), Professor Jamieson, Mr. W. P. Buchan, and Mr. A. M. Scott, the secretary of the Council. The prizes will be presented at the beginning of next session. The competitive essay is on the best method of carrying out the drainage of a suburban villa.——The quarterly court of the Worshipful Company of Plumbers was held on Saturday afternoon last at the Guildhall. The Master (Mr. W. H. Bishop) presided. The first business was the admission of Dr. Farquharson, M.P., to the freedom of the company.—Sir Algernon Borthwick then, in the name of the Court, welcomed their youngest member. This honour, he said, fell to him as one of the junior members of the Court, and it was a very agreeable task to have to welcome Dr. Farquharson to so excellent an institution. As a member of the Select Committee on the Metropolitan Water Bills he should make it a point to see whether a clause could not be introduced carrying out generally the excellent regulation of the New River Company, upon whose work none but registered plumbers were engaged. The work of the guild was not only of great importance to the community, but would be to the advantage of the workman, whose greater efficiency would secure for him better wages.—Dr. Farquharson thanked the Court for the honour they had done him, and, through him, the town of Aberdeen and his constituency.—The Clerk (Mr. Coles) read a list of thirty-seven public and registration meetings which had been held since the last Court between the extreme limits of Penzance and Aberdeen; and the Warden and Mr. Smeaton having reported upon the London and provincial examinations, the business of the Court was concluded.

POPULAR SCIENCE LECTURES.—At the Royal Victoria Hall, Waterloo Bridge-road, S.E., during May, the lectures will be as follows:—Tuesday, May 5, Dr. W. D. Halliburton, on "Skin and Bones"; Tuesday, May 12, Mr. F. H. Blandford, on "Silk and Silkworms"; Tuesday, May 19, Rev. J. Freeston, on "Galileo"; Tuesday, May 26, Mr. W. North, on "The Physiology of a Dinner."

NEW CEMETERY, PAISLEY.—The new public cemetery at Hawkhead, Paisley, was recently opened. The site of the new cemetery has a gradual slope rising to an eminence of about 50 ft. from the main road at Hawkhead. The cemetery is in the east end of the town, on the outskirts of the burgh. In the new burial-ground, which comprises 40 acres, 17 acres have only meantime been laid off, containing about 17,000 lairs. The entire cost of the undertaking, which has been carried out under the supervision of Mr. Sharp, master of works, will be about 20,000*l*.

COMPENSATION FOR DAMAGE BY BRINE-PUMPING.—A Select Committee of the House of Commons have arrived at an important decision affecting the salt industries of Cheshire and Worcestershire, and the owners of buildings in that district. In the salt districts brine-pumping has for many years past been practised for the getting of salt, with the result that extensive and ever-increasing subsidences of land have taken place throughout the neighbourhood of the pumping operations. Roadways are split up, pools have been formed where there should be solid, level ground, houses and other buildings have sunk to many feet below the natural surface, and been thrown out of the perpendicular in a grotesque and dangerous manner, being frequently only saved from collapse by extemporised supports. For all the damage and loss thus occasioned, owners of the property have had no remedy, for as the pumping goes on all over the district, and subsidences sometimes occur some miles away from a pumping-shaft, it is impossible to fix the responsibility upon any one pumper. The grievance has been increasingly felt during the last few years, and, with a view to finding some relief, Mr. Brunner, M.P. for Northwich—where, with Winsford, most of the subsidences have taken place—introduced a Bill this Session "to provide compensation for owners of property suffering through the subsidence of the ground caused by the pumping of brine," and this Bill Mr. J. Gathorne Hardy's Committee have this week passed. The Bill provides that ("as no effectual remedy by action or otherwise existed for the damage and loss thus caused"), on the application of property owners having an aggregate rateability of 2,000*l*., a compensation district should be declared, the limits of such district to be fixed by the Local Government Board. A district being thus formed, a Compensation Board should be constituted who should be empowered to establish a compensation fund by levying a rate not exceeding 3d. per 1,000 gals. of brine pumped in a year upon the pumpers, from which fund sufferers from the process within the district should be compensated.

LECTERN, TOTNES.—The execution of the new lectern (oak) for Brooking Church, Totnes, has been entrusted to Messrs. Rashleigh, Pinwell & Co., of Plymouth, and is to be carried out from the design of Mr. Edmund Sedding, who has now joined the firm.

UNIVERSITY COLLEGE LECTURES.—On Monday last Professor Bendall, M.A., gave the first of a short series on the Mediæval Archæology of the East, his special subject being the monuments of Buddhism in India. He stated that the Vedic Aryans lived in villages cleared from the jungle, and built of wood. He then discussed the word *pur*, the termination of so many Indian names of places, giving it as his opinion that it must be rendered "fortress," and not "city," else some of the passages in the Rig Veda would be absurd. Fergusson states that the Indians did not build in stone till after the Greek invasion. They could certainly work in iron, as the gates of Delhi show. We are not to infer a low state of civilisation because of the wooden buildings of the ancient Hindus, any more than we should conclude that from the beautiful wooden churches of old Norway. In the lower parts of India, near the rivers and the sea, the houses were of wood, but in the higher places they were almost always built of brick or mud. The lecturer then spoke of the *topes*, an Anglo-Indian corruption of the Sanskrit *stupa*, a word for the Buddhist buildings intended for the preservation of relics, and he said that in relic-worship Buddhism (so far from us in many things) and Christianity touch each other. He instanced the tope at Sanchi, whose dome is 160 ft. high, while the diameter is 140 ft. Above the dome is the *liti*, meant to represent one of the Buddhist heavens, in which the chief gods of the system, the *devas*, are to be seen offering flowers, &c. Professor Bendall thinks the gate of the tope at Sanchi cannot be later than 100 A.D., and said that the same liberty which had been taken in the stone and wood of our cathedrals by the decorators had been taken in this building, as in addition to scenes in Buddha's life there are representations of men drinking, &c. The next lecture will refer to the pillars and cave temples of India.

LIVERPOOL ENGINEERING SOCIETY.—The eleventh ordinary meeting of this Society for the present session was held at the Royal Institution, Colquitt-street, on the 22nd ult., Mr. F. Hudleston, Assoc.-M. Inst. C.E., President, occupying the chair. After the usual routine business, Mr. George Farren, Assoc.-M. Inst. C.E., read a paper entitled "Denudations at Aber-Menai, Anglesey." The paper dealt with the question of the washing away, by the sea, of a large body of sandhills which previously formed a natural breakwater across the entrance of the Menai Straits, near Carnarvon, and with the engineering details of the various schemes which had been adopted by the Carnarvon Harbour Trustees for the preservation of this natural breakwater. Mr. Farren illustrated his paper with a large number of diagrams and lantern views. The discussion upon the paper was adjourned to the next meeting.

THE PUBLIC HEALTH (LONDON) LAW CONSOLIDATION AND AMENDMENT BILLS.—We are obliged again to hold over, for want of space, the suggestions made by the London County Council as to these Bills.

CAPITAL AND LABOUR.

STRIKE AT THE IMPERIAL INSTITUTE WORKS.—We are informed that the bricklayers at the above struck work without notice at eight o'clock on Wednesday, the 22nd ult., against one of their number, whom the others were trying to force to join their society, and as the contractors,—Messrs. Mowlem & Co.,—declined to accede to their demand that this man should be discharged, the men refused to continue their work, and were paid off accordingly. The man against whom the action was taken continued at work with two or three others during the day, but, on leaving in the evening, he was knocked down, and would, there is no doubt, have been very badly maltreated had it not been for the intervention of police and others. He has not since returned to his work. On the following day (so we are informed) two delegates from the Operative Bricklayers' Society waited on the firm, and expressed their regret that the men should have taken the law into their own hands in such a way, stating that it was entirely against the Society's rules that they should strike against a non-unionist, and hoped that the men would be allowed to resume their work. On Monday morning last the works were accordingly opened again, but the bricklayers refused to go to work unless all those who had struck were reinstated as a body. As the whole of the number were not required, this could not be done, and the men, therefore, are still out on strike.

THE THREATENED STRIKE OF CARPENTERS IN LONDON.—According to the *Daily Chronicle* of Thursday, the Secretary of the London United Trade Committee of Carpenters and joiners affirms that it is possible that they may be able to avert a strike, as they are to have an interview with the employers before the end of the week.

THE WARRINGTON MASTER BUILDERS AND THEIR MEN.—At a meeting of the master builders of Warrington and the operative bricklayers, held at the Masonic Chambers, Sankey-street, on the 23rd ult., the matter as to an advance of wages and alterations of working rules, of which six months' notice had been given by the men, was amicably and satisfactorily arranged, the advance of ½d. per hour being conceded and the working hours during the winter months reduced, so that time is only paid for which the men can really work, as under the present working rules a considerable number of hours are paid for on outdoor work which the men cannot possibly see to do. The alterations will date from May 18.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

7,406.—MOULDING AND PRESSING TILES: *W. West.*—The principal object of this invention is to enable cleaner corners and surfaces to be left on the moulded articles. The invention also facilitates the dies parting from the moulded material; this is done by providing the cutting dies with "sleeves" controlled by springs which slide one against the other.

7,707.—FLUSHING WASH-BASINS, &c.: *D. Bostel.*—The nozzle is branched so as to curve in a double horn around the basin, and the pipe is perforated so as to flush out all parts of the basin or pan.

8,512.—STAIR-TREADS: *R. Leslie.*—The stair-treads, which are the subject of this patent, consist of grooved pieces of wood into which are inserted pieces of India-rubber, either round or square.

13,438.—SQUARES: *C. L. Bronk.*—This invention relates to carpenters' steel squares, and the object of the improvement is to construct the joint between the two arms so that the strain upon the pivotal joint may be materially reduced, and the wear of the arms and throwing them out of true measurement prevented. This is effected by providing the movable arm with a recess and guide, so that the square may not be strained, but be exact.

2,865.—PAVING AND ROOFING COMPOSITION: *H. T. Williams.*—According to this patent, asphalt is so treated that the bitumen therefrom is obtained in a pure or nearly pure state; then an emollient is mixed with the product,—such, for instance, as india-rubber,—so that it can be spread into sheets for roofing purposes or remelted and treated or mixed with earthy material to form pavements. Lard or lard-oil is used to enable the compounds to amalgamate.

3,147.—SEWER-PIPES: *J. G. Meyer.*—It is claimed that by this invention an improved coupling is used, the union having a sleeve with internal grooves or slots; studs enter these, and effectually connect the sewer-pipes and the discharge-pipes.

NEW APPLICATIONS FOR PATENTS.

April 13.—6,257, W. Gibson, Kilns for Glazed and Enamelled Clay Goods.—6,274, J. Lee, Door or Window Fastener.

April 14.—6,371.—W. Thompson, Stoves.—6,395, F. Jones, Joint for Soil-pipes, &c.—6,411, H. Baumotte, Chisels, &c.

April 15.—6,419, F. Hall and E. Bruce, Ventilators.—6,429, J. Hartley, Cold Sawing Machines.—6,548, R. Wilson, Blue and Green Pigments.—6,467, W. Munns, Screw-driver.

April 16.—6,512, R. Richards, Stoves and Fireplaces.—6,513, J. Thomson, Ventilation, &c.—6,522, A. Robertson and J. Yule, Chimney Cowl.—6,524, W. Filkington, Kilns for Annealing Plate-glass.—6,545, J. Peyton and O. Rhodes, Ventilator.—6,549, S. Emery, Flushing Drains.—6,559, J. Nicol, Electric Bell-push.—6,565, E. Armitage and others, Painting Machines.

April 17.—6,610, G. Haywood, Ventilators.—6,616, H. & J. Thomas, Fittings for hanging Door Curtains or Screens,—6 630, J. Griffiths, Street Pavements, &c.—6,632, A. Boutcher, Socket or Collar for Stoneware Drain-pipes, &c.—6,647, J. Stott, Window Sash Fasteners, &c.

April 18.—6,683, R. White, White Lead.—6,705, A. Smallwood and H. Fenney, Marbling or Decorating certain Surfaces.

PROVISIONAL SPECIFICATIONS ACCEPTED.

2,591, J. Steen, Construction of Metal Screws for Woodwork, &c.—2,614, A. Howell, Window Sash-Fasteners.—3,966, A. Filcher and H. Loosemore, Ventilators and Ventilating Cowls.—4,300, T. Tyers and O. Barnsdale, Plumber's Joints, and in Apparatus therefor.—4,336, H. Bishop & Son, Construction of Streets, Roads, &c.—4,522, C. Huelser, Brick-Presses.—5,068, F. Quéry, Kilns for use in the manufacture of Pottery, &c.—5,069, A. Smith, Ornamentation of Wood.—5,195, A. Page and G. Way, Prevention of down-draughts of Smoke in Chimneys.—5,203, W. Hughes, Easy Opening and Closing of Windows.—5,331, G. Goldsmith, Fixed and Movable Chimney Cowls. 5 363, D. Nicoll, Construction of Slabs for Road-making.—5,365, R. Jesson and others, Brick-moulds.—5,424, J. Pulham, Construction of Fireproof Staircases, &c.—5,483 H. Nemitz, Mural and other Decorations.—5,772, C. Huelser, Clay-presses for making Tiles &c.—5 787, C. Edwards, Drain-pipes, &c.—5,810, T. Hydes, Hydraulic Cement, &c.—6 039, K. Schoenfeld, Moulding and Pressing Bricks, &c. 6,041, J. Craven, Kilns for Drying and Burning Bricks, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

6,089, J. Eckersley and others, Discharge-valve Apparatus for Water-closets, &c.—7,215, D. Allport, Foundation for Light Buildings, &c.—9 441, H. Schlund, Hinges.—4,765, F. Simonson, Machinery for Handling Logs in Saw-mills.

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Laying out Large Building Estate, North Wales	Jno. Corbett, Esq. M.P.	100l. 30l. 20l.	May 29

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Drainage, &c., of Cemetery, Gildersome, Yorks	Burial Board	*Official*	May 5
Annular Condenser, Gasworks	Clerkenwell Lor. Bd.	do.	do.
*Sewerage and Road Works	Leicester Corporation	do.	do
Eight Houses	Wallsend Co-op. Soc.		do.
Road Metal (2,200 tons)	Woburn Highway Bd.	Henry Platt	do.
Warehouse, Ormeau Avenue, Belfast	Alex. Grabon	Young & Mackenzie	do.
Work at Hospital	Widnes Loc. Bd.	J. S. Sinclair	do.
Alteration and Extension to School, Goodman-street	Burton-on-Trent Sch. Bd.	R. Churchill	do.
Steel Rails, Fishplates, Springs, &c.	India Office	*Official*	do.
Limestone Road Metal	Merthyr Tydvil L. B.	do.	do.
Three-arch Stone Bridge over River Taff at Quaker's-yard	do.	do.	do.
Six houses, Witton Gilbert, Durham	Wm. Logan	J. W. Rounthwaite	do.
Hospital, Wallsend	Wallsend, Willington Quay, and Howdon Joint Hosp. Com.	Wm. Hope	May 6
Widening and Improving Iron Bridge at Mearclough	Bowerby Bridge L. B.	F. Rothera	do.
Iron Packbridge	Biggleswade Highway Bd.	David Mackenzie	do.
Cast-iron Socket Pipes, &c.	Sunderland Gas Co.	*Official*	do.
Alterations and Additions to Cattle Market, Roath	Cardiff Corporation	W. Harpur	do.
Residence, Stables, Coach-house, &c. Penarth		Jacobs & Pickwell	do.
*Broken Granite and Pitchings	Bethnal Green Vestry	F. W. Barratt	May 7
Flint Road-metal (1,450 tons)	Horsham Local Board	*Official*	do.
Alterations to premises		Bernard & Drake	do.
Covering Plymouth Lent with concrete	Corporation	Geo. D. Bellamy	May 8
*Supply of Macadam Spalls	Brighton Twn. Council	F. J. C. May	do.
*Painting, &c. Works at Schools, Upton Park	St. George in the East Guardians	*Official*	do
Stands and Fittings, Lambton Park, Chester-le-Street	Durham County Agricultural Society	do.	May 9
Paving Streets	Willington Quay L. Bd.	do.	do.
Storage Reservoir	Baildon Local Board	B. Walker	May 11
Wimeston-road, Metal	Hebburn Local Board	Geo. H. Humble	do.
Alterations and Additions to Infirmary, Stamford	Governors	*Official*	do.
Petty Sessional Court, Cefncoedcymmer, Brecon	Standing Joint Com.	do.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Sundry Repairs and Whitewashing	Central London Sick Asylum Board	*Official*	May 11
*Pulling-down Old Building and Erecting New Dining Hall, &c.	Romford Union	F. Whitmore	do.
Church, Sutton, St. Helen's		Paley, Austin, & Paley	do
Pipe Sewers, Manholes, &c.	Hereford Town Coun.	J. Parker	do.
Sanitary Pipes (1,000 yards)	Rawmarsh (Rotherham) Local Board	J. W. Bellamy	May 12
Sewerage Works in the Town	Tredegar Local Board	W. C. Widdowson	do.
*Portable Steam Crane	Fulham Vestry	J. P. Norrington	May 13
Bridge, Fasefield, Bramshott	Petersfield High. Bd.	H. T. Keates	do.
*Printing Works and Publishing Offices, &c. "Sheffield Independent"	Proprietors	Flockton & Gibbs	do.
*New Station, &c. at Custom House and Buckhurst-hill	G. E. R. Co.	*Official*	do.
*New School Buildings at Buxton	Sexey's Trade School Governors	G. J. Skipper	May 15
Public Buildings	Bodmin Public Rooms Co. Lim.	Railing & Tonar	May 16
*New School	Swindon School Board	W. Drew	do.
Re-building Hartford Bridge, Petertavy	Devon County Council	E. H. Harbottle	May 18
Two Shelters at Recreation Ground, and Cabmen's Shelter	Guildford U.S.A.		Henry Peak	do.
*Precipitation Tanks (Main Drainage Scheme)	Manchester Corp	J. Allison	May 19
*New Workhouse Buildings	Hastings Union	P. H. Tree	May 21
New National Schools, Otley, Leeds		Fairbank & Wall, Alfred Marshall	No date do
Dwelling-house, Hanover-square, Leeds, House, Highfield-street, Beeston-hill Leeds	Geo. Hutton	C. H. Thornton	do.
School, Boundary Wall, &c. Cathays, Cardiff	Rev. C. J. Thompson	B. M. Bruce-Vaughan	do.
School, Bailey, near Thirsk	Rev. P. F. Gallwey	W. Lewis & Son	do.
Cottage, North Featherstone	Mrs. Chas. Addigtey	do.	do.
Brewery, Offices, House, &c. Newport, Mon.	Wm. Yorath & Sons	C. Johnson & Sons	do.
Additions to Archbishop Abbott's School, Guildford	Trustees	Wm. G. Lower	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Clerk of Works	East Barnet Valley Local Board	3l.	May 8
*Surveyor and Sanitary Inspector	Denton & Haughton Local Board	180l.	May 9
*Surveyor, Inspector of Nuisances, &c.	Ware Local Board	120l. &c.	May 19

Those marked with an Asterisk (*) are advertised in this Number. Competition, p. lv. Contracts, pp. lv, and vi. Public Appointments, p. xx.

MEETINGS.

SATURDAY, MAY 2.

Association of Public Sanitary Inspectors.—Dr. B. W. Richardson, President, on "National Main Drainage." 6 p.m.

Junior Engineering Society.—Visit to Tower Bridge Works. 3 30 p.m.

Royal Institution.—Professor Silvanus P. Thompson on "The Dynamo." IV. 3 p.m.

MONDAY, MAY 4.

Royal Institute of British Architects.—Annual General Meeting. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. Hugh Stannus on "The Decorative Treatment of Natural Foliage." IV. 8 p.m.

Royal Institution.—General Monthly Meeting. 5 p.m.

Victoria Institute.—Papers by Mr. Charlesworth and Mr. J. Allen Brown. 8 p.m.

Society of Engineers.—Mr. C. C. Carpenter on "Modern Coal Gas Manufacture." 7.30 p.m.

Liverpool Architectural Society.—Annual General Meeting. 7 p.m.

TUESDAY, MAY 5.

Institution of Civil Engineers.—Mr. William Langdon on "Railway-train Lighting." 8 p.m.

Art Union of London (Adelphi Theatre).—General meeting for the Distribution of Prizes. 11.30 a.m.

Society of Biblical Archæology.—8 p m

Glasgow Architectural Association.—Mr. W. J. Anderson on "The Architect and Painter, Baldassare Peruzzi, of Siena: His Work and Times." 8 p.m.

WEDNESDAY, MAY 6.

The Guild and School of Handicraft.—Professor Herkomer, R.A., on "A Technical Talk" 8 p.m.

Society of Arts.—Mr. E. L. Fleming on "The Sources and Applications of Borax." 8 p.m.

Liverpool Engineering Society.—Annual General Meeting. (1) Election of Council and Officers for ensuing Session. (2) Adjourned Discussion on Mr. George Farren's paper on "Denudations at Aber-Menai, Anglesey." 8 p.m.

THURSDAY, MAY 7.

Society for the Encouragement of the Fine Arts.—Mr. R. A. Sterndale on Cyclopean Architecture in Polynesia. 8 p.m.

Institution of Electrical Engineers.—(1) Dr. J. A. Fleming on "Some Effects of Alternating Current Flow in Conductors having Capacity and Self-Induction." (2) Mr. W. H. Preece, F.R.S., on "Some Points connected with mains for Electric Lighting." 8 p.m.

Royal Archæological Institute.—(1) Mr. E. Green, F.S.A., on "Bath as a Roman City." (2) Mr. Walter Lovell on "Queen Eleanor's Crosses." 4 p.m.

FRIDAY, MAY 8.

Institution of Civil Engineers (Students' Meeting).—Mr. J. Walter Brown on "Malta Dockyard Caisson." 7.30 p.m.

Royal Institution.—Professor W. Ramsay on "Liquids and Gases." 9 p.m.

Auctioneers' Institute.—Ordinary General Meeting. 3 p.m.

SATURDAY, MAY 9.

Edinburgh Architectural Association.—Visit to Newhall House, Penicuik House, Ravensneuk Castle and Brunstane Castle.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 20.—By *Wells & Read:* F.g.r. of 12l. 12s., with reversion in 95 yrs., Harrow, 300l.

APRIL 21.—By *Bean, Burnett, & Co.:* 31, Tite-st, Chelsea, f., 2,850l.; 6 and 8, Ponsonby-pl., Vauxhall, u.t. 33 yrs., g.r. 12l., r. 92l., 785l.; 10, Roehampton-st., u.t. 37 yrs., g.r. 8l., r. 50l., 145l.; 46, Lillington-st., u.t. 34 yrs., g.r. 5l. 13s. 6d., r. 40l., 420l.—By *Towers, Ellis, & Co.:* Nos. 123 and 125, Finchley-rd., u.t. 70 yrs., g.r. 50l., r. 153l., 1,220l.—By *Newbon & Co.:* 14, 16, and 20, Copenhagen-st., Islington, f. r. 120l., 1,210l.; "Fairview" and "Fairlawn," Bounds Green-rd., u.t. 89 yrs., g.r. 14l. 14s., r. 52l., 450l.; 1 to 9, Lyme grove, Hackney, u.t. 54 yrs., g.r. 24l., r. 119l. 12s., 480l.; 12, Douglas-rd., Canonbury, u.t. 55 yrs., no g.r., 700l.; 29, Osnaburgh-st., Euston-rd., u.t. 31 yrs., g.r. 18l., r. 50l., 220l.; 211, 215, and 217, Blackstock-rd., Highbury, f., r. 71l., 1,065l.—By *Perkins & Cæsar:* 18, Matilda-st., Barnsbury, u.t. 50 yrs., g.r. 2l., 210l.; 22, 23, 70, and 71, Princes-rd., Bermondsey, u.t. 32 yrs., g.r. 13l. 10s., r. 93l. 16s., 705l.; 22 to 32 (even), Parke's-buildings, u.t. 28 yrs., g.r. 12l., r. 123l. 10s., 565l.; "The Princess Alexandra" beer-house, Neptune-st., Rotherhithe, u.t. 19 yrs., g.r. 7l. 10s., r. 32l., 205l.; 285 and 287, Tooley-st., Southwark, f., r. 60l., 1,195l.; 4 to 10, Stevens-st., Bermondsey, f., r. 165l. 2s., 1,075l.; 9, 10, and 11, Princes-st., f., r. 73l., 915l.

APRIL 22.—By *C. C. Taylor & Son:* Hailey Cottages, Great Amwell, Herts, f., r. 35l. 10s., 360l.; 60, Pearson-st., and 47, Appleby-st., Kingsland, u.t. 11 yrs., g.r. 6l. 14s., r. 63l., 140l.; 57, Pearson-st., u.t. 13 yrs., g.r. 12l., r. 80l., 520l.; 56 to 74 (even), Fellows-st., u.t. 23 yrs., g.r. 35l., r. 306l., 1,850l.; f.g.r. of 8l. 10s., Strode-rd., Fulham, with reversion in 88 yrs., 100l.; f.g.r. of 62l. 10s., with reversion in 83 yrs., Munster-rd., 1,160l.—By *D. Young:* "Canfield Villa," Brodrick-rd., Wandsworth Common, f., r. 40l., 580l.; "Kenton Villa," f., r. 40l., 550l.; 28 and 40, Garfield-rd., u.t. 82 yrs., g.r. 14l. 10s., r. 75l., 820l.; 13, Freke-rd., u.t. 80 yrs., g.r. 5l., r. 26l., 250l.; "Holly Lodge," Holland-rd., Clapham, u.t. 8 yrs., g.r. 7l. 7s., 100l.; 5, Holland-st., Brixton, u.t. 8 yrs., g.r. 4l. 13s. 4d., r. 32l., 60l.; 39, Holland-st., u.t. 7 yrs., g.r. 10l. 10s., r. 24l., 40l.—By *A. Cole & Co.:* 7, Town End Villas, Edmonton, f., r. 19l. 395l.; 3, St. James's-rd., u.t. 973 yrs., g.r. 1s., r. 19l., 200l.: copyhold house, Sun-st., Waltham Abbey, r. 14l., 165l.

APRIL 23.—By *J. Bussey:* 114, Grundy-st., Poplar, f., 500l.—By *C. C. & T. Moore:* 10 to 20 (even), Grafton-rd. South, Plaistow, f., r. 137l. 16s., 1,270l.; 22 to 34 (even), Grafton-rd. South, f., r., 152l. 2s., 1,380l.; 31, 32, & 33, Cordova-rd., Bethnal Green, u.t. 58yrs., g.r. 10l. 17s. 6d., r. 81l. 18s., 535l.; 16, 18, & 20, Hewlett-rd., Old Ford, u.t. 75 yrs., g.r. 12l., r. 109l. 4s., 825l.; 46, Wellington-rd., Bow-rd., u.t. 73 yrs., g.r. 3l., r. 38l., 350l.; 4, 6, 8, 12 to 20 (even), Caldervale-rd. u.t. 89 yrs., g.r. 56l., 2,800l.; 29 to 35 (odd), Hartland-rd., West Ham, u.t. 88 yrs., g.r. 5l., 430l.; 1, Billinggate-st., 10 to 16 (even), York-st., and 1 to 8, Sexton's-pl., Greenwich, f., r. 185l. 18s., 610l.—By *E. Evans:* 13 and 15, Pembridge-villas, Wandsworth, u.t. 77 yrs., g.r. 16l. 16s., 255l.—By *Farebrother, Ellis, & Co.:* 8, Berkeley-pl., Wimbledon, u.t. 87 yrs., g.r. 8l., r. 65l., 750l.

APRIL 24.—By *F. J. Bisley:* 21 and 23, Adams-gardens, Rotherhithe, f., r. 26l., 160l.; 20, Alexandra-rd., Hornsey, u.t. 86 yrs., g.r. 7l. 10s., r. 34l., 300l.—By *Fuller, Horsey, Sons, & Cassell:* 28, St. Lawrence-rd., Brixton, u.t. 72 yrs., g.r. 6l. 6s., r. 30l., 250l.; 69, Church-rd., Battersea, u.t. 70 yrs., g.r. 3l. 12s., r. 20l. 18s., 235l.; 4, Ashurst-st., u.t. 73 yrs., g.r. 5l., r. 32l. 14s., 205l.; 6 and 8, Ashurst-st., u.t. 73 yrs., g.r. 20l., r. 64l. 10s., 360l.

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	6/0/0	7/15/0
Teak, E.I.... load	8 10 0	14 0 0
Sequoia, U.S.ft.cu.	2/3	3/0
Ash, Canada load	2/10/0	4/0/0
Birch, do.	2/5/0	4/5/0
Elm, do.	3/10/0	4/15/0
Fir, Dantzic, &c.	2/0/0	3/15/0
Oak, do.	2/10/0	4/10/0
Canada.....	4/17/6	6/10/0
Pine, Canada red	2/10/0	3/10/0
Do, yellow	2/0/0	5/10/0
Lath, Dantzic, fath	5/0/0	8/0/0
St. Petersburg	5/0/0	7/0/0
Deals, Finland, 2nd & 1st std 100	7/0/0	10/0/0
Do, 4th & 3rd ..	7/0/0	8/0/0
Do, Riga	6/0/0	7/10/0
St. Petersburg, 1st yellow ..	9/0/0	14/0/0
Do, 2nd yellow	8/0/0	9/0/0
Do, white	6/10/0	10/0/0
Swedish	6/10/0	15/0/0
White Sea	8/0/0	16/10/0
Canada, Pine 1st	13/0/0	24/0/0
Do, do, 2nd....	9/0/0	15/10/0
Do, do, 3rd, &c.	6/10/0	10/0/0
Do, Spruce, 1st	8/10/0	10/10/0
Do, do, 3rd & 2nd.....	6/0/0	7/10/0
New Brunswick	5/0/0	7/0/0
Battens, all kinds	3/10/0	15/10/0
Flooring Boards, 9g., 1 in. prep. 1st	0/0 0	0/14 0
Do, 2nd.....	0 9 0	0 10 6
Other qualities	0 6 0	0 7 6
Cedar, Cuba ..ft.	¼	¼
Honduras, &c.	¼	¼
Mahogany, Cuba.	⅛	⅙
St. Domingo, cargo av	⅛	⅙
Mexican do. do	⅛	⅙
Tobasco do. do	⅛	⅙
Honduras do..	⅛	⅙
Box, Turkey ton	4/0/0	18/0/0
Rose, Rio.....	10/0/0	20/0/0
Bahia	9/0/0	18/0/0

TIMBER (*continued*).		
Satin, St. Domingo .....ft.	0/0/10	0/1/3
Porto Rico	0 0 10	0 1 6
Walnut, Italian .	0 0 3½	0 0 7
METALS.		
IRON—Bar, Welsh, in London...ton	6 5 0	6 15 0
Do. do. at works in Wales	5 15 0	6 5 0
Do. Staffordshire, in London	6 5 0	7 0 0
COPPER—British, cake and ingot	56 0 0	57 0 0
Best selected ..	5 0 0	0 0 0
Sheets, strong..	68 0 0	0 0 0
Chili, bars	52 10 0	0 0 0
YELLOW METAL	0 0 6	0 0 6½
LEAD—Pig, Spanish....ton	12 10 0	0 0 0
English, com. brands	12/12/6	0/0/0
Sheet, English, 3 lbs. per sq. ft. and upwards ..	14/5/0	0/0/0
Pipe	14/15/0	0/0/0
ZINC—English sheet .....ton	28 5/0	0/0/0
Vieille Montagne.....	26/15/0	0/0/0
TIN—Straits	90/10/0	0/0/0
Australian	90/15/0	0/0/0
English Ingots	94/10/0	0/0/0
OILS		
Linseed .....ton	22 7 6	22 15 0
Cocoanut, Cochin	33 10 0	0 0 0
Do Ceylon....	29 10 0	0 0 0
Palm, Lagos	23 10 0	0 0 0
Rapeseed, English pale	30 0 0	31 10 0
Do, brown	30 0 0	0 0 0
Cottonseed ind.	22 10 0	0 0 0
Olein	21 15 0	24 0 0
Lubricating, U.S.	4 0 0	7 5 0
Do. refined	7 10 0	12 0 0
TAR—Stockholm barrel	1/1 6	1/2 0
Archangel	0 13 6	0 0 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BEDFORD.—For erecting a house in Rothesay-road, for Mr. Samuel Green. Mr. F. T. Mercer, architect, Bedford:—

Webster & Cannon.....	£1,640
French & Ellwood	1,483
J. P. White	1,447
Melcombe Bros.	1,350
Gen Harrison.....	£1,347 0
C. E. Fathers	1,290 10
T H Coleman	1,288 0

BOSTON (Lincolnshire).—Accepted for the erection of a villa residence. Mr. James Rowell, architect, Boston:—

Bricklayer's, Mason's, Carpenter's, Joiner's, and Plasterer's Work.

Johnson Taylor, Boston £425 0 0

Painter's, Plumber's, Glazier's, Gas fitter's, and Bricklayer's Work.

E. J. Kime, Boston (accepted) £88 0 0

BOURNEMOUTH.—For work in connexion with the Boscombe Arcade, Bournemouth, for Messrs. Phillips & Beckett. Messrs. Dawson & Donkin, architects and surveyors, Bournemouth. Quantities supplied :—

Wrought ironwork and columns.

Yates, Haywood, & Co., Limited	£560	0 0
Atlas Engine Company	550	10 0
Edward Howell	491	12 8
G. F. Darby & Co.	385	1 0
Brownlie & Murray, Glasgow*	376	8 0

* Accepted, less cast-iron columns.

For forty cast-iron columns only.

Steven Bros. & Co.	£122	10 0
W. Macfarlane & Co., Glasgow (accepted)	92	0 0

Bath and Portland stone work.

J. Alsford, Boscombe, Bournemouth (accepted).. £2,050 0 0

Scagliola columns, panels, &c., to internal bays.

Bellman & Ivey, London (accepted) £338 16 0

BRIXHAM (Devon).—For the erection of a villa residence for Mr. F. Lakeman, jun. Mr. George London Bridgman, architect, Paignton :

W. A. Goss	£1,655	0
M. Brimblecombe	1,587	10
Hazlewood Bros.	1,538	0
H. Webber	1,490	0
E. P. Bovey	£1,475	
Rabbich & Brown	1,470	
R. Yeo, Torquay*	1,375	

* Accepted

BROCKENHURST (Hants).—For alterations, &c., at the Morant Arms Hotel. Messrs. W. H. Mitchell, Son, & Gutteridge, architects :—

T. Rashley	£165	0 0
H. Stevens & Co., Southampton (accepted)	153	0 0

BURSLEM.—For alterations and repairs to the "Bleak Hill" earthenware manufactory, for the Executors of the late Edward Moore. Mr. Edwin Penn, architect, Stoke-upon-Trent :—

William Grant, Burslem (accepted)	£535	0 0

CARSHALTON.—For the erection of billiard-room, stables, &c., at Blythwood, Carshalton, for Mr. T. Cooks. Messrs. Newman & Jacques, architects :—

Kelland	£1,488	0
Hollingsworth	1,233	0
S. E. Nightingale	1,176	0
Howe & White	£1,168	17
Humphries	1,119	0
Balchen & Shopland	922	0

COMPTON (near Stockbridge).—For the erection of entrance-lodge and gates, gardener's cottage, and pair of labourers cottages, for Mr. John Spiller. Messrs. W. H. Mitchell, Son, & Gutteridge, architects. Southampton :—

G. Wheeler, jun.	£1,561	0
H. Stevens & Co.	1,525	0
T. J. Jukes	£1,497	
F. Beale, Andover*	1,490	

* Accepted

DEVONPORT. — For alterations to the turncock's residence, Dowden's Reservoir, for the Devonport Water Company. Mr. H. Francis, Engineer, Waterwork's Office, Devonport :—

J. Harvey	£139	0 0
S. H. Smith, jun.	132	15 0
S. Perkins	128	14 6
W. J. Allin, Stone-house*	£107	10 0

* Accepted

EALING.—For rebuilding first portion of the "Feathers" Hotel, for Messrs. Stephens Bros. Messrs. G. H. Fargeter & Co., architects, 31, Red-street Buildings, E.C. Quantities supplied :—

Thomas Nye, Ealing (accepted)	£4,372	0 0

EAST BARNET.—For alterations and additions to the "Prince of Wales," East Barnet. Mr. Fred. A. Ashton, architect, Stratford, E. :—

W. Shurmur	£891	
H. & H. Cocks	780	
C. Watts	780	
North Bros.	733	
Henrle & Farrow	£733	
Coulsell Bros.	668	
J. Linzell	661	
F. Voller (accepted)	643	

EDMONTON.—For the construction of roads and sewers on the first portion of the Town-road Estate, Edmonton, for the London and Suburban Land and Building Co. Messrs. Hammack & Lambert, Norgrove-buildings, 59, Bishopsgate-street :—

Wood	£22,2[illegible]	8 10
Bloomfield	1,716	0 0
Nicholls	£1,489	0 0

HARLESDEN. For completing for occupation four houses in Highfield-road, Fortune-gate, for the Globe Land and House Property Trust, Limited. Mr. Thomas Spink, surveyor, 25, Grainger-street, S.W. :—

H. B. Oliley	£840	0 0
H. Endy	758	16 0
Scott & Phillips	650	0 0
Tappin	615	0 0
E. Parker	588	0 0
H. Collins	£570	0 0
Wheeler & Co.	498	15 0
Robert Watt Hayes	485	0 0
[illegible]	483	0 0

* Amount tender accepted

KENT -Accepted for repairs to main roads for 1891-92, for the Bridges and Roads Committee of the Kent County Council. Mr. F. W. Huck, County Surveyor :—

Section 1.—Dartford.

The Kent Road Co., Gravesend	£1,938 10 0

Section 2. Dartford.

The Kent Road Co., Gravesend	£2,077 0 0

Section 3 Rochester.

Tuff & Miskin, Rochester	£2,870 18 10

Section 4.—Rochester.

The Kent Road Co., Gravesend	£479 0 0

Section 5.—Hoo.

Tuff and Miskin, Rochester	£1,546 10 5

Section 6.—Bromley.

The Kent Road Co., Gravesend	£2,547 5 0

Section 7.—Bromley.

Pettit & Sons, Bromley	£1,149 15 0

Section 8.—Sevenoaks.

The Kent Road Co., Gravesend	£1,373 0 0

Section 9 —Sevenoaks.

E. B. Chittenden, Offham	£1,521 5 0

Section 10. - Wrotham.

E. B. Chittenden, Offham	£1,197 12 6

Section 11. Malling.

The Kent Road Co., Gravesend	£348 10 0

Section 12.—Malling.

E. B. Chittenden, Offham	£1,924 16 3

Section 13.—Malling.

E. B. Chittenden, Offham	£1,510 15 0

Section 14.—Malling.

The Kent Road Co., Gravesend	£696 19 6

Section 15.—Tonbridge.

F. Playfoot, Edenbridge	£845 0 0

Section 16.—Tonbridge.

The Kent Road Co., Gravesend	£2,795 11 3

Section 17.—Tonbridge.

W. & G. Arnold, Frant	£1,686 6 8

Section 18.—Tonbridge.

Arnold & Lambert, Frant	£2,600 1 0

Section 19.—Maidstone.

The Kent Road Co., Gravesend	£1,065 10 0

Section 20.—Maidstone.

W. Lambert, Horsmonden	£809 12 9

KENT (continued) :

Section 21.—Maidstone.

J. Ellis & Co., Maidstone	£1,344 10 0

Section 22 —Maidstone.

The Kent Road Co., Gravesend	£1,748 0 0

Section 23. Cranbrook.

W. Lambert, Horsmonden	£1,578 16 3

Section 24.—Cranbrook.

The Kent Road Co., Gravesend	£1,850 13 4

Section 25.—Cranbrook.

The Kent Road Co., Gravesend	£1,486 18 0

Section 26 Hollingbourne

R. L. Knight, Sittingbourne	£1,991 10 0

Section 27 —Hollingbourne.

N. Marley, Detling	£1,922 8 11

Section 28.—Hollingbourne.

The Kent Road Co., Gravesend	£2,028 7 6

Section 29.—Hollingbourne.

N. Marley, Detling	£777 4 4

Section 30.—East Ashford

R. L. Knight, Sittingbourne	£1,245 11 4

Section 31.—East Ashford

R. L. Knight, Sittingbourne	£791 11 9

Section 32.—East Ashford

R. L. Knight, Sittingbourne	£830 0 5

Section 33 —Ryarsh.

R. L. Knight, Sittingbourne	£683 10 0

Section 34.—Ryarsh.

T. Ashenden, Canterbury	£813 10 8

Total amount of lowest tenders £47,113 13 8
County surveyor's estimate £46,[illegible] 7 11

LEYTONSTONE.—For erecting three houses in Grosvenor-lane, Leytonstone, E., for Mr. H. S. Smith. Mr. Fred. A. Ashton, architect, Stratford, E. :—

J. Mansell	£940	G. Helbing	£899
Hearle & Farrow	891	H. Whitty	670
D. Sayer	875	J. & F. Bane (accepted)	852

LLANFIHANGEL-RHYDITHON (co. Radnor).—For the restoration of the parish church. Mr. Stephen W. Williams, architect, Rhayader, Radnorshire. Quantities by the architect.—

A. Meredith	£385	0	Price & Deakins	£[illegible]
J. D. Williams	363	0	Henry Price, Builth*	349
E. Davies & Son	339	10		

* Accepted.

LONDON.—For alterations, &c., to the "Alexandra Palace" Hotel, Wood Green, N. Mr. Waterfield, architect. Quantities supplied.—

	Walnut.	Pitch Pine.	Yellow Deal.
Holloway Bros.	£1,461 0 0	£1,254 1	£1,289
Mower & Son	1,447 0 0	1,247	1,191
Johnson	1,442 0 0	1,238	1,200
Veers	1,389 9 6	1,204	1,154
Yardley & Sons	1,338 0 0	1,115	1,069
J. C. Richardson	1,328 0 0	1,030	989
Voller	1,307 0 0	1,021	954

LONDON.—For sanitary works to No. 1, Upper Hamilton terrace, N.W. Mr. Thomas Durrans, architect, 44, Upper Baker-street, N.W. :—

[illegible] H. Durrans & Sons	£226 10	H. C. Clifton	£[illegible] 0
G. Head & Co.	225 0	J. Myrans & C[illegible]	215 0

* Accepted.

LONDON. For alterations and additions to the "Carlton" public-house, Kentish Town, N.W., for Mr. G. Burton. Mr. E. E. Nisbett, architect, 11, Union Chambers, Worship-street, E.C.

Gould & Brand	£1,181	Burman & Son	£[illegible]
Conway	[illegible]	Ranson*	998
Todd	1,[illegible]		

* Accepted.

LONDON.—For alterations and additions to the "Grosvenor" Hotel, Carnaby-street, for Mr. Reece. Mr. E. E. Nisbett, architect, 11, Union Chambers, Worship-street.

Water Bros.	£[illegible]	Burman & Son	£[illegible]
Ewin	[illegible]	Todd (ac. pted)	994

LONDON. For erecting Post Automatic Machine Buildings, Lillie-road, Fulham. Mr. E. W. & J. P. Cutts, architects, 28, Southampton-street, Strand, W.C.

Chamberlain Bros.	£2,491	J. Fillery & Son	£2,239
J. Howard Lucas	[illegible]	J. Tyerman	2,200
A. Porter	[illegible]	S. E. Nightingale (accepted)	2,187

LONDON - For pavior's work, &c., in Church-street, Fulham, for the London Cattle Company, Limited. Mr. A. R. Binnie, Engineer, 3, John Mowlem & Co., £4,930 0 0 | Nowell & Robson .. £4,[illegible] 0 0
William Stubbs .. [illegible] 7 8

LONDON. For painting, &c., at the workhouse, Marlees-road, for the Guardians of St. Mary Abbotts, Kensington. Mr. Thos. W. Aldwinckle, architect, 2, East End-avenue, Leadenhall-street, E.C. Quantities supplied :—

Flack & Co.	£6,967	J. G. B. Marshall	£6,100
Kirk & Randall	6,922	J. Pratt & Co.	5,880
Leslie & Co.	6,473	W. Lucas & Co.	5,[illegible]
J. Holland	6,[illegible]	H. Tomkins (as accepted)	5,[illegible]

LONDON.—For heating the lunatic wards of Poplar Union Workhouse and other work. Messrs. Clarkson, surveyors, 148, High-street, Poplar :—

Young & Marten	£215 0 0	McCormick & Sons	£150 0
Laud	198 0 0	Graveley	140 12
Fraser & Fraser	196 0 0	Hallett	139 0
Cement, Jenkes & Co.	172 12 6	J. & F. May	137 0
Thorne & Son	170 5 0	Crane	130 0
Dawson & Co., Limited	164 0 0	Jeffreys	129 0
Blundells, Ltd.	159 8 6	J. Fraser & Son	122 0

LONDON.—For alterations on and additions to St. Michael's Mission Hall, Rackham-street, W. Mr. Alan Carmichael, architect :—

Messrs. L. W. & S. Ransom, Kensal road (accepted) £457 0 0
[No competition.]

LONDON. For building down and rebuilding No. 7, Fenchurch-street, E.C., for Mr. C. J. Knowles. Mr. E. B. Ellis, architect :—

Woodward & Co.	£12,500	Rolls	£12,022
Hall, Beddall & Co.	12,448	B. E. Nightingale	11,883
Perry & Co.	12,271	Ashby & Horner	11,500
Brass	12,227		

LONDON.—For fittings at the London & Westminster Bank, High-street, Kensington. Mr. F. W. Hunt, architect :—

Phillips & Bunker	£1,580	Dunn & Cadman	£1,470
B. E. Nightingale	1,490		

LONDON. -For an additional story at North-row, Oxford-street, W., for Messrs. Peal & Co. Mr. T. Chatfeild Clarke & Sons, architects :—

Bywaters	£1,029	Cox	£[illegible]
S. E. Nightingale	968	Ashby Bros.	887
Lawrence	939	Hall, Beddall, & Co.	844

LONDON -For the erection of a school to provide accommodation for 800 children on the site in High-street, Peamstead, and also for the erection of a sch olkeeper's ho use, with a room underneath suitable for technical purposes, for the School Board for London. Mr. T. J. Bailey, Architect :—

Holloway Bros.	£22,317	Killby & Gayford	£19,618
B. E. Nightingale	21,969	J. T. Chappell	19,488
W. H. Lorden & Son	20,282	W. Downs	19,312
J. W. Hobbs & Co., Limited	17,597	Hart Bros.	19,098
J. Tyerman	19,959	Treasure & Son	18,888
		Kirk & Randall*	18,123

* Recommended by the Works Committee for acceptance.

LONDON.—For providing new offices for the British-street School, Millwall, and for relaying the drain, &c., for the School Board for London. Mr. T. J. Bailey, Architect :—

W. Gregar & Son	£1,434	J. Shillitoe & Son	£1,195
Killby & Gayford	1,400	Davis Bros.*	1,150

* Accepted by the Works Committee.

LONDON.—For executing sanitary and drainage work at the Brentwood Industrial School, for the School Board for London. Mr. T. J. Bailey, Architect :—

Thomas Bros.	£[illegible]	J. F. Rees	£447
Chesterton & Batts	[illegible]	F. J. Ashead	437
E. Lawrance & Sons	688	W. Grover & Son*	387

* Accepted by the Works Committee.

LONDON.—For the erection of a school to provide accommodation for 800 children on the site in Chotmer-road, Peckham, and for the erection of a school-keeper's house, with a room underneath suitable for technical purposes, for the School Board for London. Mr. T. J. Bailey, Architect :—

	Addition to Standard Works Tenders, &c.	Addition to Alternative Tenders, &c.
J. Mowlem & Co.	£18,892	£1,[illegible]
J. Tyerman	18,[illegible]	1,[illegible]
J. Rider	18,[illegible]	1,[illegible]
W. H. Lorden & Son	18,[illegible]	1,[illegible]
S. & W. Patterson	18,[illegible]	1,[illegible]
W. Downs	18,[illegible]	1,[illegible]
H. Lovatt	17,610	1,[illegible]
Lathey Bros.	17,[illegible]	1,[illegible]
J. W. Hobbs & Co., Limited	16,[illegible]	1,[illegible]
J. T. Chappell	15,[illegible]	1,[illegible]
Holloway Bros.	15,[illegible]	1,[illegible]

* Recommended by the Works Committee for acceptance.

LONDON.—For various repairs and alterations, &c., at the Moreland-street Board-schools, Goswell-road, for the School Board for London. Mr. T. J. Bailey, Architect :—

Wm. Neil	£1,251	J. T. Perry (taken by the F. McCormick & Son	1,048
		Wallis & Linnitte	£927

LONDON.—For providing and fixing heating apparatus, on the low-pressure hot-water system, for the enlargement of each of the four underneath the schools which is now in course of erection, and also for extending the apparatus to the class-rooms in the old portions of the schools, for the School Board for London. Mr. T. J. Bailey, Architect :—

Manor-street School, Tollington Park.

John Grundy	£[illegible]	W. G. Cannon	£[illegible]
Purcell & Nobbs	568 10 0	Comyn, Ching, & Co.*	499 0
J. & E. May	[illegible] 0 0		

* Recommended by the Works Committee for acceptance.

Dame-street School, Upper Holloway.

John Grundy	£870	J. & F. May	£[illegible]
Purcell & Nobbs	760	J. Wontner-Smith, Gray, & Pott	[illegible]
W. G. Cannon	[illegible]	Comyn, Ching, & Co.	[illegible]
John Fraser & Son	696	J. Simmons & Son, & Co.*	[illegible]

* Recommended by the Works Committee for acceptance

Rotherhithe New Road.

John Grundy	£630 0 0	J. & F. May*	£[illegible] 0 0
J. Fraser & Son	682 0 0	W. G. Cannon	[illegible] 0 0
T. Scott & Son		J. G. Wagstaff	[illegible] 10 0
Limited	[illegible] 0 0		

* Excludes cost of stores

: Recommended by the Works Committee for acceptance.

Pocock-street, Blackfriars road.

John Grundy	£690 0	W. G. Cannon	£485 0
J. Fraser & Son	572 0	Comyn, Ching & Co.	[illegible] 10
Purcell & Nobbs	[illegible]	J. Wontner-Smith, Gray, & Pott & Co.*	[illegible] 13

* Recommended by the Works Committee for acceptance.

LONDON. For the erection of out-patients' department, Children's Hospital, Ormond-well. Messrs. Hammack & Lambert, architects, Norgrove-buildings, 59, Bishopsgate-street :—

Mitchell	£[illegible]	Boyce	£7,120
Cox	7,[illegible]	Ashby & Horner	7,080
Hearle & Farrow	7,[illegible]	F. & F. J. Wood	6,804
Hall, Beddall & Co.	7,[illegible]		

LONDON.—For the erection and completion of public baths and wash-houses, Camberwell-green, for the Commissioners. Messrs. Spalding & Cross, architects :—

Rattwatt	£[illegible]	Brass	£[illegible]
Coxen	[illegible]	Higgs	[illegible]
Shepherd	[illegible]	Lathey Bros.	[illegible]
Kirk & Randall	[illegible]	Conder	[illegible]
Chilton	[illegible]	Jarrard	[illegible]
B. E. Nightingale	[illegible]	Balcombe	[illegible]
Hodgson	[illegible]	Turner	[illegible]

LONDON.—For the erection of Central Library, Camberwell, for the Commissioners. Mr. R. Wheltock, architect

Evans	£[illegible]	Brass	£[illegible]
Marsland	[illegible]	Shepherd	[illegible]
Patman & Fotheringham	[illegible]	Lucas	[illegible]
Chilton	[illegible]	Higgs	[illegible]
Dove Bros.	[illegible]	Holloway	[illegible]
T. Rider & Son	[illegible]	Holloway Bros.	[illegible]
Lawrance & Son	[illegible]	Richardson	[illegible]
Sawyer	[illegible]	Avard	[illegible]
B. E. Nightingale	[illegible]	Balcombe	[illegible]
Perry & Co.	[illegible]	Allen & Sons	[illegible]

LONDON.—For the erection of premises, 1, Aldgate High-street Messrs. H. H. Bridgman & Goss, architects :—

Hazlewood	£4,976	Perry & Co.	£4,697
Morter	4,804	Lawrance & Son	[illegible]
B. E. Nightingale	4,296	Dixon	4,[illegible]
Kirk & Randall	4,198	Toms	[illegible]
Neave & Sons	4,097	Lumbis	[illegible]
Jocelyn, Young, & Co.	[illegible]	H. J. Williams	[illegible]

LONDON —For the erection and completion of the Hampstead Synagogue and Schools, West End-lane, West Hampstead, N.W. Mr. Delissa Joseph, architect

S. Barnett	£17,250	Brass	£15,865
Grover & Son	16,[illegible]	Chappell	15,776
Morter	16,[illegible]	Perry & Co.	15,665
Holloway	16,[illegible]	Ashby	[illegible]
Saboy Bros.	16,[illegible]	Killby & Gayford	15,420
E. Lawrance & Son	15,[illegible]	B. E. Nightingale	15,278
Patrick & Son	16,113	Kearley	15,[illegible]
Woodward	16,065	Allen & Son	14,537
Adamson	15,874		

LONDON.—For works required in diverting stone stairs, boundary walls, &c., at the Free Trade Wharf, Ratcliffe. Mr. Chas. Dunch, architect :—

Gentry	£3,340	J. Mowlem	£3,190
Harris & Wardrop	3,230	Munday & Son	1,967
B. E. Nightingale	3,18[illegible]		

LONDON. For pulling down old premises and erecting a roof over yard in rear of new factory, Valentine-place, Blackfriars-road S.E. Mr. W. B. Woodroffe, architect :—

Bywaters Bros.	£1,030	J. Hoare & Sons	£1,072
Hall, Beddall, & Co.	1,184	Holloway Bros.	1,060
Parker	1,140	B. E. Nightingale	1,025
Downs	1,123	Young & Lousdale	1,010
Outlwaite & Sons	1,069		

LONDON.—For erecting warehouse and workshops on the Old street Estate, E.C., for Woolley's Trustees. Mr. H. Parsons, architect:—

	If concrete floors.	If wood floors.
W. Smith	£6,910 0 0	£6,655 0 0
Candler & Son	6,820 0 0	6,544 0 0
King & Son	6,620 0 0	6,446 0 0
Crappell	6,775 0 0	6,442 0 0
T. Ruler & Son	6,598 0 0	6,278 0 0
Lawrence & Son	6,486 0 0	6,221 0 0
Perry & Co.	6,481 0 0	6,189 0 0
E. E. Nightingale	6,414 0 0	6,175 0 0
Downs	6,381 0 0	6,150 0 0
F. & H. Higgs	6,217 0 0	5,986 0 0
Co-operative Build.rs	6,085 0 0	5,832 0 0

LONDON.—For erecting printing premises, Breams-buildings, Chancery-lane, E.C., for Messrs. Francis & Co. Mr. W. C. Street, architect:—

S. & W. Patti.son & .	£4,241	Holloway Bros.	£3,950
W. Downs	4,100	Dove Bros.	3,875
Higgs & Hill	4,034	E. E. Nightingale	3,856
Colls & Sons	4,4[illegible]		

LONDON.—For the erection and completion of new church and presbytery, Reder's-street, Southwark for the Right Rev. Dr. Butt. Mr. F. A. Walters, F.S.A., architect:—

Goddard & Sons	£7,450	Gregory	£6,877
Bottrill	7,380	Lapley	6,648
Stimpson & Co.	6,950	Smith & Sons	6,680
E. E. Nightingale	6,880		

LONDON.—For re-instating after fire to premises, 119, Queen-Victoria-street, E.C., for Mr. A. Davidson. Mr. W. Wimble, architect:—

Faulkner	£4631	Lawrence & Son	£4,418
Sarvener	4,576	E. E. Nightingale	4,278
Hall, Beadel, & Co.	4,540	Arthur & Horner	4,227
Kilby & Gayford	4,478	J. M. Iver	5,195

NEWPORT (Mon.).—For rebuilding the Congregational Chapel, Risca, Mon. Mr. Alfred Swash, architect, 3, Friar's-chambers, Newport, Mon. Quantities by architect:—

D. Parfitt	£1,475	Jno. Jones	£1,279
W. Price	1,448	Thos. Williams	1,150
T. G. Damond	1,291	Edwyn Richards, Price-st.,	
Hughes & Pugh	1,150	Newport accepted	1,100

PAIGNTON (Devon).—Accepted for rebuilding the landing-stage at the Pavilion Pier, for the Company:

R. Harris, Paignton £320 10 0

PAIGNTON (Devon). For the erection of a Masonic Hall. Mr. George Sonlon Bridgman, architect, Paignton:—

Drew Bros.	£735 0	Rabbich & Brown, Paign-	
R. Harris	688 10	ton (accepted)	£663 0
C. Perrett	693 0		

RUNCORN. For the erection of new chancel, St. Michael's Church, Runcorn. Mr. T. D. Barry, architect, Liverpool:—

Miller	£1,470	Raffle & Campbell	£1,217
Chappell Brothers	1,339	Macdermott	1,157
Laurie & Brumley	1,295	Nicholson & Clarke*	1,129
Bleakley	1,225	* Accepted.	

RIDGUP.—For building a detached dwelling-house at Sidcup, Kent, for Mr. W. R. Masarson, J.P. Mr. J. Kingwell Cole, architect. Quantities by Mr. Edward S. Mansergh, 28, Mount street, Grosvenor-square, W.:—

A. E. Faulkner	£2,160	B. E. Nightingale	£1,627
F. G. Coxall	1,780	S. Chafen	1,620
G. Neal	1,685		

SNODLAND (Kent). For the erection and completion of a church at Snodland, Kent. Mr. H. P. Mouchton, architect.

E. E. Nightingale	£2,721	Naylor	£2,309
Prior	2,705	Boone	2,279
Ayard	2,610	Wallace	2,260
Hedge & Son	2,556	Langridge	2,234
Pye	2,470	Bishop	2,150
Clements	2,321		

SOUTHAMPTON. For the erection of private residence, Winchester-road, Banister Park Estate, for Mr. B. Russell. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton:—

W. Franklin	£1,646	A. D. Farrell	£1,275
H. J. Sanders	1,553	S. Witt, Southampton*	1,115
T. J. Jukes	1,296	* Accepted.	

STOKE-UPON-TRENT.—For the erection of a detached house and out-offices at the top of Regent-street, Stoke, for Mr. H. G. Kirkham (all trade materials, fittings, grates, chimney-pieces, &c., being provided). Mr. E. Penn, architect, Stoke-upon-Trent:—

Ball & Robinson	£795 10	Bradbury	£690 0
H. & R. Ibukip	778 0	G. W. Bancock, Stoke*	550 0
T. R. Yoxall	664 0	* Accepted.	

STOKE-UPON-TRENT.—For alterations and additions to the "Eagle" Music Hall. Mr. Edwin Penn, architect, Stoke-upon-Trent:—

Ball & Robinson, Stoke (accepted) £504 0 0

STRATFORD.—For alterations and additions to the "Lord Henniker" public house, The Grove, Stratford, E., for Mr. Geo. Cox. Mr. Fred. A. Aston, architect, Stratford, E.:—

North Bros.	£2,428	H. Whitty	£1,840
Hearle & Farrow	2,154	J. & H. Cocks	1,844
W. Shurmur	2,097	Coulsell Bros.	1,822

SWANSEA.—For erecting nine houses and shops in Dyvatty-street, for Mr. Joseph Hall. Mr. H. C. Portsmouth, architect, Swansea. Quantities by the architect:—

Jenkins Brothers	£3,750 0	Thomas, Watkins &	
Richards	3,441 0	Jenkins	£3,200
Bennett Brothers	2,897 0	Billings	2,900
J. & F. Weaver	3,393 9	J. D. Williams	2,850

SWANSEA.—For alterations and additions to the Ivorites Hotel, High-street. Mr. H. C. Portsmouth, architect, Swansea. Quantities by the architect:—

Bennett Brothers (accepted) £840 0 0

TODMORDEN.—Accepted for alterations and additions to Roomfield-head, for the School Board. Mr. Jesse Horsfall, architect, Bridge-street, Todmorden:—

Mason and Bricklayer, Benj. Lumb, Todmorden.
Carpenter and Joiner, Joseph Sutcliffe, Todmorden.
Slating, Plastering, and Painting, Wrigley, Hebdenbridge.
Plumbing, &c., F. Davis, Todmorden.
Heating, Jno. Petrie, Rochdale.

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The Royal Academy Exhibition.

THE Exhibition of 1891 is not one of the most brilliant, but it will be found to contain a considerable number of fine pictures of very varied interest. In regard to the great schism of modern days between the realists and the idealists in art, it is worth note that in this year's Exhibition the pictures which may be selected as being the most prominent in interest, as almost competing with each other in popularity, are the two purely ideal works of the President, and the absolutely realistic representation of a modern subject, "The Doctor," by Mr. Luke Fildes, which is hung in what is more or less the post of honour at the top of the long gallery. Sir F. Leighton's "Perseus and Andromeda" (147) to take the ideal first, represents Andromeda not, as usual, nude, but partly draped in white, leaving a good deal to be seen however of a finely-drawn figure with that unreal and decorative flesh surface, as smooth as ivory, which in itself removes a painting out of the category of reality. The head is thrown to one side in a half-fainting terror of the dragon which climbs on the rock behind and overshadows her with one wing, so that the face is seen foreshortened, a favourite problem of this painter, which he has fully mastered. The dragon does not persuade us much of his anatomical possibility of construction; his lengthened tail (which may be ever so much longer beneath the water) is too much for him to carry. On the whole the picture hardly adds to one's conception of the ancient legend. "The Return of Persephone" (232) is a much finer production; Persephone floats up from the nether regions under the conduct of Mercury, whose head is very noble, towards a wide opening through which are seen the bright sky and the figure of mother Earth stretching out her arms in rapture towards her child. The colour effect of the draperies is very fine, and the legend is warmed by a degree of human interest and feeling pervading it. But neither of these two pictures of ancient legend is so striking in conception as Mr. Waterhouse's remarkable picture of "Ulysses and the Sirens" (475), unquestionably the finest work he has ever sent to the Academy. He seems to have mixed up the Sirens with the Harpies rather; his Sirens are more than three, and are great birds with beautiful women's heads; one hovers over the bound Ulysses, singing close to his head as if to flood his ears with her song; one perches on the bulwarks of the galley and sings piercingly at one of the rowers, trying to force him to hear her through the bandages swathed over his head, he looks at her as he pulls at his oar with evident fascination. The details of the ship are well conceived; but the merit of the work is the intensity with which it realises the fable; one can never read the legend again without thinking of this picture.

Mr. Fildes's painting, "The Doctor" (199) is a very large canvas, showing the interior of a labouring man's cottage, lamp-light struggling with coming dawn, and the doctor, evidently a rural practitioner, a "Gideon Gray," sitting with his gaze intently fixed on a sick child laid on pillows on two chairs; the father stands, a somewhat stoical figure, behind, the poor mother bows her head on the table. Every detail in the room is carefully painted, and the attitude of the doctor is admirably expressive of concentrated attention; the whole is pathetic from its truth, as the real scene would be pathetic: but is it in the true sense a "picture"? We think not; the moral interest overrides the artistic. The less prominent work by the same artist, "On Strike" (77), is much more of a picture; it seizes a moment when the four figures are so grouped as to make a pictorial whole; the colour, though there is too large an expanse of brick wall and corduroys, is finely treated within its limits. This is a kind of moral picture too, a lesson against strikes, but there is something in it besides the mere *morale*. In presenting this as his "diploma" work, Mr. Fildes has been more generous than some Academicians who seem contented to get rid of a second-rate work in the diploma gallery; but Mr. Fildes has put his best into this.

Mr. Tadema's "An Earthly Paradise" (298) has been a surprise; no jaded Roman life, but a young mother, who may be meant to be modern, though still a little Greek-ly draped stooping over her naked infant laid on a couch of very artistic and unusual design. The two figures are in the same plane, almost bas-relief-wise; the mother's stooping figure very graceful, the child beautifully painted. The marble basin of a fountain and a bit of stained glass window, seen through a door, give an additional touch of colour and decorative effect to a charming work.

The above-named works perhaps exhaust the temptation to turn in any special direction, and we may note the principal figure-pictures, portraits, and landscapes, successively in the order of hanging. Mr. Britton Riviere's "A Mighty Hunter" (20, 21, 22) is a triptych of which the centre panel shows an Assyrian magnate lion-hunting, prepared to plunge a spear down the throat of a lion who grasps with muscular fore-paws at the back of the car, and is half dragged along in the sand, though with difficulty, by the straining horses. The lion is very vigorous in action. A semi-pathetic touch is given by the side panels, in one of which the lions are seen enjoying themselves in the starlight, the next night (on the right) sees the lion roaring a requiem over the dead lioness with the heavy arrow through her neck. There is a fine touch in thus giving the lion's view of the matter, and the picture has thus an impressiveness which animal pictures, however well painted, seldom have. Mr. Dendy Sadler's "Uninvited Guests" (58), a young roué served with a writ while at cards and champagne on his own lawn, is not a very good work; there is character (of a disagreeable kind) in the figures taken separately, but they stand out harshly against the equally harsh mass of the grass and trees; the pictorial effect has failed.

Mr. F. Dicksee's "The Crisis" (115) is another picture of the sick-room, a man seated watching by the bed of a woman in mortal illness; her face pale and unconscious; a fine and pathetic picture, though the painting of the man's face is somewhat harsh and crude. Mr. Millet gives us in "The Widow" (162) another of those interiors in which the perfect execution of furniture and accessories of the room is of more importance than the figures which occupy it. Passing into Gallery III. we find a very clever picture by Sir John Gilbert, "Don Quixote discourses

on Arms and Letters to the People at the Inn" (225). The conception of the Don is admirable in its mixture of grotesqueness with a chivalric dignity which evidently induces most of the company, especially the fair ladies nearest him, to take him seriously; it is only the lower orders in the company who have a smile on their faces. This is a worthy illustration of the spirit of Cervantes. Mr. Calderon's "St. Elizabeth of Hungary's Lact Act of Renunciation" (226), when she threw off her worldly dress and bowed naked before an altar, is somewhat marred in sentiment by the obvious use which has been made of the story to introduce a nude study, which moreover is a little stiff in its lines; the studies of the ascetic and harsh old monk and the kneeling nuns are finely contrasted. Mr. Gow's "Queen Mary's Farewell to Scotland" (250) is a well-painted group of horses and horsemen, but does not tell its tale with much effect. Mr. Marks has arranged a most piquant and ably-executed group of cockatoos, with expressions somewhat too human, under the title of "A Select Committee" (259). Mr. W. Orchardson's "An Enigma" is an admirably-painted Louis Seize interior with two figures in Directory costume, a man and a woman seated in opposed attitudes at opposite ends of a sofa, she with her upraised head turned away from him and leaning on her hand considering the enigma for the solution of which he waits; this is a real picture, only a little disappointing from having less than usual of the intellectual point and interest which we usually do not look for in vain in the works of this artist. In a central position on the south wall is Mr. Reynolds Stephens's graceful decorative painting "Summer," a series of light-robed damsels, rather in the manner of Mr. A. Moore, seated in different attitudes on a seat which runs the length of the picture. This, a prize design in a students' competition in a former year, has been executed for the Royal Academy as a mural decoration, on a larger scale, in the refreshment-room, where unfortunately it is not in a very good light. As a decorative mural painting it is admirably in keeping with its purpose. In the same room Mr. Poynter exhibits a miniature edition, very finely finished, of his picture of the Queen of Sheba's visit to Solomon.

In Gallery IV. is Marcus Stone's "Love at First Sight" (325), brightened by a very pretty girl, but a theatrical sentiment and style spoils the whole. Near it is one of the most noteworthy pictures of the year, Mr. Crofts's "Morning of Waterloo; Napoleon's Headquarters" (332); the scene is outside a rural "estaminet" where are grouped a number of staff officers and some sentinels and dragoons in waiting, one of whom leads by a rope the unlucky peasant who has been impounded to give evidence about the run of the country. The group of officers is most spirited, especially the one standing with his back to the wall of the cottage; there is a feeling of expectancy of a great event about the whole, which is raised to intensity by the glimpse we have, through the open door, of the figure of Napoleon seated, with his finger on a map on the table, half lighted by a tallow candle stuck in a bottle, and with the anxiety of a momentous issue depicted in his face. The whole scene is most impressive, and is one of the most real things of this kind the artist has ever done.

In Gallery V. there is nothing in figure-subjects to detain us beyond Mr. Waterhouse's work already described. Mr. Sargent's "La Carmencita" in Gallery VI. (544) is a startling but most brilliant and clever picture of a Spanish (?) dancer in stiff outstanding spangled skirts of brilliant yellow which contrasts strikingly with her brunette face and black hair; the pose of the figure, as if just about to commence a dance, is admirably true and energetic. Mr. Eyre Crowe's picture of Jeremiah Horrocks arriving in haste from his clerical duties to catch the transit of Venus (550) is chiefly remarkable for the odd kind of instrument of observation represented, a long kind of gun-barrel tube through which the sun apparently is to be trusted to shine straight and project his disc and the shadow of Venus on a white board fixed opposite. We should like to know the authority for this curious piece of mechanism. Those were not the days of equatorially-mounted telescopes with clockwork to follow the movements of the heavenly bodies, and the arrangement is calculated to excite scientific scepticism.

Mr. Goodall's "Parthenope" (574) in Gallery VII. is a life-size nude figure of a nymph seated in a rocky cavern, the shadows and reflections from which do not seem to have any effect on her very white body; the lighting of the figure and the scene appear in fact incompatible, though the figure is very graceful. This should be an ideal subject, but ideality is wanting, it is only a life study, and rather *fade* for that. "After the Night's Fishing" (639) by Mr. Terrick Williams, apparently painted under French influence, is a very able little work representing a group of fishermen on the sands; a picture, and not a mere study of fishing costumes. Mr. Val Prinsep's elaborate painting with many figures, "The Emperor Theophilus chooses his Wife, A.D. 829" (649) is brilliant but hard, and rather a study of costume than of character. Mrs. E. Normand still keeps the name of Henrietta Rae in the catalogue, which is attached to a very pretty nude study under the title of "La Cigale" (664), not however equal to some of her former works.

Gallery VIII. contains two interesting paintings of ecclesiastical scenes of a very different type, Mr. Lorimer's "Ordination of Elders in a Scottish Church" (685), and Mr. John Collier's "Waiting for the Accused" (696); the latter an Inquisition picture, the former an almost merciless study of harsh and unsympathetic figures listening to the prayer or exhortation of the minister at the head of the table. Mr. F. Dicksee's "Mountain of the Winds" (714) occupies the place which was in two or three years occupied by Mr. Solomon's large and obstreperous paintings. This is an allegorical representation of the four winds, of considerable power, especially in the keen figure of the North Wind, drawing his sword as he prepares for his flight. This is a class of work which we formerly only expected to meet with in the *Salon*, but which is gradually gaining a footing on this side of the Channel. Mr. Solomon makes his appearance in Gallery X. with a large picture of the "Judgment of Paris" (988); the shepherd himself is suppressed, but Aphrodite stands up in the centre of the canvas, a noble and very finely-designed nude figure, perhaps the best in the exhibition. She has little enough of the goddess about her, and Pallas and Herè still less; the ideal of the story has totally failed, but it is a good piece of painting. Mr. Arthur Hacker's picture of "Christ and the Magdalene" (1,086) in the next room is one of the attempts at a realistic treatment of New Testament incidents of which we are likely to see more from time to time; it is utterly at variance with the Bible narrative, the Magdalene kneels to Christ in the carpenter's shop; but in its way it is very beautiful and pathetic, and a picture not to be passed over without careful attention. Mr. Stanhope A. Forbes has hardly repeated, in "Soldiers and Sailors,—The Salvation Army" (1,118) his brilliant successes of the past two years; individual figures are, perhaps, as well studied and as characteristic as ever, but there is nothing like the dramatic interest of his previous works.

Of all the portraits of the year, some of them very fine, probably few will question that Mr. Alma-Tadema's of Mr. A. J. Balfour (143) is the best. It is a simple likeness, with no attempt at pictorial effect; the statesman is seated sideways to the spectator on a sofa covered with a buffalo skin, his hands clasped and his face turned slightly upwards, with an expression in which a certain languid ease is combined with a suggestion of latent power. Sir F. Leighton's forcible and still more simple and straightforward portraiture of Mr. A. B. Freeman-Mitford faces it on the other side of the Andromeda. Of Sir J. Millais's portraits that of "Mrs. Chamberlain" (237) is unquestionably the best, and one of the finest and most attractive portraits of the year. The fine face is painted with more delicacy and care than has been usual with the artist of late years; the pose is very dignified, the scheme of colour very refined and delicate. Mr. Orchardson has produced a remarkable portrait of Sir Andrew Barclay Walker (430), which shows what a great colourist (for such, though in a rather eccentric way, we hold Mr. Orchardson to be) can make of a prosaic presentation portrait. It is impossible to analyse the colour; it is the artist's own original possession; what we feel is that while the everyday English gentleman's costume is given in a manner sufficiently realistic for a matter-of-fact portrait, it is yet taken out of the region of commonplace by the remarkable and subtle scheme of colour under which it is conveyed. The head in this portrait, too, is painted with great power and firmness. Mr. Ouless's "Duke of Sutherland" (294) is a fine portrait; the same painter has been unkind to Mr. John Morley (266) in depriving the lower part of his face of all its characteristic expression of firmness and power. Mr. Watts's "Lady Katherine Thynne" (304) is an exquisite piece of colour, but surely very artificial and stiff in drawing and pose. Mr. John Faed's half-length "Portrait of a Lady" (447) in black is remarkable for the forcible though rather hard painting of the features; and another noticeable half-length is Mr. Richmond's "Mrs. Wrightson" (487), in a deep black dress from which the face, the only light in the picture, is thrown out with animated effect. Mr. Seymour Lucas exhibits a curious and characteristic little portrait of Mr. Alfred Gilbert engaged in modelling a piece of metal-work; an artist's portrait of an artist, frank enough and certainly not idealising the sitter. Mr. Sargent's "Mrs. M——" (1097) is the class of portrait by him which it is the fashion to admire now, a large angular-looking figure in an ugly dress preternaturally pinched at the waist and expanding into an immense bunch of skirt below; the face is no doubt exceedingly life-like and expressive, but the whole work is ostentatiously ugly and ungraceful. Among other portraits worth attention may be named Sir John Millais' "Mrs. Herbert Gibbs" (20), Mr. J. C. Hook's portrait of himself (40), painted for the collection of artists' portraits in the Uffizii Gallery at Florence; Mr. Orchardson's "Mrs. Walter Gilbey" (205); Mr. Pettie's "Sylvia" (283), obviously a portrait though not so catalogued; and Mr. Collier's "Mrs. Harry Coghill" (531).

Among landscapes Sir J. Millais' "Lingering Autumn" (293) will be looked on by most people with rather mingled feelings. Beauty or sentiment it has none; it seems almost defiantly to ignore these qualities. It is a most careful and real study of marshy foreground with tufts of bushes growing about in it, reproduced without apparently the slightest attempt to make anything like a landscape picture out of it. That surely is not the object of landscape painting. The scene is admirably painted, but it was not worth painting. "Glen Birnam" (432) is not so fine a painting, but a better picture. There are some fine landscapes this year, however; none finer than Mr. Adrian Stokes's one painting, "Through the Morning Mist" (615), the work of a landscape-painter who is master of his subject, instead of letting his subject be the master of him. The material is simple enough; a meadow and cattle, a wood on the right, and a misty morning atmosphere; but the artist does not look at nature merely to copy her details, but out of these to create a poem. There could not be a better example of the fact that the real, the intellectual interest of landscape painting, lies not merely in the subject itself, but in its relation to the mind of the painter; its transfusion, as it were, through his mental personality. This is what is recognised in French landscape

rt and too often forgotten in English. We o not notice any landscape in the exhibition qual to this one, in this particular kind of nterest. Mr. Hook, who is a genuine artist landscape, is hardly at his best this year: is contributions include a south of England past scene (33), "Willing Helpmates" (177), Dutch river scene of the "Brimming Holland" type, and "Summer Pleasures" 299), figures by the seaside, the best of the ree. Mr. MacWhirter's "Bolton Abbey nd Woods" (102) is a pretty landscape, so lso Mr. East's "Reedy Mere" (142) but he as done much better things than this. In r. H. W. B. Davis's "Skye Hills from pplecross" (184) the stags in the fore- round make the interest of the work, ather than the landscape; this however not the case with his "Gleamy Day, icardy," (288) which is a fine breezy land- ape in his best style. Mr. Brett does not ontribute one of his large works this year; e small "Gull Island" (424) is a charming w edition of an effect of bare sand and sunlit aves which we have had before; of his rger works. "Some Fell on Stony Ground" 00) and "The Highland Summer" (1,029) e latter is the finest, and is a picture of mist nd rain and sunshine intermingled which rows upon one as it is studied, though not inviting at first sight as some of its author's orks; especially to be noticed is the effect the gleam of the sunlit grass shelves of the ffs through the mist, when every other part them is lost to the eye. Among other ndscapes may be just mentioned (for we nnot prolong these notes) Mr. Arthur mon's "All Among the Barley" (1,036) r. MacWhirter's "A Highland Bay" 04), a fine panorama; Mr. Vicat ole's diploma work, "Autumn Morning" 37), one of the "pretty-pretty" order of ndscapes, but a very pleasant specimen its class; Mr. David Murray's "Gorse" 19), and (still better) his "Mangolds" 06), reminding one of "The Young Wheat" last year, but hardly equal to it—there is t the same spaciousness about it; Mr. H. oore's two smaller sea pieces (586 and 602), his principal work (192) the waves are lly somewhat too solid and thickly laid on; r. F. G. Cotman's "Corfe" (595); Mr. J. glis's picture of a desolate moor under the ting sun (650); Mr. C. E. Johnson's Killiecrankie" (510); Mr. Kenneth Mac- nzie's "In Drowsy Summer-time" (1,016). d Mr. Shaw's "Bolt Head" (1,071), a very l picture of sea breaking on a rocky coast der a stiff breeze, granting that you catch sea in the particular atmospheric con- ions which give it that colour, which it sometimes but not very often.

NOTES.

ON Friday last week the International Art Exhibition at Berlin was officially declared open, the ceremony on the occasion being of great splendour, in spite of the urning garb of the Court and dignitaries o participated. The ceremony proper took ce at 12 o'clock, a few minutes before ich hour, first the Emperor and then the wager Empress, together with the Empress, ved. The invited guests, the exhibiting sts in town, the delegates of the different ups, the members of the various Exhibi- committees, and a large number of vernment and municipal officials had ady assembled at 11 o'clock: and 11.30 the Cabinet Ministers. Court digni- es, &c., together with the Ambassa- s of England, Austria, Spain, Italy, the United States collected at the main rance to await their Majesties. On ering the building, walking between two s of heralds bearing the arms of the ntries represented, the Dowager Empress by the Emperor William, and followed by reigning Empress) was received by the naging Committee, headed by their chair- , Anton von Werner, who, in his address, ging her Majesty to open the Exhibi- , alluded with great tact to the advan- tages countries enjoyed during times of peace, and then went on to honour the memory of her late husband, as a friend of art, and a guardian of its interests. The Empress Frederick, deeply moved by the address, answered with a few almost inaudible words of thanks, and then asked her son, the Emperor, to declare the Exhibition open, which he did with the words, "It is in the name of the Dowager Empress that I herewith open this Exhibition." Then, turning to his mother, the Emperor William, in a loud voice, said, "I thank your Majesty, in the name of the assembled artists, for so graciously having accepted the patronage of this Exhibition. The strong artistic feelings of your Majesty and my deceased father are the direct cause of our having to-day been able to celebrate an event important in art annals. I thank you in the name of the artists for your appearance here on this fête-day, to which your presence has given an added brightness." Hereupon his Majesty called upon the assembled artists to give his mother three "hochs," which request was enthusiastically responded to. After exchanging words with several of the dignitaries present, the Royal party, conducted by the Managing Committee, took an hour's walk through the main halls of the Exhibition, the above-mentioned heralds keeping the way. After their Majesties had left the grounds, a party of some 500 gentlemen were guests of the Managing Committee, who gave an official banquet in honour of the occasion.

MR. GOSCHEN had no need to ask for the indulgence of his audience at the Royal Academy banquet on Saturday, in that he occupied the place of a substitute only, for he made one of the best and most pointed after-dinner speeches which has been delivered on that annual occasion. He touched, though with a light hand, on one of the serious problems of modern art, the want of the elements of picturesqueness and heroism in modern life. Men, especially Englishmen, are quieter, less demonstrative, in their life and actions than in the days of the Renaissance. As Mr. Goschen gazes on the portraits that adorn the walls he receives the impression "of a general sense of peace and plenty and prosperity, of the claims of life honourably and satisfactorily discharged, and of the goods of this world gratefully enjoyed," and he reads in the faces of these men "a blameless record of duty comfortably performed and taxes punctually paid." We do not know if Mr. Goschen remembered the remark recorded in Haydon's autobiography, at a gathering at the Louvre shortly after Waterloo, to the effect that the English, as compared with the numerous other nationalities represented, produced chiefly the impression of "having a good balance at their bankers." This is certainly the impression given by the majority of the portraits at the Academy —that and in some cases nothing further. There are elements of heroism and picturesqueness in modern life, but they are not very prominent, and when they are, they are often not such as to afford much matter for the painter. The higher part of life is more inward than outward nowadays; and painting is chiefly concerned with the outwardness of things. We cannot refer to the Academy banquet without a word of acknowledgment as to the general excellence of the speeches, Lord Justice Bowen's being perhaps the very best, a model after-dinner speech in its light but witty banter. The introduction of "Music and the Drama" as the subjects of a toast was a happy innovation, which we hope will be adopted for the future.

MR. THOMAS VERITY, Fellow of the Institute of Architects, whose death is recorded in another column, was an architect of great practical ability who during many years back had carried out a large number of works. He made his first success as architect of the "Criterion" building for Messrs. Spiers & Pond, which was gained in competition. The architecture of that well-known establishment represents pretty fairly the general tendency of his architectural work, which was in accordance with the taste of a very large and influential section of the English public; the taste which demands dignity and a sumptuous and rich class of Renaissance treatment, without going so far as to demand architectural originality of style or detail. Mr. Verity's best powers lay in his capacity for the practical planning and laying out of a building, and in a readiness and grasp of his work which were of great value both to himself and his clients when large architectural schemes were to be carried out with rapidity; and it was this capacity for dealing readily with problems of planning and practical provision, of perceiving exactly what was wanted and providing it, which perhaps more than anything else ensured him his well-earned success in numerous competitions. In the somewhat well-worn Classic materials with which he usually worked he was thoroughly at home, and his buildings were always well-proportioned and dignified, if they could not claim the merit of high originality. He and his partner Mr. Hunt were among the nine architects selected for the second competition for the War Office, in which they stood very well, and produced a design which, if somewhat heavy, presented, for its purpose and site, very good qualities both of plan and design.

IN the issue of *L'Architecture* for May 2 we find the short report of a committee of the "Société des Architectes Français" in regard to the proposition to institute a professorship at the École des Beaux-Arts for instruction in the administration and accounts of building work, as a part of the architect's professional training. The committee is in favour of the proposition, as tending to the completion of a necessary portion of an architect's education, although it may seem a matter which is beyond the range of a fine-art academy. They observe that the École des Beaux-Arts course already includes technical instruction in construction, physical science, and legislation, which are not artistic subjects; that this course occupies so much time that it is impossible to add anything to it, and that therefore there now exists a "lacune" in the scheme of architectural instruction. "The architect," the reports says, "is an administrator; he ought to foresee the expenses, and fix and regulate the price of work executed under his orders. This part of his professional work is not the least important one, and considerable inconvenience would arise from his entrusting this part of the work to irresponsible subordinates. It is therefore to be desired that our national School, which generously lends itself to all the scientific and artistic knowledge necessary to the profession, should from this time instruct young architects in the indispensable elements of the general accounts of building work." It appears quite clear from this that the French representative body of architects does consider architecture as a "profession," and not purely an "art."

THERE is a decision in the current number of the "Law Reports" by the Court of Appeal which is of some practical value to landlords and tenants. A lease of a house contained a covenant by the lessee to pay rent on the usual quarter days, and a proviso for re-entry "if and whenever" any one quarter's rent should be in arrear for twenty-one days, and no sufficient distress could be levied. At Lady-day, 1890, there being three quarters' rent in arrear, the lessor distrained in April, with the result that there was not sufficient realised to pay off two quarters' rent. The lessor accordingly brought an action to re-enter the premises, and it was held that he was right in doing so. The curious little point was, of course, that there was enough money realised to pay the last quarter, but not all three quarters. The practical result is that lessors may, under

such circumstances, appropriate the sum realised to the rent due for the first quarter, and bring an action for re-entry in case of the last quarter's rent.

THE sum of half a million which Mr. Goschen proposes to devote to the building of barracks is an important point in his Budget. The expenditure of the money must necessarily conduce to the health and the comfort of our troops. It will also give employment to a large number of masons and other operatives for some time to come. Work of this kind in the winter is very liable to interruption, but there can be no question that every effort should be made by the Government to keep this work in progress, as far as possible, during the winter months. At such time, when work generally is slack, the continuance of large public works is a great boon to the working classes.

AN institution is to be founded in Germany for the purpose of assisting in annually making some of the best works of art of German artists national property. This institution, which is to be founded under the auspices of the Prussian Royal Academy and the Art Societies of Dusseldorf and Königsberg, will be under the patronage of the Emperor. The necessary funds are to be raised by voluntary contributions. The published prospectus states that, owing to the Government not being able to vote large sums for the purpose of making works of art public property, it is expected that the few rich, who up till now have alone had the privilege of being in possession of such works and deriving pleasure therefrom, will readily contribute towards a scheme which will assist in making such pleasures more easily attainable to the community at large.

THE American *Journal of Archæology* has just issued its last number for 1890. We regret to see that this journal is, in the matter of original articles, getting thinner and thinner. Considering that it professes to treat of "all branches of archæology and art, —Oriental, Classical, Early Christian, Mediæval, and American,"—two articles on original subjects, one of them very brief, is surely a meagre put-out. The journal has rendered conspicuous service by its periodical "Record of Discoveries" and "Summaries of Periodicals," in which it quite justly claims, *quâ* completeness, to stand alone. The work done by others is very ably condensed and made accessible to the educated public. But we want something more than a "Review of Reviews." Archæologists are beginning to be surfeited with this unpalatable and non-nutritious pemmican. We have like summaries (though, we own, less complete) in the Prussian *Jahrbuch*, in the *Gazette Archéologique*, and the Athenian *Mittheilungen*, the *Classical Review*, and many another periodical. No one will think our strictures overdue if they note the proportions of this last number of the *Journal*,—thirty-eight pages of original work to 137 of correspondence, reviews, summaries, &c. This is surely considering the general public rather too much, and the specialist too little. The two original papers are, however, of interest. One by Dr. Murray on a vase of Mykenæ type in New York; the other, a report of the Platæa excavations of the American school, by W. Irving Hunt.

IN December, 1889, we informed our readers that a set of new police regulations referring to the safety of theatres had come into force in Prussia. These regulations were dated October 29, 1889. It has been found that the paragraphs which refer to existing buildings were too stringent, and would have in many cases required these buildings to be altered at an unreasonable cost, or to be entirely rebuilt. After due consideration the authorities have, therefore, consented to permit of some leniency in several of the points most complained of, and have now (May 2) officially published the wording of the remodelled paragraphs signed by the Government on March 18. Of the points altered, we may mention one which refers to the main wall between the stage and the auditorium of existing theatres, not required to be of stone or brick (as required in 1889), but of any so-called "fire and heat proof" material thought advisable; and another which relates to the electric-lighting of existing theatres with more than 1,200 seats, which was formerly distinctly required in lieu of gas (which had to be cut off), and now is not thought absolutely necessary, gas-lighting throughout the building being permitted if the authorities consider the exits adequate.

A KIEW engineering journal publishes a description of a church on wheels, such as has been lately used on the Baku-Tiflis section of the great Trans-Caucasian Railroad as an improvement on the make-shift of an open-air place of worship adapted for the workmen in the district. This church,—a railway-carriage on eight wheels,—has a length of 14·7 mètres inside measurement, of which 3·3 mètres have been divided off for the altar. The Iconostasis behind the altar is of carved oak, highly decorated with the pictures of saints on a gold background. The decoration of the walls is kept simple in the extreme, a white background being used. The ceiling is tinted light blue, and is sprinkled with golden stars. The exterior has the ordinary appearance of a Russian railway-carriage, except that the panels are decorated with Russian double-crosses, and that a small golden double-cross has been placed over the altar-end of the car, and a small belfry, with three bells, on the opposite,—*i.e.*, entrance end. This original place of worship was consecrated in September last.

THE picture of "Calais Gate," otherwise known as "Oh! the Roast Beef of Old England!"* which was included in the sale at Christie's on Saturday last, was painted by Hogarth on his return from a visit to France in 1748. The print, engraved by him and C. Mosley, appeared in the following year. Pine, the engraver, sat for the Friar's portrait; and Grandsire—see the direction upon the joint in the cook's hands—was the name of the man to whose custody Hogarth was committed until he should quit Calais for England. Hogarth's insular prejudices, which he rudely displayed abroad, were by no means dispelled by the treatment he received at Calais, and he found further vent for his dissatisfaction in his plates of "France" and "England" (1756), for which Garrick composed some stanzas of the "roasted frogs" and "beef and beer" order. The background chosen by Hogarth, being the seaward gate of the town, must have been familiar to numbers of our countrymen for generations past, and was erected by Cardinal Richelieu in 1635. We believe, however, that the actual gate (of stone) and drawbridge have been cleared away in the levelling, about eight years since, of the fortifications around Calais, and the building of new works by the large and populous suburb of St. Pierre. Mr. Agnew, of Old Bond-street, bought the painting for 2,450 guineas.

ON April 25 last we printed a list of tenders for the re-building and extension of Mrs. Newcomen's schools, in Newcomen-street, Borough. The schools were founded by Mrs. Elizabeth Newcomen, a parishioner, who left certain property in trust to the churchwardens of St. Saviour's "for the clothing of poor boys and girls, once a year, and for the teaching of them to read and write and cast accounts." The number of children benefited has risen from twelve in 1752, when the charity became available, to twenty times as many more. The street, formerly known as Axe and Bottle-yard, and King-street, is mentioned under the latter name in the "Chronicles of London Bridge," by an Antiquary. It appears that on the pulling down of the City gate—as rebuilt in 1726—on London Bridge, in 1760, a fine piece of sculpture, consisting of the Royal arms, with supporters, crest, mantle, &c., was bought, together with other material, by a stonemason of Tooley-street, who used the stones in the construction of King-street. Under the arms "King-street" was added and the original "G. II., R." has been altered to "G. III., 1760, R." Next south of King street (west-end), stood the old Marshalsea prison, which must not be confused with the later Marshalsea of "Little Dorrit."

* A copy of the print was engraved at the head of a cantata, thus entitled.

THE collection of paintings from the Alps by M. Loppé, now on view at the Fine Art Society's Galleries, is perhaps more topographically than artistically interesting. There is a good deal of sameness in a number of paintings in which snow and ice are the predominating features, nor is this we suspect, the most difficult kind of landscape painting. M. Loppé's experience has given him a power of getting exceedingly realistic representations of snow in various lights; the most noteworthy of these is "The Valley of Zermatt" (51), in which the half-lights on the left slope, partially reflected from the opposite snow, contrasted with the deep blue shadow outlined on the bottom of the valley, are very real. The constructive character of glaciers is well conveyed, as in the "Mer de Glace at its fall into the Valley of Chamounix" (19), crinkling and cracking as it bends over the declivity; and in "Ice Aiguilles at the foot of the Glacier des Bossons" (34). The large picture of "Crevasses on the Mer de Glace" (68), with the immense jagged blocks, earth-stained on the upper part, and disappearing into the cold blue of the chasm, is very effective. There is a want of indication of scale in the pictures, but that is a characteristic of Alpine landscape itself, and therefore perhaps this is only another element of truthfulness in the representation.

THE Belgian Architectural journal *L'Emulation*, is devoting a series of articles to the Colleges of Oxford and Cambridge, signed by M. Paul Saintenoy, the editor. The articles do not go very much into the architectural interest or history of the buildings, except in the addition of a few illustrations.

WE perceive that an Australian architectural journal is very angry with us among other things, for having spoken slightingly of the state of architectural art in Australian cities. If the illustrations of new buildings which the Australian journals publish are a fair representation of architectural design in the Australian colonies, we do not think there will be much difference of opinion in regard to them on this side of the globe. If there is anything better to be had, let them produce it: no one will be more glad to see it than we shall.

ANOTHER PROJECTED SHIP CANAL.—A provision of the last American River and Harbour Bill authorised a survey to be made for a ship canal to connect Lakes Union and Washington, back of Seattle, with Puget Sound, and appropriated 10,000 dols. for the purpose. The entire length of the canal from tide-water to deep-water in Lake Washington, including the two miles of channel through Lake Union, will not exceed five miles. Less than two miles of this is through upland, and more than a mile is through the soft, muddy bottom of Union Bay, which is covered by from 8 ft. to 10 ft. of water. The upland excavation will be through the lower portage between Union Bay and Lake Union, and Lake Union and Salmon Bay, the former being three-eighths of a mile and the latter one and one-fourth mile in length. Through both of these portages flow streams of water, small canals having been dug by private enterprise several years ago. The maximum cut will be about 40 ft., and there will be no excavating in rocky or difficult formations, while the elevation to be overcome by locks from the level of the sea to fresh-water level is but 10 ft. The building of this canal would afford Seattle some of the advantages possessed by Portland in the Columbia river.—*Iron.*

ARCHITECTURE AT THE PARIS SALON.

THE endeavour made, on the part of the committee of the old Salon, to rival the comfortable installation of the rooms of the Champ de Mars Salon last year, has had a certain direct effect in benefiting the position of the architectural exhibits. We have several times remarked on the isolation in which architecture seemed to be left, apparently systematically relegated to a desert only likely to be visited by a few specialists; a state of things which appeared the more singular when we consider that the President of the Société Française is an architect; and if his good taste or modesty forbade him to interfere on behalf of his own craft, at all events the painters and sculptors who are the majority in the Society might have been expected, even out of courtesy to their venerable President, to see that architecture was as well treated in the building as the other arts.

This year there is at all events a certain progress in the right direction in this respect. Architecture occupies nearly the same neighbourhood as before, at the east end of the building, but being thrown *en suite* with and enclosed by the painting galleries, the architectural rooms are at all events less isolated and do not look so much like a passage leading nowhere. It is to be hoped that under these circumstances the public may by degrees get into the habit of looking at the architectural drawings a little.

The number of architectural drawings is rather greater than during the two or three previous years. Sketches made abroad seem to be more numerous year by year. This is not to be deprecated, for sketches of this class, though perhaps a light labour of repose to the architect from more serious studies and more technical drawing, are to the general public the most attractive part of the architectural show, and as they are distributed pretty evenly among the other works, they may form rallying points for visitors who are scared by the more formal and learned-looking technical drawings.

Among this class of sketches are prominent those of M. Brun, a young pupil of M. Guadet, who has been sketching mostly in the south of France, and handles the pencil in a free and clever style. The sketches by M. Chambers combine great simplicity of method with a very careful attention to details. M. Gavet has brought some slight but interesting sketches from a tour in the Upper Alps.

M. Ghesquier has made a very careful and conscientious set of studies chiefly of Flemish towers and belfries, a class of sketch which has been a good deal illustrated in previous salons. His water-colour drawings are interesting, but a little heavy in tone and colouring. Among the most noticeable is a view of Orchies and of the Pont Napoléon at Lille. M. Mayeux has been sketching in Brittany, and his sketches at Penmarck, St. Pol de Léon, Roscoff, Plouganou, and Auray, give very faithfully the aspect of these curious and out-of-the-way places. M. Mayeux is an artist, however, of considerable power in other ways; he designed the bronze blasts for the Place de la République, and is the author of a highly esteemed book on decorative composition. The pen drawings of M. Piñon at Loches are very accurate, but rather hard. Those of M Whitney Warren transport us from the north of France to the south of Italy. Those of M. Vernon of the Château of Blois are interesting and evidently very conscientiously made. A slight water-colour tint, without interfering with the precision of the lines, serves to indicate the tone of the façades and the manner in which brick and stone are intermingled.

Among travelling sketches executed abroad may be mentioned the view of the Forum at Pompeii by M. Boitte, which, although rather hard, recommends itself by its great ability in draughtsmanship. M. Daumet has brought from Austria two charming studies of the organ screens and the nave of St. Stephen at Vienna, water-colours showing great ability both in drawing and colour. We may also mention the drawing of the mosaics of the Baptistery of Ravenna, by M. Chapelain de Canbeyres, M. Demay's Italian studies, and M. Pradelle's sketches in Venice, which are beautiful both in colour and sentiment. The view of Westminster by M. Paul Normand shows rather an unpractised hand.

In the centre of the first architectural room is a small model in plaster of the monument in memory of the Bretonne-Angevine Confederation of 1790. This monument, actually in course of construction at Pontivy, is the joint design of M. Deperthes and his son. A large surbase decorated with bas-reliefs carries a heavy column covered with inscriptions on the side towards the principal face; above it is the genius of Liberty. The whole is finished by a tripod crowned with flames. The total effect is somewhat heavy and not very decorative.

Not far from this we find M. Deslignière's monument commemorative of Bourget, which was illustrated some time since in the *Builder* in connexion with an article on monuments of the war around Paris. Why the architect should re-exhibit a design executed a good many years ago is not very apparent. The Danton monument, which is being constructed on the Boulevard St. Germain, is, as far as the architectural portion is concerned, the work of M. Lépouzé. It is a commonplace pedestal with a bas-relief, by M. A. Paris, of various emblems combined with inscriptions. The whole is to be surmounted with a group of some vigour of action, which will be found not far off among the sculpture.

In civil architecture we remark especially the design by M. Antonin Durand, submitted in a competition opened last year for the Caserne des Célestins, and which was classed second; the execution of it was entrusted to M. Hermant. M. Durand has grappled successfully with the difficulties of the site and the demands of a complicated programme of instructions; his design is shown in six drawings very ably executed. The same architect entered into competition for the professional school of cabinet-making in progress in the Rue de Reuilly. The plan is well laid out, and the elevation shows a simplicity in keeping with the destination of the building. The introduction of faïence and tile-work in the façade is the only exception to the general severity of the design.

The building of a Hôtel de Ville at Valence this year has called into existence a certain number of designs, most of them rather common imitations of recent municipal buildings in or around Paris. Is it also at Valence that M. Ancian has created or wishes to create his façade flanked by two little turrets with such odd effect? The catalogue only says "for a town in the south."

M. Hourlier, who entered into the competition for the decoration of the Galerie Lobau, has re-exhibited his cupola designs. We can only concur in the opinion of the jury of the competition, which eliminated them at the first examination. The decoration exhibited by M. Hista and executed by him for the Collège de France, under the direction of M. Gerhardt, is better. This decoration is for an arcaded portico bearing the name of Letarouilly, who was architect in chief of the college at the commencement of the century. The figures which form part of the design are by M. Urbain Bourgeois.

The design for a Hôtel de Ville for Mans by M. Schmidt is sufficiently decorative, with a fine façade raised on a double flight of steps. M. Koch, a Swiss architect residing in London, exhibits two competition designs, one for a Museum of Fine Arts for Geneva, the other for a Hotel de Ville for Copenhagen. The latter is an interesting work, very well finished in detail and of elegant and original architecture.

Among scholastic and collegiate buildings (not very numerous) we may mention the competition design by MM. Berger & Schüler for the Lycée at Epinal, which is a fine work. We cannot say so much for M. Toudoire's design for an Ecole Normale at Constantine. For forty years past the French architects have been striving to deprive Algiers of its local colour. Without wishing to see a pretended Moresque style set up in the modern buildings there, it is surely possible, instead of the barrack-like buildings imported by French architects, to find an architecture more in relation with the country and manners and the climate of Algeria.

The "Ecole professionelle" exhibited by M. Henry shows some good interior detail, careful drawing and a pretty though simple façade. The "Ecole Primaire" for Switzerland, by M. Meyer, contrasts agreeably, by its originality of style and construction, with the majority of the scholastic establishments built in various places under the same patron. The same architect, in collaboration with M. Esnault Pelterie, exhibits a vast project for the University and Museum of Lausanne. Towers and turrets, monumental staircases, balustrades, statues, cascades and fountains—nothing is wanting to produce an effect of decorative profusion and an exuberance of ornamentation which seems hardly to be intended quite seriously. At all events we much prefer the fine and more simple design of M. Fivaz for the same situation. For Lausanne also is the design which M. Hennequet exhibits in thirteen carefully-studied drawings, but his elevation has too many reminiscences, especially a certain staircase in a circular tower which seems to have come by the shortest route from Blois. M. Leblond's "Musée de Sculpture" also denotes more of memory than originality, being a kind of mixture of the details of all styles.

The design for the "Palais du Senate" at Bucharest, by MM. Dobresco and Duquesne, has very interesting details and a fine façade, with a large iron grille evidently suggested by that of the Palais de Justice at Paris. We may also mention the Orphanage for Roubaix, by M. Dubois, the warmly coloured façades of which suggest a reminiscence of the Collège Chaptal of M. Train.

Hospital plans are few and of little interest; we may mention however the design for an annexe to the hospital of Compiègne by M. Babel. A birdseye view of the "Hôpital Hertford," founded by Sir Richard Wallace, only gives a very imperfect idea of the establishment. We have drawings of the Abattoirs constructed at Havre by M. David in the style of those of La Villette; the treatment of the isolated portions is not very well carried out. MM. Sonntag, Gueyon, and Pergod have sent designs for a Caisse d'Epaigne for the town of Troyes; the first two are very simple and severe in style, the third somewhat pretentious, but noteworthy for the pleasing design of the grille in front of the building.

We find still some traces of the 1889 Exhibition, especially the building for the "tout Paris" Panorama designed by M. Yvon. Constructions of this kind are to architecture proper much what stage jewellery and ornament is to the real thing; and the same observation will apply to the designs for the new conservatories for the "Jardin d'Acclimatation" by MM. Yvon, Kahenn, and George; the two last named are superior to the first. We may notice in passing, as an example of faithful rendering of exotic architecture, the design for the Japanese pavilion exhibited by M. Gautier.

M. Boileau *fils* has been commissioned to design the buildings for the National and Colonial Exhibition at Lyons, in conjunction with MM. Mignon and Maistrasse. Their design, on three large frames, is very carefully executed; it is an interesting and even elegant one, with a central dome evidently inspired by that of the Champ de Mars, and like it crowned by a winged genius.

The "Jetée promenade" of Nice no doubt prevents the inhabitants of Cannes from going to sleep; and M. Guillot, to satisfy them, exhibits a design the execution of which will scarcely add anything to the charms of that beautiful district, but will spoil at all events the picturesque of one corner of it. In point of style, it resembles all possible casinos. The designs for the Salle des Fêtes for the town of Béthune, by M. Courtois-Suffit, is an agreeable contrast to these vulgarities. This young architect is at the same time an able decorator and an excellent draughtsman. He has composed a very original scheme of decoration, quite out of the ordinary run. The façade, with a great deal of colour, presents an effective combination of iron brick and faïence; and the general style is very suitable to this mode of construction, without having any resemblance to a railway station.

Similar praise may be given to M. Honoré's "Etablissement Thermale." The very decorative façade presents a harmonious combination of marbles, statues, polychromatic friezes, and exterior decorative paintings.

M. Dutocq, whom we regret not to see more often at the Salon, exhibits a remarkable study of the Château d'Ecouen. This *chef d'œuvre* of Jean Bullant has now become a branch of educational establishment of the Legion of Honour. The restoration here shown is a splendid piece of drawing. We may notice especially the loggia of the grand terrace, the porticos with the captives sculptured by Michel-angelo, the interesting series of plans, and a perspective view which has an independent pictorial value. We published some time since an admirable new building, the Mairie of Neuilly, by M. Dutocq, who appears to succeed equally well in the restoration of ancient build-

ings. M. Parguy, who exhibited last year a view of the Château of Maintenon, exhibits this year a drawing of the back elevation of the same building. But his water-colour drawing, correct enough as to detail, is hard in texture and of a vivid colouring which does not convey by any means the harmonious impression of old walls stained by time. We may notice also the fine drawings by M. Ruy of Italian architecture of the middle ages and the Renaissance, as well as his finely-executed details from the ducal palace at Venice. We should not overlook also two views of the Château d'Amboise, one by M. Demay, the other by M. Ruprich-Robert.

Church architecture merits special attention this year. M. Ballu has sent three sheets of drawings of the church at Aulnay, large and bold in character. The "Etat actuel" of the church at Orthis (Seine-et-Oise) has furnished M. Léon Destors with the subject of a large and fine water-colour drawing. This building, classed among the "monuments historiques," dates from the Renaissance; its finely-sculptured portico is flanked by a lofty tower. M. Hardion has restored in a careful drawing the details of the pulpit in the Abbey Church of Beaulieu-les-Loches, built in 1008. The water-colour drawings executed by M. Petitgrand from the church of Auzon (Haute Loire) are very interesting. This architect is one of those specially commissioned to work for the Committee of Monuments Historiques, and adds every year some valuable records to their archives. It is in fact more easy to draw old things than to invent new ones in architecture, and so M. Josso must not be judged too severely for copying the façade of the church at Auteuil for his own at Aix les Bains, nor M. Balleyguier for designing a church for Trois Montiers with obvious reminiscences of that at of St. Pièrre at Montrouge. We have not space to do more than just mention the church for Sables d'Olonne by M. Libaudière, the high altar for Lisieux by M. Louzier, the gates for the transept of St. Maclou at Rouen, in which M. Pauline has faithfully reproduced some fine sculptures attributed to Jean Goujon, and the church of Goussainville by M. Raimbert.

The restoration of the Theatre and Forum of Ostia by M. André constitutes one of the most curious exhibits in the *Salon*. Almost all the works of this class exhibited of late years by the pupils of the Villa Medici have been veritable creations, which do honour to them as artists as well as students. One of the seven frames exhibited by M. André shows the existing state of the ruins. This is the least good of the set perhaps, for M. André is less landscape painter than decorator, and his chief work is undoubtedly the general section of the Forum and Theatre restored. The perspective view is interesting though rather hard in drawing, and the restored section through the stage is painted and decorated with much taste and high finish.

Last year M. Fournereau exhibited drawings of the actual state and the restoration of the Kmer ruins at Bapuan, Angkorthôm. This year M. Deverin shows us, following the report of Lieutenant Delaporte, the Temple of Baion at Ankhor. Nine large sheets of drawings are devoted to this immense edifice. Among the number we give the preference to the general view taken on the east side, from the entry on the terraces. M. Gayet, a pupil connected with the Archæological Mission at Cairo, exhibits drawings representing two funeral pictures of the eighteenth dynasty, taken from the cemetery at Thebes. There is much talent in the antique fragments restored by M. Defrasse, who appears however less happy in his restoration of the façade of the Ca d'Oro Palace at Venice.

The ramparts of Aigues-Mortes have furnished M. Louzier with matter for ten frames of very careful drawings, intended for the collection of the "Monuments Historiques." It is for the same collection that MM. Lafillée and Rouillard have reproduced some old frescoes copied almost to the point of deception of the eye, a regular piece of monkish work demanding almost the fidelity of photography, and an unheard-of amount of patience. M. Paulin, who in 1886 exhibited a fine perspective view intended for a monograph of the Thermæ of Diocletian, sends this year an interior of one of the baths, richly decorated and full of fine detail, and occupied by a crowd of figures.

The present *Salon* is particularly poor in the matter of examples of domestic architecture. With the exception of the "Domaine de Rainville" exhibited by M. Peronne, and the Renaissance Hôtel of M. Dumesme, which has a very elegant façade, the rest are only villas almost all built in the same commonplace style which we find at every step along the coast of Normandy and Brittany. The "Salon" exhibited by M. Guillaume is not so much an architectural work as a pretty fancy, a *genre* picture, which would be more in its place in the neighbouring galleries of paintings. With that reservation this interior scene is very pretty and the details very original.

With M. Dauvergne fancy is certainly allowed her full licence. His "Eden" is a terrestrial paradise where are collected a maze of eccentric constructions intended apparently for the diversions of the youth of Montmartre. Everything is there, wind-mills, cabarets, cooks' shops in full trade, bars, kiosks, and even an Eiffel tower in miniature. M. Dauvergne, to whom we were indebted for the Brazilian pavilion at the 1889 exhibition, could not do better than associate himself with M. Robert de Massy, whom we find again with his grotesque compositions which he calls "Mauresques," but which are rather "Japonaises." We pass over the terrible and ludicrous monument which M. Larche proposes to raise to French Democracy, to examine the fine drawings executed by M. Dargand for M. Duseigneur's work on the "Promenades de Paris"; nineteen compositions of remarkable merit. Like M. Dargand, M. Vignat also produces admirable pen drawings which reproduce very well as illustrations. We may mention especially the arabesques and titles designed for *La Construction Moderne*, which are executed with remarkable spirit and freedom.

Among the funeral monuments two alone appear to merit notice. They are both the work of M. Allar, one of the best pupils of M. Esperandieu, the director of the Cathedral works at Marseilles. One, in the form of a stele, is decorated with a female figure executed by M. A. Allar, his brother, the well-known sculptor. The monument recalls a little that to Gustave Flaubert at Rouen. The other is a chapel in white marble designed for the Greek cemetery at Constantinople, in a Romano-Byzantine style.

We may conclude by mentioning a few students' works from the École; not numerous this year. The electric lighting station of M. Ollivier shows serious study; and the terminus railway station by M. Dusart is a conscientious design, with a façade a little too heavy. The covered market designed by M. Pauline, for the "Concours de Diplome," is a work of some importance, very well drawn and coloured and very carefully considered in detail.

In this rapid survey we have been obliged to omit some names and to pass over some works that were worthy of mention, but not many; and we believe the foregoing notes will give a fair idea of the contents of the architectural *Salon* of this year, which, without offering any works of very special note, is on the whole well up to the usual standard. We hope that the improvements which have been commenced in the arrangement of the rooms will be carried further, and will lead to the architectural drawings taking a more prominent place among the contents of the exhibitions, and contributing in a more important degree to their interest and success.

ARCHITECTURE AT THE ROYAL ACADEMY.—II.

The first drawing in the order of hanging is "Design for Whitefield's Chapel; Interior" (1,727), by Mr. John M. Brydon, the exterior of the same design being shown in No. 1,745. The latter shows a parallelogram block in front, its side to the street line, which is obviously the hall, a design in a plain Renaissance character with apparently shops in the ground story; the interior arrangement is not very easy to understand from the external design; the only range of at all large windows is in the upper story, there is a row of small square windows between this and the ground floor, arguing that there is a mezzanine below the actual hall, which consequently cannot occupy a very large proportion of the cubical contents. In the rear is seen the dome of the chapel, the lower portion of which projects a little beyond the hall. The interior of the chapel, with its dome and round arches, is open and spacious in effect: the defect of the whole is that in the exterior there is little architectural connection between hall and chapel, which do not suggest the idea of a group so much as of one building placed in front of another. Nor can we think the architecture of the most conspicuous front block very inviting; but the architects were tied very close in the matter of expenditure. The drawing (water-colour) is a very good one.

1,728. "Mission Church and Hall for Corpus Christi College, Cambridge;" Mr. R. I. Lovell. A simple and unpretentious brick Gothic building, divided into bays along the side by shallow buttresses which are flush with the lower story of the side wall, and finish at the top with a simple saddleback termination. Three doors at the end give access to the building, and a little sculpture is apparently introduced (rather slightly indicated) in a bit of wall arcade above. The drawing is an artistic and effective one touched in sepia; a plan is added.

1,729. "Study for painting on east wall of Chapel, St. Thomas's Home, Basingstoke;" Mr. N. H. C. Westlake. This is a well-grouped decorative painting, which aims at mediæval fervour without mediæval stiffness. The Cross rises in the centre, the two Mary's on one side of it, one of them kneeling. We do not understand the figure on the other side; from the dedication of the building it should be St. Thomas, but we do not recognise that in the story of the crucifixion; but for the title we should have supposed it St. John, who was prominently mentioned as having been at the foot of the Cross. There is a kind of decorative indication of sunset sky behind, the clouds being treated in natural colour, but the interspaces of western light in gold. We should surmise that in execution the gold would have rather a tendency to appear as the front part of the plane and the clouds as the spaces. Gold in execution on a large scale looks very different from gold in a small drawing. The water-colour is a little coarse in execution; but the general result is good.

1,730, "Palais de Justice, Rouen;" Mr. A. M'Gibbon. A pretty and free pencil sketch, a little spotty in effect but containing a good deal more work in it than at first appears. It seems to have been lined in very faintly in the first instance, and then touched with decisive pencil touches to bring out the prominent portions.

1,732, "Design for Organ, All Saint's, Compton Leek;" Mr. Gerard C. Horsley. A small three-tower case, a good deal on the model of some of the old cathedral and church organ-cases produced in England in the early part of the last century. The drawing, which is rather rough and sketchy, does not show the detail very clearly, but we can see that the design is characterised by very free and exuberant Classical foliage detail, which at the sides flies out boldly into a flanking ornament banging on to the outer tower. This is licentious, but is excused by its bold effect.

1,733. "A Mountain Church;" Mr. G. L. Morris. Two pencil elevations with a small plan showing a pleasing and picturesque design for a small church built on sloping ground. The style is Gothic; various little points are got, probably suggested by the nature of the site; the vestry is projected as an octagonal bay, the height above the ground bringing its actual windows close under the eaves; a small square stair turret is a feature close to it. The elevations are merely lined in, and no attempt is made to give effect to them by "jointing" or shading. It would have been better if the main tower had not appeared to rise directly out of the roof, a defect in an otherwise pretty design.

1,734. "Design for the Campanile of the Cathedral of Zara, in Dalmatia;" Mr. T. G. Jackson.—A design for this—an unusual instance of a church tower being rebuilt in so out-of-the-way a position by an English architect—was exhibited two years ago, but has been modified, and this represents the tower as it will be carried out. The previous design was published in the *Builder* for May 25, 1889. The tower has been raised a story and the termination altered. The drawing is a remarkably fine specimen of architectural drawing in water-colour, clear and precise in detail while pictorially effective.

1,735. "Houses, Palace Court, Bayswater;" Messrs. Maclaren, Watson & Dunn. A pen-and-ink drawing of two houses, treated in the main as one square block, but very ingeniously diversified in treatment. In the left hand house a small projecting bay runs right up at the angle, from base to cornice, the doorway of this house forms a feature in the front wall of the block; in the right hand house a large bay is introduced on the ground floor only, and the entrance door is in a porch projecting from the

light hand of the building. What a contrast between this really picturesque and interesting bit of building and the regulation "semi-detached" house with its two doorways exactly repeating each other. This design deserved better than to be stuck at the top of the room. A plan is appended.

1,737. "Competitive design for club-room, Clapton;" Mr. Arnold Mitchell. As a bit of artistic drawing in monochrome this is one of the prettiest things in the room, but no plan is given and it can be judged as a picture only. The treatment of the side windows of what we suppose is the club-room, with the two high windows rising at intervals in two gables, is picturesque. The projecting gable in bright light at the right hand end of the composition is valuable from a painter's point of view; architecturally it seems rather an excrescence.

1,738. "The Croft, Stanstead Montpelier:" Mr. W. D. Caröl. Three pen and ink drawings in one frame of what we presume is a gentleman's house of some extent, but though picturesque, it impresses us as having picturesqueness without dignity, and looking more like a group of almshouses. The most effective feature in it is the solid semicircular bay in the right hand sketch, carrying a square half-timber gable corbelled out above it; but as no plan is given it is impossible to guess what suitability there may be in this and other details of the exterior treatment.

1,739. "Proposed East Window, Beaumont;" Mr. T. Grew. This is a pretty design, but looks more like fresco than stained-glass. The figures are delicately coloured in low tones, the background colour of the lights being red in the upper portions and green in the lower, while smaller lights above and below white angels and cherubs stand out from a blue background. This is naïve enough, and unless the background glass were very much broken up in tint would have a very crude effect. But it is impossible to guess from a drawing of this kind what the effect of a window will be.

1,740. "Part of the West Window, Fairford, Gloucestershire;" Miss Emma Knight. If we could recognise the existence of any rule or principle in the hanging of the architectural drawings we might suppose that this was purposely hung next to the last-named in order to afford a comparison between modern and ancient days of stained-glass. But we can hardly imagine the Hanging Committee equal to this; it must be a happy accident. The drawing is an admirable one, and gives very effectively the warm colour, multitudinous leading, and decorative style of the ancient window.

1,741. "Westwood Bickley entrance and garden front;" Mr. Ernest Newton. Two pen drawings by Mr. Raffles Davison of a pretty Tudor-old house. The naïve treatment of the two-storied bay window on the garden side with the eaves of the roof carried round it, is very peasant. The method of putting in other windows entirely out of centre and in a studiedly irregular manner is of course a kind of recognised method now of giving picturesqueness to a modern house; but it is a falsity, it is assuming a naïveté and simplicity of aim which is really foreign to the present day, and only artificially revived.

1,742. "40, Berkeley Square, Front Elevation;" Messrs. George & Peto. A front showing a good deal of French feeling in the architectural treatment. The two principal rows of windows are arranged within an *encadrement* of pilasters with a little cornice and basemould having rather the appearance of being pinned to the building, with blank wall left between the upper and lower range. The ground-floor windows are treated quite simply, with round arches and no ornament, and contrast well with the more ornate treatment of the other windows. But this apparent attachment of a pilaster ornamentation to the wall is not a very architectural way of producing effect. The balcony over the ground-floor windows is seated with a characteristic balustrade formed of fishes twisted in opposing curves; there is a rich and piquant effect in this. The gable rising above the eaves is ornamented by very fine consoles at the sides, with wide spaces between them and the walls, and looking more like wooden than stone detail. The general effect of the whole is refined and elegant.

CREMATION IN SWEDEN.—Last year twenty-seven persons were cremated in Stockholm,—viz., eighteen men and nine women. Of these, seventeen were members of the Swedish Cremation Association.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

ANNUAL REPORT.

THE annual general meeting of this institute was held on Monday evening last, Mr. Henry Currey, Vice-President, in the chair, to receive and consider the annual report of the Council, from which we extract the following passages:—

The Council, since the announcement of their election on the first Monday in June, 1890, have held twenty-four meetings. Committees of Council have also met for the consideration of matters connected with (1) the Alliance of non-Metropolitan Societies, (2) the Examination of Fellows under the third section of the Charter, (3) the proposed removal of Hanover Chapel, (4) a suggested increase of the classes of Hon. Fellows and Hon. Associates, (5) the maintenance and administration of the Library, (6) a suggested examination of operative masons, (7) the premises, alterations, (8) the award of the Royal Gold Medal, (9) the relations of the Institute and the Architectural Association, (10) the Institute finances, (11) the Berlin International Fine Art Exhibition, and also for (12) the consideration of matters under By-laws 22 and 23.

The premises of the Institute were closed from August 5 to September 6, 1890, during which the additions and alterations sanctioned at the last annual general meeting were carried out from the designs of the Honorary Secretary. In accordance with the resolution passed at that meeting a lease was taken, from the Architectural Union Company, of the shop and its basement at No. 9, Conduit-street, and a contract entered into with Messrs. Cubitt & Co. for the necessary alterations at a sum of 997*l*. The Council and secretarial staff are now accommodated on the ground floor, the Council-room being also used as the Secretary's office. In addition, various alterations have been made in the meeting-room and lavatories on the first floor, and also in the caretaker's rooms on the third floor; a rearrangement of the library is now in progress which, it is believed, will conduce to the convenience of members, and it is intended shortly to introduce the electric light. A cordial vote of thanks to Mr. Aston Webb for his work as honorary architect of the alterations and additions was passed by the Council at their first meeting in the new Council room.

During the official year now terminating 51 Fellows (of whom 22 were previously Associates) and 52 Associates have been elected. The number of Fellows is now 561 as against 519, and the number of Associates 785 as against 768, at the corresponding period last year. Three Hon. Associates,—Mr. Alexander S. Murray, LL.D., the Right Hon. Lord Savile, G.C.B., and Mr. William C. Alexander,—have been elected, and the number is now 72. One hon. corresponding member, — Professor Johannes Otzen of Berlin,—has been elected, and the number is now 47.

The losses by death, in the class of Fellows, since the issue of the last annual report, have been:—Thomas Searancke Archer, John Belcher, John Carrick (Glasgow), Walter George Coldwell, Richard A. Hill (St. Leonards), Robert William Mylne, F.R.S., and John D. Sedding; in the class of Associates:—Millward Butterfield and George Robson; in the class of Hon. Associates:—The Right Hon. G. A. F. Cavendish-Bentinck, M.P., the Very Rev. Dean Church, Sir William Hardman, Lord Magheramorne, K.C.B., and Sir Richard Wallace, Bart., K.C.B.; in the class of Hon. Corr. Members:—Don Rafael Contreras (Granada), Theophilos, Freiherr von Hansen (Vienna), Dr. Schliemann (Athens), and Friedrich, Freiherr von Schmidt (Vienna).

The premature death of Mr. Sedding, whose professional career was brilliant from its commencement, and who has left executed works of distinguished merit, has been the cause of deep regret to the Council and to many other members of the Institute personally acquainted with him, as well as to a large number who knew him only by his works. The death of Mr. Sedding was followed, on April 15, by that of his widow, with whose melancholy loss the Council had sincerely sympathised in a vote of condolence passed at their meeting on the previous Monday.

The Leeds and Yorkshire Architectural Society having applied to be admitted to alliance under the provisions of By-laws 77-81, and having consented to enforce the signing of "Declarations" by its members similar to those required from professional members of the Institute, the Council recommended the Society for alliance at the first special general meeting held this session, and their recommendation was approved. There are now eleven non-Metropolitan Societies allied to the Institute.

A Statutory Examination was held in October, to which six persons were admitted, of whom two passed. A Certificate of Competency to act as District Surveyor in London was granted to Mr. John Hudson, Associate; and a Certificate of Competency to act as Building Surveyor under Local Acts of Parliament to Mr. William Mortimer Paton.

Applications for admission to the newly-established progressive examinations have been received from all parts of the United Kingdom. In November, the third preliminary examination to qualify for registration as probationer was held in London, Glasgow, Bristol, and Manchester; in March, the fourth preliminary examination was held in London and Manchester. During the same periods the first and second intermediate examinations of probationers to qualify for registration as student were held in London; and two examinations to qualify for candidature as associate have also been held in London. Statistics of the examinations, in a tabular form, are here given:—

Preliminary Examinations.

Dates.	Admitted.	Not passed.	Relegated for periods	Passed and Registered.
Nov., '90	67 { 27 Exempted, 40 * Examined }	4	6	57
March, '91 ..	60 { 13 Exempted, 47 † Examined }	—	18	42
—	127	4	24	99

Intermediate Examinations.

Dates.	Probationers admitted.	Relegated for periods	Passed and Registered.
Nov., '90	8	2	6
March, '91 ..	13	2	11
—	21	4	17

Examinations in Architecture.

Dates.	Applied.	Admitted	Not passed.	Relegated.	Passed.
Nov., '90	43	42	4	13	25
March, '91 ..	63	60	6	30	24
—	106	102	10	43	49

The number of Probationers has now reached a total of 238, and there are 17 students,—constituted under the provisions of By-law 65,—whose names and addresses will be inserted in the next issue of the Kalendar.

During the official year (from May, 1890, to May, 1891), 49 gentlemen, out of 102 who were examined, have qualified for candidature as Associate, being five less than during the corresponding period 1889-90, when 54, out of the 93 who were examined, passed. During the Kalendar year 1890 the number who passed amounted to 51, amongst whom Mr. Erancis W. Bedford most highly distinguished himself; and the Council awarded him the Ashpitel Examination Prize.

It may be here useful to record that since March, 1882, the number of those who have qualified for candidature as Associate has reached a total of 385, including the passed candidates of March, 1891; and that for the last five years the Ashpitel Examination Prize has been annually awarded. Moreover, since the beginning of 1882, 354 qualified candidates have been elected Associates, in addition to whom the 24 who qualified this March are eligible for candidature.

The Royal Gold Medal for the promotion of architecture was presented, in June, to Mr. John Gibson, in recent years a Vice-President of the Institute. That for the current year is awarded to Sir Arthur Blomfield, A.R.A., Past Vice-President, and the award has been sanctioned by her Majesty the Queen.

The deed of award of studentships, medals, and prizes, made by the Council under the pro-

* 19 were examined in London, 4 in Glasgow, 1 in Bristol, and 16 in Manchester.
† 37 were examined in London, and 10 in Manchester

visions of by-law 66, was presented to the Institute in general meeting on January 12, and published at length in the *Journal of Proceedings* of January 22, 1891. . . .

The Competitions Committee have watched the advertisements of competitions, and corresponded with the promoters, recommending, with very considerable success, the appointment of professional assessors. The Committee have lately held several meetings to consider in what way the Institute "Paper of Suggestions" for the conduct of competitions can be improved, and the Council are informed that an amended form of that paper, prepared by the Committee, will shortly be submitted. . . . .

Early in the official year, the Council, at the request of the London United Building Trades' Committee, and of the London Trades' Council, received deputations* from both bodies. The former asked that the practice of sub-contracting in the building trades might have the careful consideration of architects, and submitted the following propositions:—1. That the contractor shall not be allowed to sub-let any portion of his contract; (2) that all labour shall be of the best quality; and (3) that the contractor shall pay not less than the recognised or trades-union rate of wages, and shall observe all recognised rules and customs as to working hours. The latter deputation asked that the fourth Clause of the Heads of Conditions of Contract, published by the Institute, viz, that "the contractors are not to sub-let the works, or any part thereof, without the consent in writing of the architect."—might be made compulsory instead of permissive as at present.

At the request of the First Commissioner of Works and Public Buildings, the Council nominated a certain number of architects to be invited by him to take part in a limited competition for the completion of the South Kensington Museum, the First Commissioner having first selected four architects, whose names he gave. The Council, after a ballot by voting papers of all their members, nominated Mr. T. G. Jackson, M.A, Mr. R. Norman Shaw, R.A., Mr. W. Emerson, Member of Council, and Mr. J. Belcher, Member of Council. As Mr. Shaw declined the invitation, they nominated Mr Bodley, A.R.A, to take his place; the latter having also declined, the First Commissioner nominated Mr. William Young, Fellow. The four architects invited by the First Commissioner were Mr. Macvicar Anderson, Vice-President, Mr. T. E. Collcutt, Member of Council, Sir T. N. Deane, R.H.A., and Mr. Aston Webb, Hon. Secretary; Mr. Anderson, however, having asked to be excused, Mr. Mervyn Macartney, Fellow, was substituted by the First Commissioner. The President would have been invited by the Government had he not preferred to stand aside, and he has since accepted the duties of professional adviser to the judges appointed to decide on the respective merits of the designs.

The Council, having been asked to nominate a delegate to the International Congress of Hygiene and Demography, which is to be held in London during the month of August, appointed Mr. P. Gordon Smith, Fellow, the Architect to the Local Government Board, to act in that capacity; and he has been good enough to do so. The Council are glad to find that the programme of the sixth section of the Congress, —"Architecture in Relation to Hygiene,"—embrace a variety of subjects, the consideration of which cannot fail to be of the utmost value both to architects and the public. Acting on the suggestion of the executive officers of this section, the Council invited the foreign corresponding members of the Institute to assist in the deliberations of the Congress; and many of them, in reply, have sent most gratifying assurances of co-operation and support.

The Bill for the Registration of Architects introduced into the House of Commons early in the Parliamentary session by Mr. Wilson Noble, M.P., differs but slightly from that of the previous session. The petition against it, prepared by the Council on behalf of the Institute, was presented on February 20, 1891, by Mr. Dixon-Hartland, M.P., who has given notice of his intention, should the Bill come on for second reading, to move its rejection; while Mr. Kimber, M.P., Sir Edmund Lechmere, M.P., and Mr. Da Lisle, M.P., have each given a similar notice. Since then a memorial, signed by seventy gentlemen, forty-six of whom are architects, has been submitted to the Council, recording their opinion that the attempt to make architecture a close profession, either by the Bill now in Parliament or by any similar measure, is opposed to the interest of architecture as a fine art; that students' artistic qualifications cannot be tested by examination, and that a diploma obtained by such means would be a fallacious distinction; that, moreover, examinations and diplomas would alienate still further the sister arts of painting and sculpture from architecture; that no legislation can protect the public against bad design, and that it cannot prevent bad construction unless builders and all those who erect buildings are required to pass the test of examination as well as architects. The Council, having considered the terms of the memorial, offered to meet the memorialists in conference, but their reply appeared to render futile any discussion such as was proposed, and the Council could only express regret at its tenour.

The publication of the Memorial in *The Times* having been preceded by a letter signed by six of the memorialists, in which they stated that it was no secret that some of those who now join in opposing the Architects' Registration Bill, were doing so in the hope of substituting another measure of their own, the Secretaries were directed to write to *The Times* stating that the assertion as far as the Council were concerned was absolutely without foundation; and some of the signatories to the former letter having stated their grounds for that assertion, their communication was published in the *Journal of Proceedings*.

Adverting to the last Annual Report, in a paragraph respecting correspondence with the London County Council, on the subject of their General Powers Bill then under consideration, the Council of the Institute have to report that though the Bill passed the House of Commons amended in many particulars substantially in accordance with the suggestions submitted by them, an important exception occurred in the clause relating to return frontages of corner sites, which clause passed the Lower House unopposed. The Council consequently lodged a petition to the House of Lords against that clause, and the Institute was represented before the Lords Committee by Mr. Arthur Cates, Vice-President, whose claim to be heard thereon was admitted. As a result the objectionable clause was modified and a right of appeal against its provisions to the new Tribunal was inserted, while alterations were made in other clauses of the Bill. Great assistance was rendered to Mr. Cates, when before the Select Committee, by Mr. E. T. Hall, Fellow, who gave valuable evidence, and whose plans and diagrams, explaining the character of the clause in question, proved of essential service.

By the 28th section of this Act,—the London Council (General Powers) Act, 1890,—a tribunal of appeal has been constituted, consisting of one member appointed from time to time by the London County Council, one by the Council of the Institute, and one by the Council of the Surveyors' Institution. The first appeal, being one against a decision of the Superintending Architect, having been made by the owner of certain buildings at Islington, the Council appointed Mr. Arthur Cates on their behalf as member of this Appellate Tribunal; and on the further application of the County Council, Mr. Cates has been requested to act for a fixed period of one year.

The Practice Standing Committee, whose Chairman is Mr. Henry Currey, and whose Vice-Chairman is Mr. Cates, with Mr. Rickman, F.S.A., Associate, and Mr. E. T. Hall, Fellow, as hon. secretaries, report that they have held six meetings, but that there have been weekly sittings by a Sub-Committee through the greater part of the year to consider the amendments and codifications of the various Building Acts affecting the metropolis. Substantial progress has been made in this arduous task. The Committee have reported to the Council on the following subjects:—1. On the form of advertisement for tenders adopted by H.M. Office of Works and Public Buildings. 2. On the subject of ownership of drawings. 3. On a proposed patent for plans of public buildings. 4. On the subject of sky-sign legislation. 5. On the proposed by-laws made by the London County Council under section 31 of the London Council (General Powers) Act, 1890, and section 16 of the Metropolis Management and Building Acts Amendment Act, 1878.

As regards (1) the question of responsibility for quantities, the Council addressed a let to the Secretary of Her Majesty's Office Works on the subject of a clause in the fo of advertisement for tenders used by th department, viz.:—that "the Commission do not hold themselves responsible for t accuracy of the quantities [supplied by t department] which must be verified by t persons desirous of tendering;" and receiv a reply that the words "which must be verif by the persons desirous of tendering" would omitted in future in such advertisements. The Council took the subject of the ownersh of drawings into consideration, but the Pre dents of allied societies (members of t Council) having made communications there it was found desirable to postpone for t present any definite action in the matter. The proposal to patent a plan for arrangi public buildings would have been opposed the Council had the power to do so existed, a they expressed an opinion in a letter to Mess Flockton & Gibbs that the course taken v inimical to the interests of the professi and likely to bring them into seri conflict with other architects, to which t replied in a most kindly spirit. (4) letter was received from the Buildi Act Committee of the London County Cou asking for an opinion respecting a memorand on sky-signs, and the Council replied in terms of the report of the Practice Stand Committee; they were further asked to appo some one to represent their views on London Sky-Signs Bill before a Committe the House of Commons. Mr. Cates hav kindly consented to act on their beh attended before the Committee and g evidence representative of the views of Council, in support of the Bill; and the having passed successfully through Commit a vote of thanks to him was recorded in Minutes. As regards (5) the draft By-l made by the London County Council, s gestions for certain amendments have b forwarded to the Home Secretary, in acco ance with the provisions of the Act of 1 and a copy of the same to the London Cou Council.

The Art Standing Committee have h eleven meetings, and at the first they appoin Mr. John D. Sedding, Chairman, Mr. R. Carpenter, F.S.A, Vice-Chairman, Mr. Ra Nevill, F.S.A., Fellow, and Mr. Beresford P Associate, Hon. Secretaries. In addition minor matters, the Committee have rec mended the Council to take action on following subjects:—1. The preservation of monuments of Ancient Egypt. 2. alteration of the Banqueting House, Wh hall, consequent on the loan of the buildin the Royal United Service Institution for purposes of a museum. 3. The Hanover Cha Removal Bill,—a private Bill introduced i the House of Lords. The Committee ca attention to the injury that would be done the appearance of Regent-street by the posed demolition of the church, and the re with which they would view the loss of so a work by the late Professor Cockerell. 4. proposed demolition of St. Mildred's, Bre street. The Committee hoped that s means had been found to preserve one Sir Christopher Wren's churches, but tha it must be destroyed, the plaster decora and other objects of interest in the inte should at least be retained in some muse 5. The draft of new "Requirements Suggestions" prepared by the Incorpora Society for promoting the enlargement, bu ing, and repairing of churches and chapels.

After careful consideration of the ab recommendations, the Council and several o members of the Institute (1) memorialised Marquis of Salisbury, as Secretary of State Foreign Affairs, praying that his lordship wo move the Egyptian Government to app competent official inspectors, who would instructed to submit, with a view to publicat yearly reports of their proceedings; and i understood that two European Inspectors h been appointed. (2) The Council forward memorial to the Marquis of Salisbury, exp sing an earnest hope that no structural alt tions, internally or externally, might be mitted to mar the beauty of the Banque House as a great work of architecture; they have since received a letter from the Commissioner of Her Majesty's Works Public Buildings stating that it will be his to see that in the alterations which ma necessary to prepare the Banqueting House

* Fully reported in the *Builder* for June 28, 1890, pp. 468-470.

the purposes of the Royal United Service Institution, there shall be no material interference with the architecture of the structure, either in the interior or the exterior, and that the fine ceiling by Rubens shall be specially and carefully maintained. (3) The Council lodged a petition to the House of Lords against the Hanover Chapel Removal Bill, and they have decided to petition the House of Commons against the Bill as soon as it is introduced there. (4) The Council addressed a letter to the Bishop of London respecting the proposed demolition of St. Mildred's, and received a reply that his Lordship was unable to preserve all Sir Christopher Wren's churches. (5) The Council forwarded to the Society the recommendations of the Art Committee respecting the new "Requirements and Suggestions" of the Incorporated Church Building Society, with an intimation that the recommendations were sent as submitted by the Committee, and with the hope that they might be of use to the Society.

The Art Standing Committee have further, with the approval of the Council, begun a series of general meetings for the discussion and practical exemplification of the decorative arts. The first was held on December 15, 1890, when Plaster-work was taken as the subject. Papers were read by Mr. Edward S. Prior, M.A., Fellow; Mr. G. T. Robinson, F.S.A., and Mr. Stephen Webb; a practical illustration of hand-modelled plaster decoration on ceilings was given by Messrs. Whitcombe and Priestley, and of *Sgraffito* by Mr. Heywood Sumner, who also delivered an address on the subject. A second meeting was held on April 20, 1891, when papers on the subject of Decorative Painting, by Mr. J. M. Brydon, Member of Council, Mr. W. B. Richmond, A.R.A., Mr. N. H. J. Westlake, F.S.A., and Mr. Ford Madox Brown, were read.

The Committee have expressed the deep regret they feel at the death of their Chairman, Mr. J. D. Sedding, and their sense of the great loss to the Institute and themselves of his energy and enthusiasm.

The Science Standing Committee, whose Chairman is Mr. Lewis Angell, Fellow, and whose Vice-Chairman is Mr. Henry Dawson, Fellow, with Mr. Lovegrove, Associate, and Mr. William C. Street, Associate, as Hon. Secretaries, have held seven meetings. The Committee have had under consideration the subject of new materials and inventions, and they are of opinion that it would not be advisable for the Institute to endorse the character of materials or building commodities, as this might be made use of for advertising purposes; but if anything is brought before them of great excellence or utility, they will cause a notice of the same to be prepared and submitted for publication in the *Journal of Proceedings*. The Committee have considered the proposed "Requirements and Suggestions" of the Incorporated Society for Church Building, and the question of Sanitary Registration of Buildings; and as regards the latter, they are of opinion that it is not opportune to ask the Government to introduce the subject into the Bills now before Parliament.

The Council forwarded to the Incorporated Church Building Society the recommendations of the Science Standing Committee respecting the new "Requirements and Suggestions" of the Society as submitted by the Committee. The Council regret that extreme pressure of business has prevented their consideration of the Committee's Report on "Light and Air," as well as of other matters which have been similarly brought up and postponed.

The Literature Standing Committee report that they have held nine meetings during the official year, with an average attendance of ten members, and at their first meeting they elected as chairman Mr. Graham, F.S.A., Member of Council, and as hon. secretary, Mr. Paul Waterhouse, M.A., Associate. The Committee thought it desirable, for the convenience of members, that a syllabus of the papers to be read during the current session should be published as early as possible, and a provisional list was accordingly prepared and issued for the greater portion of the meetings.

Several recommendations made by the Committee in respect to the *Journal of Proceedings* were adopted by the Council. . . . .

The Library Management Committee have held eight meetings, at the first of which Mr. Hansard, member of Council, was appointed chairman, the librarian—Mr. Beazeley—acting as secretary. The statistics which follow indicate the accessions to the reference library and loan collection of books, since the issue of the last annual report.

During the twelve months elapsed from April 1, 1890, to March 31 of the present year, the additions to the library amounted to 170 volumes and 172 pamphlets, and to the loan collection, 13 volumes and 14 pamphlets, exclusive of Parliamentary papers, periodicals, reports, and transactions of societies, parts of works issued in a serial form not yet completed, and tradelists. . . . .

The attendances of readers in the Library numbered 2,914, representing (allowance being made for the time the Institute was closed for structural alterations) an increase of more than 6½ per cent. upon the total (3,039) of the preceding twelve months.

The number of tickets (exclusive of renewals) issued for admission to the use of the Library and Loan Collection was 91 (last year, 94).

The number of volumes issued on loan was 945, which (allowing as above) represents an increase of more than 6¾ per cent. upon the total (985) of the preceding twelve months. . . . .

The attendances of members of the Architectural Association as readers in the Library were 304 (last year, 296), and the number of issues on loan (both these items being included in the gross returns above given) was 117 (last year, 91).

The attention of the Library Management Committee having been called by the Council, acting on the recommendations of a Special Committee appointed by them for the purpose, to certain changes involved, under By-law 41, in the administration of the Library, the Committee drew up revised regulations for its future management, which, after a few amendments, were approved by the Council. . . . .

The close of Mr. Waterhouse's term of office, prolonged as it has been by the general desire of the Institute, affords the Council an opportunity of giving public expression to their sense of his great and arduous services. Since the death of Mr. I'Anson in January, 1888, the administration of its affairs, to the infinite advantage of the general body of members, has been in the hands of Mr. Waterhouse, although he was not elected to the Presidentship until May of that year; and if this exceptionally long period has been one of uninterrupted progress and prosperity to the Institute, it is largely due to his energy, firmness, and conciliatory manner. Indeed, the Council desire to express the sincere satisfaction they have always experienced while working under him, and the unfeigned regret with which they lose his guidance as President.

The revenue account of ordinary funds is submitted with the report, duly audited and signed by the auditors, Mr. Kidner, Fellow, and Mr. Woodward, Associate. The total income for the year ended December 31, 1890, was 4,883*l*. 14s. 8d., and the estimated income for the current year is about 5,000*l*.

The report was adopted.

COMPETITIONS.

STOKE NEWINGTON PUBLIC LIBRARY.—We are officially informed that the Library Commissioners have selected the design marked "Spes," by Messrs. Bridgman & Goss, and that they have awarded a premium of 10*l*. 10s. to that marked "Lux," by Mr. Sidney Smith.

DEAF AND DUMB INSTITUTE, PRESTON.—On Monday last the Building Committee of the Cross Deaf and Dumb Institute to be erected at Preston for the deaf and dumb of North and North-east Lancashire met to decide on the merits of the plans that had been sent in for the building. Eight sets of plans had been sent in, and from these three were chosen for final inspection on Monday, when those forwarded by Messrs. Sumes & Green, of Blackburn, were adopted. A premium of 20*l*. was awarded by the Committee to Messrs. Wolstenholme & Briggs, of Blackburn, and one of 10*l*. to Messrs. Sheppeard & Gilbertson, of Preston.

FREEDOM OF THE PLUMBERS' COMPANY TO AN OPERATIVE PLUMBER.—At the last Quarterly Court of the Worshipful Company of Plumbers, held at the Guildhall, London, Mr. H. C. Leat, operative plumber, of Bristol, was admitted to the Freedom of the Company by reason of his having passed the prescribed examinations in the practical and theoretical branches of plumbing in the Honours Grade

THE ROYAL SOCIETY'S SOIREE.

A DISTINGUISHED company assembled in the apartments of the Royal Society, Burlington House, on Wednesday evening last, on the occasion of the annual soirée. As usual, a large number of scientific novelties and inventions were exhibited, electrical appliances especially being very well represented. None of these claimed a greater share of attention than the exhibits of Mr. Shelford Bidwell, M.A., F.R.S., which consisted in selenium cells, the electrial conductivity of which is greater in the light than in the dark; a selenium lamp-lighter, which lights an incandescent lamp automatically when darkness comes on; and a selenium alarm, for calling attention to the accidental extinction of a ship's light, or railway signal lamp. It may be noted that it is found advantageous to arrange the selenium so that it may expose a large surface relatively to its volume, the electrodes at the same time being large and near together. Several contrivances, known as "selenium cells," have been proposed, in which these conditions are more or less perfectly fulfilled. In the cells exhibited by Mr. Bidwell two fine copper wires, serving as electrodes, are wound very close together upon a slip of mica, one side of which is afterwards coated with a thin film of selenium. A small electric current passing through such a cell is varied by the action of light sufficiently to enable it to work a delicate relay, by means of which a bell may be rung, or an incandescent lamp turned on. To show the sensitiveness of the apparatus, the exhibitor several times crossed between a strong light and the cell, and by the mere action of thus cutting off the light for a second, an electric bell was rung.

Messrs. J. E. H. Gordon & Co. exhibited a Tomlinson regulator for electric-light mains, intended especially for use in transformer substations. In action it is worked by a wire from the central station, but automatically corrects any error of the attendant at the central station. The exhibitors stated that the ordinary automatic apparatus cannot be safely used for this purpose; as though should such get out of order when taking out transformers, no harm is done except the waste of coal, yet, if it gets out of order when putting in transformers, it may burn up the sub-station. The peculiarity of the new apparatus is that, if anything whatever goes wrong, all transformers are at once put in, thus ensuring absolute safety; whilst it is very economical in that it saves a considerable quantity of coal.

Mr. J. Wimshurst showed an electrical influence machine, which was both alternating and experimental; and Mr. R. E. Crompton, M.Inst.C.E., a section of armature winding, showing copper divided, twisted, and compressed, to avoid loss from eddy currents, which is similar in construction to the new London-Paris telephone wire. Mr. Crompton also exhibited his method of obtaining, accurately, sub-multiples of the ohm, for current-measuring purposes. A revolving mirror, by Prof. Oliver Lodge, D.Sc., F.R.S., proved of great interest. This mirror, which is driven by clockwork, revolves very rapidly, having a detachable fan to give moderate speeds, with adjustable mainspring to vary the speed, and with vacuum cover for highest speeds. (The last is not so satisfactory as might be.) There is a slow-moving index to enable the speed to be determined, and an electro-magnetic brake to regulate its going, or to stop it gradually. The mirror makes 5,760 revolutions for 1 of the winding arbor.

An electrical safety-valve, and exhausted bulbs, used to ascertain the space traversed by high tension alternating currents, were exhibited by Mr. Killingworth Hedges, M. Inst. C.E., whilst Mr. W. Crookes, F.R.S., had a splendid show of apparatus dealing with electricity and high vacua. With respect to this latter, it was demonstrated that diamonds subjected to the molecular stream phosphoresce in different colours according to their origin. Thus, Cape diamonds usually phosphoresce blue; Brazilian, red, orange, blue, and yellow; and Australian, yellow, blue, and green. This is a discovery which will prove useful to experts in gems. Zinc sulphide (Sidot's hexagonal blende) is the most brilliantly phosphorescent body yet met with. Professor A. Schuster, F.R.S., exhibited some forms of Clark cells, provided with valves to prevent their destruction by evolution of hydrogen, which is otherwise fatal to cells which are sealed hermetically.

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Special attention was given to the map by Profs. Rücker and Thorpe, F.R.S., showing the probable connexion of lines towards which the magnet is attracted in England and France. These observers found that the north pole of a magnet is attracted to a line which runs south from Reading, and enters the English Channel near Chichester. M. Moureaux has traced a similar line from Fécamp to the south of Paris, but its southern termination has not yet been discovered. The directions of the two lines make it probable that they are parts of the same axis of disturbance. We may also mention that Profs. Rücker and Thorpe have demonstrated the existence of another magnetic line commencing at Dover, and running near London to Reading, Bristol, and through South Wales; and they have pointed out that this line approximately corresponds in direction to the theoretical position of a ridge of palæozoic rocks running from the Somersetshire coalfield through the south of England to the Boulonnais. The importance of this observation is that it is independent testimony of the correctness of the geological hypothesis referred to; and, inasmuch as this ridge of ancient rocks in the ordinary course of events should have coal-measures associated therewith, this magnetic observation will be of practical utility in indicating sites for experimental bore-holes.

Mr. A. P. Trotter exhibited his curve ranger, which is a portable instrument intended to facilitate the setting out of large curves for railway and other work. It dispenses with tables of angles and with the use of chains and assistants. No cumulative error can arise as with theodolite work. A considerable number of elements of the curve and the angles connected with it may be found directly from the scales on the instrument. M. M. Richard Frères had a large number of self- recording instruments; and Prof. Silvanus P. Thompson, D.Sc., a "focometer,"—an instrument for determining the position of the two principal "focal planes," and of the two "principal planes" of Gauss, for any compound system of lenses. Prof. Roberts-Austen, C.B., F.R.S., exhibited a method of recording pyrometric measurements at temperatures between 600°C and 1,200°C. The apparatus was that employed in a research undertaken for the Institution of Mechanical Engineers, and used for automatically recording, by the aid of photography, the indications of a platinum and platinum-rhodium thermo-couple. The experiments shown illustrated a method of recording the rate of cooling of heated masses of metal. Curves were on view illustrating the kind of results obtained by the aid of the apparatus. Prof. W. C. Unwin, F.R.S., sent a length-measuring instrument; Prof. J. A. Ewing, F.R.S., showed a model of a Japanese earthquake by Prof. Sekiza, and Mr. Allan Dick a new form of polarizing microscope.

The extremely interesting series of iron tools and utensils of the Roman period, found together in a pit in the Romano-British city at Silchester, in September last, were exhibited by the executive committee of the Silchester Excavation Fund (by permission of the Duke of Wellington).

Many drawings and photographs were on view, the Council-room having its walls decorated with a fine collection of views in the Royal Gardens, Kew, illustrating the development of the Gardens during the last fifty years. This series is a portion of a very extensive and valuable collection of prints, drawings, and photographs of the most interesting features in the Gardens; and has taken twenty years to bring together. Photographs of the spectrum and other phenomena were shown, as well as a few microscopic objects and appliances. At ten o'clock a series of meteorological photographs of clouds, and of the effects of hoar frost, were shown on the screen from a lantern by Mr. Clayden. Speaking generally, the exhibits were of a high order, fully maintaining the interest of previous years; whilst they were fairly representative of the most recent scientific discoveries, all contributing to make the conversazione a thorough success.

WIRE GAUGES.—We have received from Messrs. W. F. Denis & Co. a table giving the sizes, in millimètres and decimals of an inch, of the various standard wire gauges used in different countries, compared with the Imperial standard wire gauge. A few useful data for calculations are added. The tables are printed on stiff varnished card, for hanging up.

Illustrations.

PEOPLE'S PALACE, EAST LONDON.

WE give this week a view of the south front of the People's Palace, facing the Mile-end-road, as now completed. It is the gift of the worshipful Drapers' Company, and has been executed at a cost of about 15,000*l*. Our readers will remember that the central hall was the first portion of the building erected, and its rough, brick southern end has been masked in stone in the manner shown in the drawing. The outer portion, or south front, contains, on the ground-floor, grand entrance to the hall, staircases, &c.; first-floor, rooms in connexion with technical teaching; while the upper floor is devoted to the art school.

The architect endeavours to give expression to the uses of the building as a hall of assembly, and also as a school for the encouragement of art and science. The *motif* is somewhat the same as that of the Royal Institute of Painters in Water Colours, Piccadilly, but is carried further, and, having a southerly aspect, has the great advantage of being seen in sunlight, which is not so in the other case.

On the left of the drawing is shown a part of the "Winter Garden," which has been erected at the cost of Lord Iveagh (Sir Edward Guinness) for the sum of about 14,000*l*. E. R. R.

MOSAIC FROM SAN VITALE, RAVENNA.

THIS illustration is a monochrome reproduction from an elaborate coloured drawing by Professor Aitchison, now hung in the Architectural Room at the Royal Academy. It does not therefore show the colour of the original, but reproduces the beautiful and historically interesting design in which the Classic reminiscences of Greek scroll-work are combined with the Byzantine fancy of animals leaping through them, and with the curiously naturalistic floral designs in the cross ribs dividing the main compartments of the design. The globes and rather stiff figures of angels standing upon them again illustrate the entry of the figures of the Mediæval world amid the enrichments of the antique world.

MONTPELLIER BATHS, HARROGATE.

THIS building is about to be erected by the Corporation of Harrogate to take the place of an older and much smaller one. The whole of the bathing accommodation is on one floor, and includes, besides some sixty dressing-rooms and thirty bath-rooms, a Turkish bath, and rooms for inhaling the waters, and for treatment by massage. The basement is chiefly occupied by the laundry and other machinery, boilers, &c., with accommodation for the attendants. Attached to the building, on the south side, are a winter garden and a pump-room. The walls are to be faced, as far as possible, with stone from neighbouring quarries. The architects are Messrs. Frank Baggallay and F. E. Bristowe. The perspective view represents the design as it is to be executed. The design as sent in at the time of competition we have already published.

TULLIE HOUSE, CARLISLE.

THE drawings of this old house in Carlisle, furnished to us by Mr. C. J. Ferguson, the well-known architect, represent the scheme which he devised for adapting the house for a free museum, library, art gallery and school of art for Carlisle. The house dates from the end of the seventeenth century (1685). Mr. Ferguson's great wish was to preserve the old staircase, the floor of which has had to be renewed, but the whole of the newels, balusters, and capping, of English oak, he states to be as sound and good as the day they were first put in; an alternative scheme by the Borough Surveyor proposed the removal of this staircase. At a public meeting held two or three weeks ago in Carlisle Town-hall a resolution was passed to request the Corporation to provide for the preservation of the ancient staircase in any plans that might be made for the alteration of the house; which we hope will be done. A fine old staircase seems to have a special claim to respect when the building containing it is to be used as an art museum.

THE ROYAL NAVAL EXHIBITION, CHELSEA.—This interesting exhibition was opened on Saturday last by the Prince of Wales. We have no space to say anything about it this week.

THE ARCHITECTURAL ASSOCIATION VISITS:

THE NEW WEIGH-HOUSE CHAPEL.

THE sixth sessional visit of the Association took place on the afternoon of Saturday, April 25, and was attended by a large number of members, who were attracted by the opportunity of inspecting the new Weigh-house Chapel, schools and minister's residence, now approaching completion from the designs of Mr. Alfred Waterhouse, R.A. The buildings are in Duke-street, Mayfair, and are surrounded on three sides by streets.

It will be remembered that the original Weigh-house Chapel, situated in the City, was bought and demolished by the Metropolitan Railway Company, and the disposal of the large sum derived from the sale of this property has been under consideration for some considerable time. It was finally decided to amalgamate with the Robert-street Congregational Chapel, the lease of which was about to expire, and on the new site in Duke-street,—a donation, it is understood, from the Duke of Westminster,—the present accommodation has been provided, which will certainly be the best building that the Congregationalists will possess.

The buildings comprise a chapel, with gymnasium and club-rooms underneath, at the corner of Duke and Robert streets. At the north-east corner, facing Thomas-street, an attached building contains class-rooms, meeting-rooms, school-rooms, lecture-rooms, and caretaker's residence. In the same street, and adjoining but not connected in any way, is placed the minister's residence, which is little short of a mansion in its comforts, convenience, and accommodation. Mr. Waterhouse has used in this building the style, with Romanesque characteristics, which has been made so familiar in his Natural History Museum and his Congregational Chapel at Hampstead. The material used are terra-cotta and Whitwick red brick. The entrance to the chapel is in the centre of the Duke-street front, and is flanked on either side by two towers, which contain staircases leading down to the basement and up to the gallery. The plan of the chapel, which is rectangular on the ground floor, above the level of the gallery becomes elliptical, and in that form is continued to the eaves and so into the roof. That portion of the walls which comes within the rectangle at the corners, is supported on arches springing from a central pier which is carried down through the basement. The piers are constructed of steel cased in concrete, and faced with Burmantoft faïence. The gallery front naturally follows the elliptical form of the walls. Glazed bricks and Burmantoft faïence have been largely used on the walls of the interior. The ceiling also assumes an elliptical form, and it consists of plaster panels and wood ribs. This is a false ceiling, and is suspended from a semi-elliptical lattice of iron or steel ribs, which also support the external roof-covering. The contractors for the work are Messrs. Shillitoe.

We gave a double-page view of the building in our issue for January 18, 1890.

THE INSTITUTE OF BUILDERS:

ANNUAL DINNER.

THE annual dinner of the Institute of Builders was held at the Grand Hotel, Trafalgar-square, on Thursday, the 30th ult., the President (Mr. Henry Thomas Ashby) being in the chair. Among those present were the President of the Surveyors' Institution and Messrs. Thomas Blashill, Stanley G. Bird, George Burt, J.P., Howard Colls, T. F. Franklin, E. S. Henshaw, Mark King, Leonard J. Maton, Frank May, J.P., Robert Neill, jun., T. M. Rickman, T. H. Rider, W. Shepherd, J. Sheppard, H. J. Treacher, and William H. White.

The President having proposed the toasts of "The Queen," "The Prince and Princess of Wales and the other Members of the Royal Family," Mr. Woodman Hill proposed the "Navy, Army, and Auxiliary Forces," which was responded to by Colonel Stanley G. Bird.

In the course of his speech in proposing the toast of "The Institute of Builders," the President said that the functions of the Institute did not extend to the wages question, but all questions relating to the professions—matters of contract, methods of procedure, and all things of a like character—came within its scope. The Institute sought to do its work in



THE MONTPELLIER BATHS, HARROGATE: PI



W.—Messrs. Baggallay & Bristowe, Architects.



SAN VITALE, RAVENNA: MOSAIC OF SANCTU

No. 1839, Royal Academy Exhibition, 1891.



T.—From a Drawing by Professor Aitchison, A.R.A.

most friendly spirit; never to oppose for the e sake of opposition, but to carefully weigh ry question, so far as it was possible, in an artial and receptive spirit. The keynote of olicy was to uphold with all its might the d and friendly feelings that had hitherto ted between the architects and the ders, and to combat with all its energy rything that was likely to interfere n that most desirable condition of ngs, being convinced that the best interests the clients, who employed both architect builder, were most efficiently served en each worked in a spirit of mutual respect l confidence and harmonious co-operation. do its work properly, the Institute must be ong; it should learn the lesson taught by t great soldier, Moltke, just dead, viz., to anise in peace, so as to be prepared for war. e Institute was doing that. The chairman n went on to speak of various matters which l engaged the attention of the Council of Institute during the past year, including proposed new Conditions of Contract which e submitted to them by the Practice Comttee of the Royal Institute of British hitects. It had also given its attention to dry Bills before Parliament; while the ithful energy of the London County Council l set some problems for solution by the titute, especially in regard to the new BuildBy-laws and regulations. But there was ier work needing attention, such as the ponsibility of quantity surveyors, and many er difficult questions of great importance to the erests of the trade. There was also another matto which he must make reference. Amid the tual respect and friendship existing between hitects and builders, they could not but ognise the tendency, in a small but energetic tion of architects, to exalt the profession at e expense of the trade,—to constitute the rmer a sort of high-caste Brahminism, the ests of which were infallible, unquestionle, and in whom dwelt all power and initiative, breby relegating the builders more and more o the position of mere hewers of wood and awers of water. In that tendency there was eat danger to all that was good and honourle in the traditions of the building trade. r these and other reasons he called upon the de to strengthen the Institute more and re.

The toast was very heartily received.

The "Architects and Surveyors" having been posed by Mr. W. Shepherd, was replied to Mr. Thomas Blashill, Architect to the ndon County Council, and Mr. R. C. Driver, esident of the Surveyors' Institution.

The next toasts of the "President," the ast Presidents," and the "Visitors," having en respectively proposed by Mr. John M. rt, Mr. Wm. Scrivener, and Mr. George Burt, re responded to respectively by Mr. Thomas bby, Mr. T. F. Rider, and Mr. T. F. Franklin.

ARCHITECTURAL SOCIETIES.

Leeds and Yorkshire Architectural Society.—The annual general meeting of this ciety was held on the 27th ult. at the Law stitute, Albion-place, Leeds, the business ing the consideration of the report for the ar, and the election of officers. Mr. J. H. eaves, one of the hon. secretaries, submitted e report, which shewed that during the past elve months the institution has increased in efulness and come more into touch with the ntral organisation, the Royal Institute of itish Architects. The name of Mr. F. W. dford, who gained the Ashpitel prize and the ven Jones Travelling Studentship, has been ded to the list of junior members of the ciety. The Council have at present under nsideration, in conjunction with the R.I.B.A., scheme for the further education of the sociates by forming classes at the Yorkshire llege, and it is hoped that these will be comnced in the autumn. It is intended by e Council to go into the Leeds Improveent Bill, more particularly with a view the consideration of clauses which may found to adversely affect the architectural ofession. The members of the society number 2, including 41 honorary, 51 ordinary, and 30 sociates. The prize of 5*l.* 5s., offered by the esident, and the Society's medal, was awarded Mr. W. P. Peters, for his measured drawing the King's Manor House, York. The report as adopted, and the officers for the ensuing ar were afterwards appointed. Mr. W. H. orp was re-elected President; Mr. G. B. Bulmer and Mr. C. H. Thornton were appointed vice-presidents; Messrs. George Corson, E. Birchall, J. B. Fraser, C. R. Chorley, and H. Perkin form the list of past presidents; Mr. W. Hobson was chosen treasurer, and Mr. W. J. Mettam, librarian; Messrs. J. H. Greaves and H. C. Hall were reappointed secretaries; Messrs. Musto and C. C. Chadwick auditors; and the following were elected members of the Council: Messrs. Beevers, Butler-Wilson, Buckley, Danby, and E. J. Dodgshun. Mr. Thorp and Mr. Bulmer were appointed to represent the Society on the deputation which is to wait upon the Postmaster-General with reference to the alteration of the elevation of the Leeds new post-office.

Liverpool Architectural Society.—The annual general meeting of this society was held on Monday last at the Royal Institution, Colquitt-street, Mr. T. Mellard Reade, President, in the chair. The report showed that 120 members were on the books, as against 126 last year. The Council were negotiating with the authorities of University College as to an arrangement for evening classes to assist the students with their work for the various examinations of the Institute. The treasurer's account showed a balance in hand of 44*l.* 7s. 11d. on general account, and 9*l.* 6s. 4½d. on library account. The following gentlemen were elected officers for the ensuing year:—President, Mr. T. Harnett Harrisson; Vice-presidents, Messrs. A. Culshaw and H. Hartley; Treasurer, Mr. James Dod; Secretary, Mr. Henry L. Beckwith; Fellows, Messrs. T. Cook, A. Culshaw, G. E. Grayson, J. M. Hay, H. Hartley, W. Parslow, and T. Mellard Reade; Associates, Messrs. J. A. Berrington and H. W. Keef.—The President, in his closing address, the subject chosen for which was "Art and Structure," maintained (according to the brief report which is given in the *Liverpool Daily Post*) that structure should come first, and beauty afterwards. Beauty in architecture should be the outgrowth of structure, and such it could never be if the artistic side was to be considered separately from the structure. He greatly feared that the cry of architecture being an art, and therefore independent of ordinary rules, was a wrong or a backward step.

Edinburgh Architectural Association.—Mr. John M'Lachlan read a paper before the members of the Edinburgh Architectural Association on the 30th ult. on "Old Edinburgh," in the course of which he dealt with the various changes which have taken place in the city in respect of its extensions, its remodellings, and its rearrangements. He described the boundary of the city in 1450, the Flodden wall of 1513, and its extension, which enclosed the ground on which Heriot's Hospital now stands. Enlarging upon the 1689 improvements, which resulted in the construction of Milne's-court and square, he touched upon the historic associations of the buildings there, passing next to the improvements beyond the city, and concluding with the greatest change of all—the construction of the New Town, for which, he said, Edinburgh had not paid to George Drummond half the meed of gratitude that was his due. He condemned the Mound as the biggest blunder ever made by the municipal governors of Edinburgh, and urged that care should be taken to prevent a similar mistake by permitting the erection of buildings in the valley in connexion with the railway.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

The following gentlemen having satisfied the Examiners at the Examination held in London, on the 17th and 18th ult., have been granted their certificates by the Council of the Association:—

Allen, S., Manchester.	Graves, M. D., York.
Ball, B., Middleton.	Hurd, Hy., Stratford.
Cooper, W., Cheetham.	Saise, A. J., Stapleton.
Dixon, J. R., Carlisle.	Yarwood, H., Rochdale.

A Western Counties District Meeting of this Association is announced to be held at Cheltenham this Saturday, May 9, when the following papers will be read and discussed:—1. "Tarred Macadam Roads," by Mr. Joseph Hall, C.E., Borough Surveyor of Cheltenham. 2. "Description of Works," by Mr. Joseph Hall, C.E. Subsequently the members will visit the Dowdeswell Reservoir, Filters, &c., constructed under the direction of the late Mr. J. F. Bateman, F.R.S.; the Public Swimming Bath, constructed from designs by Mr. W. McLandsborough, M.Inst.C.E.; the Destructor, in course of construction; the Sewage Works; and Pitville Gardens, now being laid out.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday afternoon at Spring-gardens, Sir John Lubbock, the Chairman, presiding.

The Whitsuntide Recess.—On the motion of Mr. J. Williams Benn, it was resolved:—

"That the Council at its rising on Tuesday, May 12, do stand adjourned until Tuesday, June 2, and that there be no meetings of Committees after the day of adjournment until Wednesday, May 27, unless in a case of urgency which will not admit of delay."

The King's Scholars' Pond Sewer.—The Main Drainage Committee reported:—

"We have had before us repeated complaints from the Vestry of St. Margaret and St. John, Westminster, of floodings which have occurred in that parish, and we are advised by the Engineer, that in order to afford relief to the locality, it is necessary that a new pumping-station should be constructed on the King's Scholars' Pond Sewer at Grosvenor-road, Vauxhall-bridge. The Engineer has prepared and submitted to us contract drawings showing the proposed arrangement, and having carefully considered the same, we have to recommend—

'That, subject to an estimate being submitted to the Council by the Finance Committee when tenders are received, the contract plans and specification be completed, and that an advertisement be issued inviting tenders for the work.'"

This was agreed to.

The Proposed New Railway and Terminus.—The Parliamentary Committee, reporting on the Manchester, Sheffield, and Lincolnshire (Extension to London, &c.) Bill, said:—

"Evidence from the country districts has been under the consideration of the Select Committee on this Bill, but it is expected that the London portion of the Bill will be reached shortly. We are informed that the promoters will not assent to the conditions proposed to be imposed by the Council on the following matters:—(1) Space to be provided round the terminus; (2) Contribution towards the improvement of thoroughfares leading to the station. It appears to us that these conditions are essential. With regard to the improvement of thoroughfares leading to the station, there can be no doubt that the line would develope an enormous increase in the street traffic, and we are advised that this increase would entail a very large expenditure for street improvements, a portion of which ought, in our judgment, to be borne by the railway company. Under the circumstances, therefore, we assume that it would be the wish of the Council that counsel should be instructed to go to the full length of the petition, and to indicate that the proposed station site is unsatisfactory, and ought not to be granted. This would not necessarily interfere with the authorisation of the railway through the country districts, as the question of a terminal station in London might be left open to be dealt with in another session. We have given the necessary instructions to the Parliamentary agent, and we recommend—

'That the course taken by us in authorising the agent to instruct counsel to go to the full length of the petition, and to indicate on the part of the Council that the proposed station site is unsatisfactory, and ought not to be granted, be approved.'"

The recommendation was agreed to, after some discussion.

The Theatres Bill.—As a matter of urgency, it was resolved, on the recommendation of the Theatres and Music Halls Committee, that, in order to meet the views of theatre proprietors, the Theatres Bill should provide that the Home Secretary should appoint a permanent arbitrator to act in all disputed cases having reference to structural matters.

The Site of Millbank Prison.—The Housing of the Working Classes Committee's report, dated April 27, contained the following paragraph and recommendation:—

"On the 24th ultimo the Council had under consideration a report from your Committee on the subject of the site of Millbank prison, which stated, with reference to the offer made by the Council of 2,000*l.* an acre for eight acres of the back part of the site, that an intimation had been received that Her Majesty's Government would accept 40,000*l.*, or 5,000*l.* an acre for the land in question. Your Committee, having regard to the doubtful nature of the subsoil, and to the probable cost of the erection of artisans' dwellings on the site, recommended the Council to offer 3,000*l.* an acre for the eight acres, and the Council adopted their recommendation. A reply, dated the 23rd instant, has now been received, to the effect that the Secretary of State is unable to entertain the offer of 3,000*l.* an acre. No precise intimation has been given, on the part of her Majesty's Government, of the amount which would be accepted; and your Committee, thinking it very desirable that an early decision should be arrived at, have come to the conclusion that the best means of settling the

fair market price of the land would be a reference to arbitration. There is no provision for such a reference in the Act of 1885, which merely authorises her Majesty's Government to sell the land to the Metropolitan Board of Works at a fair market price; but there will probably be no difficulty in carrying out an arbitration if sanctioned by the Council and agreed to by the Secretary of State. Your Committee recommend –

'That a letter be addressed to the Secretary of State, inquiring whether her Majesty's Government would be willing to refer to arbitration the question of the fair price of the eight acres forming the back part of the site of Millbank prison.'"

This recommendation was rejected, on a division, by 34 votes against to 20 for it, and after transacting other business, the Council adjourned.

THE ART UNION OF LONDON:

ANNUAL MEETING AND PRIZE DISTRIBUTION.

On Tuesday last, at noon, the fifty-fifth annual meeting of the Art Union of London was held in the Adelphi Theatre, Mr. James Hopgood, Member of Council, in the chair, in the unavoidable absence of the President, the Earl of Derby.

The annual report of the Council was read by Mr. J. A. Hallett. We extract the following passages:—

"For the year now closing, the Council have to report the amount of subscription to be 5,405*l.* 18s. 6d.

The following is a brief summary of the receipts and expenditure; a detailed account will, as usual, be printed in the report. The accounts have been audited by Messrs. T. J. Geddes, J. A. Hallett, and A. Wilsden, to whom thanks are due:—

	£. s. d.
Amount of subscriptions	£5,405 18 6
Allotted for prizes	2,160 0 0
Set apart towards providing works of art for accumulated payments	370 13 0
For print of the year, exhibition, report, and reserve	1,375 3 0
Balance available for agents' commission and charges, advertisements, printing, postage, rent, &c.	1,500 2 6
	£5,405 18 6

To the local honorary secretaries and agents in all parts of the world we have, as usual, to express the thanks of the Art Union. Bonsor, of Balham, heads the list. Special thanks for active exertion are also due to Messrs. Lamb, of Hamilton, Canada; Cotes, of Bournemouth; Grundy and Smith, Manchester; Croxford, St. Leonards; and Hooper, of Montevideo. The amount to be expended on prizes will be thus allotted:—1 work at 100*l.*; 10 works at 45*l.* each; 10 works at 35*l.* each, 20 works at 25*l.* each; and 60 works at 10*l.* each, and making 101 prizes of the aggregate value of 2,000*l.*; making, with the prizes given to unsuccessful members, 301 prizes.

For the coming year, the Council have commissioned Mr. W. L. Wyllie, A.R.A., to produce an original etching representing the escape of H.M.S. *Calliope* from Apia Harbour, Samoa, on March 16, 1889. This work commemorates an episode that appeals to the patriotism of English-speaking people throughout the world. The escape of the *Calliope* was the occasion for a display of splendid seamanship and indomitable pluck, worthy of the best traditions of the British Navy. The terrific hurricane which visited the Island of Samoa two years ago swept war-ships of three nations to destruction, and the only vessel that escaped from the harbour of Apia in that storm was Her Majesty's ship *Calliope*, a cruiser, commanded by Captain H. C. Kane. At the very height of the storm, when one cable had parted, and the ship was dragging towards the reef, the *Calliope* slipped her remaining cable and stood boldly out to sea, steaming full-speed ahead in the teeth of the hurricane, and, by consummate skill in handling, she just cleared the American ship *Trenton*, which was dragging down to her destruction, and escaped into the open sea through the narrow mouth of the harbour. The moment chosen by the artist is when the *Calliope* was just passing the *Trenton*, whose crew, headed by their admiral, gave her three hearty cheers as she passed. The sympathetic and skilful treatment of the subject by Mr. Wyllie is worthy of his great reputation, and the Council believe that this fine etching should be one of the most popular works they have published.

As an alternative to this, with a view to meet the wishes of some subscribers who desire a lighter and more jocose subject, the council have secured the copyright of a picture by Mr. Dendy Sadler, entitled, 'Stuffing is good for Geese.' The picture represents an inn garden, in which are seated at a table the landlord and two post-boys, who, from the favours in their jackets, are evidently taking refreshments while the wedding party is in church, and one of them, emphasizing his words by action with his pipe, is 'stuffing' the landlord with some story, which greatly amuses his companion, who appears quite ready to confirm whatever marvels his mate's story may reveal.

Subscribers will have the option of taking for the guinea one or the other of these two etchings.

Some years ago the Council had a little book printed, giving reduced copies of a large portion of the works available for the subscription. There has lately been a large demand for a work of the same kind, and the greatly improved methods of process of production lately introduced have enabled the Council to undertake such with a greatly improved quality of work. 'The Art-Union of London Album,' as it has been christened, contains a series of very telling phototypes of the most popular of those plates now available for subscribers, with a brief description of each, and a sketch of the operations of the Society from its commencement, and a list of its agents in all parts of the world, to whom subscriptions may be paid.

Since the last annual meeting the Council have lost, by death, the valuable assistance of Mr. Jas. Anderson-Rose, for many years a member of their body. . . . .

On February 23 died Ald. Sir Thos. Gabriel, Bart., who had been a member of the Council since he was elected Lord Mayor of London, in 1866. . . .

A short time since, Mr. Henry Tate, who had been for many years a member of the Council, retired from that post on account of impaired health. Mr. Tate is a liberal patron of the arts, and the paintings in his fine gallery, at Streatham, were selected with much judgment.

To fill the vacancies in the Council, Messrs. Jno. Aird, M.P.; C. Purdon Clarke, C.I.E.; T. E. Collcutt, F.R.I.B.A.; T. Buxton Morrish, and Vincent J. Robinson, F.S.A., have been elected."

After chronicling the decease of Mr. J. R. Herbert, hon. retired R.A., Miss Maud Naftel, Mr. C. W. Cope, hon. retired R.A., Mr. H. C. Selous, and Mr. Henry Wallis, the report made mention of the thirty-third annual report of the directors of the National Portrait Gallery, which has been lately laid before the trustees by Mr. Scharf. The election of Mr. W. H. Alexander to the place left vacant by the late Lord Lamington is stated to be in acknowledgment of his benefactions to the Institution, with which his name will be always connected as a munificent patriotic donor. After alluding to the sale of the Wells collection of Sir Edwin Landseer's pictures, a year ago, the report continued:—

"In our last Annual Report we took occasion to notice the Second Congress of the National Association for the Advancement of Art, held at Edinburgh, under the presidency of the Marquis of Lorne, and we endeavoured to answer some of the criticisms passed by Mr. Hodgson, R.A., on the system of instruction pursued in the Government School of Art at South Kensington. The Third Congress of the Association was held in the autumn of last year, at Birmingham, when Mr. Hodgson was President. There is room for doubt whether it may be found expedient to hold these meetings at so short an interval as a year. Art is not like science, for ever making new discoveries, and there is a danger of monotony if people meet too often to discuss questions that are, after all, very few in number. It is, of course, understood that it is not the business of the Congress to go down to those principles about which there is, or may be, much to say. It does not concern itself with the fundamental principles of art, it is occupied with the more practical problems of how to raise the taste of the masses; how to bring out what artistic talent may be lurking in the minds of artisans; how to bring the public authority into relation with the best artistic ideas of the time; the beautifying of our towns and public buildings; the improvement of design in industrial products. These topics are not very numerous, and it is possible to exhaust what may be said on either of them. But as yet there need be no hesitation in the authorities of the Association about going on. Their business is to stir up the chief industrial centres, to set the artisans and their employers thinking on these topics, and such a result can only be brought about at the cost of considerable repetition. There was a certain fitness in the choice of Birmingham as the place for the Congress, for it is the seat of a very flourishing organisation for the teaching of art. The Corporation has, during the last few years built and furnished a capital Museum and Art Gallery, which has been visited by more than 4,300,000 persons in the five years since it was opened. The Corporation has also a very flourishing Art School which gives instruction to 3,100 students, and which costs the ratepayers some 3,600*l.* a year. The special business of the late Congress was the discussion of the best means of teaching art to the people at large, and it was to be expected that, in the course of the meeting, much should be said against the Science and Art Department and its ways. Mr. Hodgson, in his very pleasant and moderately worded address, said but little, but what he said was in the main in agreement with the views of the opposition. He wishes to *decentralize*. It is indeed a remarkable thing that in the matter of art teaching the country should have, as it were, run counter to its own traditions, as seen in all other higher branches of education. . . .

In reference to the subject of training, let us, for a moment, consider the practice of France in this respect. There, instead of rushing, unfettered and unprepared, into the work of design, a student puts himself under the guidance of some one master, and then for years confines himself to the drudgery of copying, over and over again, the elementary technical details of drawing and composition; and thus, at last, finds that his time has not been, as in his ignorance he was induced to think, thrown away, but that he has gained such a mastery of the elements of his art that the practice has become easy when called into action. Nothing can be more injurious to the success of a young artist than the idea that without long and arduous labour he can rush to the realisation of great ideas. Patient and laborious study has been, as a rule, the method of all the great artists of the past or present times.

A reform, most important for the rising generation of artists, has been effected in the Royal Academy Schools. Nothing could be better than the liberal spirit in which they were conceived, and the practical common-sense with which they have been carried through. The reform consists, first, in the framing of new rules for the admission of students; and, secondly, in the withdrawal of the rule which prevented female students from studying flesh-painting from the partially-draped figure. In future, a large number of candidates will be admitted as probationers, and the less capable of them will be ruthlessly weeded out, so that a higher class of pupils may remain to take advantage of the gratuitous teaching of the Academy. No one over twenty-three years of age will be eligible. The absurd series of shaded and stippled drawings, which have hitherto been the sole test qualifying for admission, has been reduced to one, while a life-sized drawing of a head and arm from life are required from painters, and a medallion of a head from sculptors; also a sketch of a design set by the Keeper, the whole occupying only eight days. Similar alterations govern the sculptors' and architects' departments, all of which should produce the best results. The first advantage will be the exclusion of the ordinary run of lady students, as only the best of them will be equal to undergo the new and more painter-like tests. For those who succeed in the preliminary examinations, the new regulation,—that of permitting them to study painting from the partly-draped model,—is a boon. It is inconceivable that this ban, under which they have laboured hitherto, should have been permitted to handicap them so hopelessly and so unfairly ever since the time when Miss Herford, the first lady student, broke down the barrier of prejudice which had excluded women from participating in the benefits of the Academy Schools. But the Council must not rest and be thankful."

After referring to the passing of the American Copyright Bill, and to the Naval Exhibition, to which the Art Union has contributed, amongst other things, Maclise's picture of "The Death of Nelson," the report concluded as follows:—

"The Council feel every year the growing necessity of adapting their mode of operation to the changed conditions of modern times. At one time the Society stood alone in its efforts to spread a taste for Art, but now these efforts run the risk of being overlooked among those of a crowd of less-disinterested competitors, who have adopted ways of making themselves known which the older Art-Union has shrunk from following. The Council feel, however, that the Society must not be allowed to run the risk of perishing through an excess of modesty, and that, in this advertising age, it is useless having good things to dispose of unless all means are adopted for making the fact known.

It was in obedience to the spirit of the times that the Council selected, for the publication of the past year, the set of four etchings from English pictures in the National Gallery. They believed that good etchings, after pictures which have so far established their claim to acceptance as to have made their way into the National Gallery, ought to be as popular as they are educationally and æsthetically valuable.

Nevertheless, there can be no doubt that there is a considerable section of the public whose æsthetic sense requires the stimulus of a direct appeal to their human sympathies; and, in the issue for the ensuing year of the two works already described, the Council trust they have provided this stimulus without derogating from their function of disseminating good art. It only remains for them, with the assistance of their local representatives, to take the right means of making their works known in order to secure a continuance of the public support, to which the past achievements of the Society give it a just claim."

The Chairman formally moved the adoption of the report.

Mr. T. O. Donaldson seconded the motion, which was agreed to unanimously.

On the motion of Mr. T. Buxton Morrish, seconded by Mr. Hallett, a vote of thanks was accorded to the honorary secretaries, Mr. John Sparkes and Mr. H. J. Francis.

Votes of thanks were also passed to Messrs. Gatti, for their kindness in granting the use of the theatre for the meeting, and to the ladies who assisted in the drawing for the prizes, which was then proceeded with, the principal prize, value 100*l.*, being drawn by Mr. Leighton Mills, of North Shields.

Books.

The Law of Building and Engineering Contracts, with an Appendix of Precedents and of Unreported Cases. By A. A. HUDSON, Barrister-at-Law. London: Waterlow & Sons, Limited, and Stevens & Haynes. 1891.

THE size and appearance of this book, which contains 880 pages, would lead to the belief that it is a very important work. Useful it certainly is, and that it is a testimony to the industry of the author is equally certain. But that it is too large is also a matter on which we have no doubt. For it must be borne in mind that the main elements which characterise the law of contracts generally, are also those on which contracts in regard to building and engineering are founded. The details of them are different, and it is useful for practical purposes to be acquainted with some of the special characteristics which belong to these contracts. But it is a great mistake to suppose that they require a huge separate treatise. We have not to go far into this book for an example of prolixity. On page 4 there is a section as to the citation of authorities, and in order to show the value of American decisions, a sentence from a judgment of the late Lord Chief Justice Cockburn is cited. But it is a matter of common knowledge that American authorities are not binding on the courts of this country, though when our own case-law is found wanting in precedents, those from America may assist to a right conclusion. But it would have fully sufficed if the author had stated that he cited American authorities as illustrating the law in that country, without going into this detail. On the other hand, the case-law of this country is now so large that it is a merit in a legal author to abstain as much as possible from en-



School of Art & Museum
Entrance

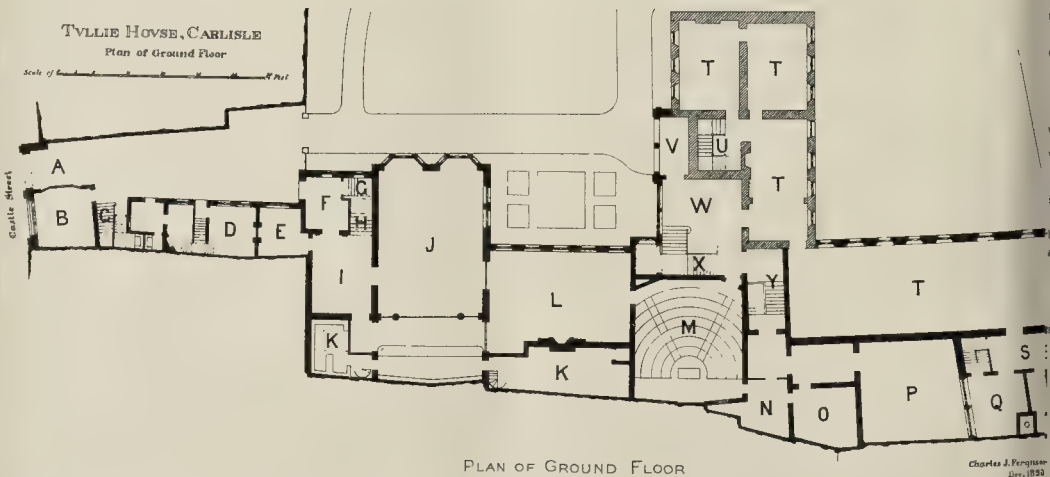


Scale of Feet 5 0



Abbey Street Front





Plan of Ground Floor

Charles J. Ferguson
Dec. 1892

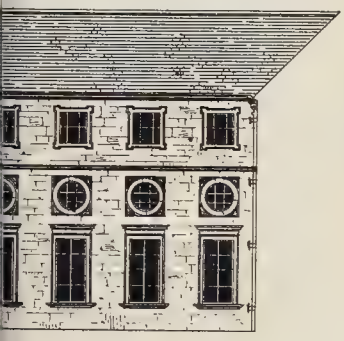


GARDEN FRONT.



LIBRARY ENTRANCE.

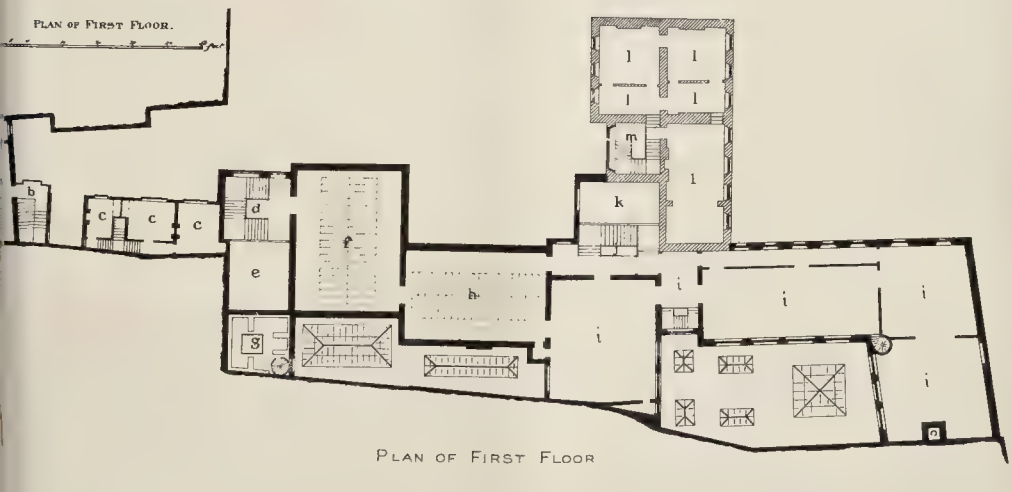
30 40 50 feet.



RONT



CASTLE STREET ENTRANCE



PLAN OF FIRST FLOOR

PHOTO LITHO SPRAGUE & Co 22 MARTINS LANE CANNON ST LONDON E C

E LIBRARY AND SCHOOL OF ART.—By Mr. C. J. Ferguson.

mbering his book with authorities and there also nothing, whether in an author or an vocate, which is more indicative of a want of wer than continual citing of authorities. ius as an instance of unnecessary citation we ay mention the case of the Arkansas Valley mpany. We are informed that in this decision dictum of Lord Coke was cited, "and the her cases on the subject collected in the guments of counsel." Considering that this cision of Lord Coke merely illustrates the ill-known rule as applied to the case of a ilder, that a personal action dies with the rson, it was scarcely necessary to give us this eless piece of information. The fact is that e work is far too "expansive," and, when alysed, its value becomes less and less. Not at it is a useless book, but it is by no means value proportionate to its size.

Mr. Hudson has, in fact, not sufficiently ought out his subject. There is no more ttled piece of law than that an architect or gineer does not impliedly warrant "the asibility of his plans." The author devotes considerable space to show that a decision of r. Justice Chitty, in a case of Cann *v.* Willson, as to a contrary effect, and was wrong. But, rong or right, it does not affect this point. In at case, the valuers had made a reckless luation of property, and were held liable for e consequences,—a wholly different thing an error of judgment in drawing plans. s regards the form of the work, it is somehat confused. There are chapters, which gain are divided into sections, which again e separated into sub-divisions. Thus chapter ii. deals with extras, which, by the way, we e informed are "the creature of building ntracts"—a very odd and also inaccurate exression, since there may be extras in the case the constuction of a ship or of a road just much as in the case of a house. The first ction of the chapter is headed with the title, What are Extras?" and sub-head (*a*) is simply ntitled "Generally." To some extent an ttempt, which wholly fails, is made to state he law in the form of propositions with illustraons and notes. This form fails, partly because he subject is quite unfitted for such treatent, and partly from a want of precision f statement on the part of the writer. useful piece of work are the precedents for arious contracts and parts of them. These re constantly of practical value. We cannot ay as much of the unreported cases. The index nd table of cases are accurate and very full, nd we repeat that the work shows great labour nd industry. But had the author, having ccumulated his materials, boldly set to work analyse them, and to discard all that was not bsolutely useful and necessary, he would have iven us a much more valuable work.

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ondon. Originally compiled by the late HERBERT FRY. London: W. H. Allen & Co., Limited. 1891.

THIS is an excellent volume, arranged upon a niform, serviceable plan, and one of the best f its kind that we know. As it has now eached to the eleventh year of publication, nd claims to be revised and brought up to ate, we are warranted in subjecting its pages a scrutiny more thorough than that which he generality of guide-books can withstand. n this latter respect, then, we find a record of assing and recent events completer and more ccurate than that contained in a much ore ambitious work which appeared two or hree months ago. We will, however, mention a ew facts which seem to have escaped obervation by the author who, we see, has nserted some corrections which we made in oticing his book on previous occasions. The lympic Theatre was re-built last year, after fessrs. Crewe & Sprague's designs, and reopened as the "New Olympic" on Dec. 3. The raditional house of Dryden, in Fetter-lane, was emolished at least two years ago; we published view of it on Jan. 24 last. The new Fish Market, y Snow-hill,—held in a building especially rected for that trade, and designed by the late ir Horace Jones,—was opened on November 7, 888; but the new Fruit and Vegetable Market, Vest Smithfield, is not yet completed. The raiety Theatre occupies the site of the later xeter Change, between Wellington and atherine streets; the old Exeter Change y further westwards, in the Strand. ewport Market has quite disappeared. The arrick Club, of Thackeray's time, was No. 35, King-street, Covent-garden. he big auction-room at Messrs. Puttick & Simpson's, in Leicester-square was not Sir Joshua Reynold's studio; it was built for the purposes of the Western Literary and Scientific Institution. The main staircase of this house still retains, we observe, the original balusters curved outwards to give more space for the ladies' hoops. The "Old Westminsters'" memorial, Westminster, commemorates also those officers who fell in the Mutiny. From a letter from Mr. Arthur Billing, which we printed on January 24 last, it seems that Wren had no share in the repair or restoration of St. Sepulchre's Church. Lord Howe's monument in the Abbey, which was erected, by the bye, by the province of Massachusetts, was removed in July, 1888, from the window in the nave south aisle on to the floor, in the north-western corner, just behind Fox's effigy. The New Club, at "Evans's," was dissolved some months since, and the premises were recently reopened by the National Sporting Club. A part of the description of the Tower is quite behind the time. The Horse Armoury,—as a building,—and Queen Elizabeth's Armoury,—which is, in fact, the upper crypt of St. John's Chapel,—were dismantled a few years ago, and their contents crowded into the White Tower. As a national collection ours is a poor one; but the ordinary half-holiday visitor took unquestioning delight in the old line of mounted figures; he can see nothing to advantage now. A very useful feature of the hand-book is the bird's-eye maps; compass-points are not given in all of them. No 1 shows houses where a space is cleared for the new Admiralty and War Offices, and the long gun has been removed to the Horse Guards, west front.

The Colliery Manager's Handbook. By CALEB PAMELY. London: Crosby Lockwood & Son. 1891.

THE above important work is a comprehensive treatise on the laying out and working of collieries, and describes nearly all the modern appliances and methods that are made use of by the mining engineer of the present day.

Commencing with a chapter on the outlines of geology, the author proceeds to explain the various ways of searching for coal, and examines in detail the construction of a mine and the necessary machinery required to work it. Such important subjects as the ventilation and drainage of mines are ably treated, and there is scarcely any kind of safety-lamp or fire-damp detector which escapes notice.

The book, which consists of nearly 600 pages, is very fully illustrated, and it will be found of great use, not only as a handbook to the student studying coal-mining, but as a book of reference for colliery managers.

Fortunes Made in Business: a Series of Original Sketches, Biographical and Anecdotic. By Various Writers. Edited by JAMES HOGG. London: Griffith, Farran, & Co.

THE outside of the book, having regard to its titles and the "£. s. d." which figures so prominently on its cover, would, at first sight, appear a humble tribute in the workshop of wealth. But it is better on acquaintance. It contains a number of short biographies of men who, though they have attained to wealth, also attained a considerable commercial or industrial position,—such, for example, as Sir Henry Bessemer and the Mintons. Men who have gained wealth by inventive powers or great energy and capacity of organisation, as Sir Donald Currie, are removed very much from a class of plutocrats who have made their money by grosser means. All the same, we should prefer to regard such men as we have instanced above rather as men of great industrial mark than as mere men who have amassed riches. In truth, the interest of the book is in the fact that in a handy form it is a collection of biographies of some of the men who, by their mechanical and organising power, have become famous in the industrial history of the century, and who are types of the best kind of modern English manufacturers. As such, it is a useful and suggestive book, and we have no doubt it will be read with interest by many to whom its title will be thoroughly distasteful.

Palliser's Miscellaneous Architectural Designs and Details, for Carpenters, Builders, &c. New York: J. S. Ogilvie.

THIS is a book of plans and designs for small houses, mostly in timber work, of a style more used in the United States than in this country. In practical merit it is a fair specimen of its class; but such books of ready-made plans are not of much real value. Of the decorative details given in the book the less said the better.

"The City of London Directory for 1891" (London: W. H. & L. Collingridge, *City Press* Office, Aldersgate-street), just issued, is the twenty-first annual issue of what is emphatically the City Directory *par excellence*, as we characterised it when noticing a former issue. Nowhere but between its covers can be found brought together so much useful information concerning the business and official life of the City proper. Specially interesting is the section entitled the "Livery Companies' Guide," which covers upwards of a hundred pages, and gives a great many interesting particulars concerning the history and functions of the City guilds, and much information about their charters, arms (illustrated and described), charities, and schools. The usefulness of this well-got-up and carefully-compiled Directory is greatly enhanced by the excellent coloured map which it contains. This map, drawn to a large scale from the Ordnance Survey, shows clearly every street and turning within the City boundary, and the boundaries of each ward and parish. The whole work is brought well up to date, and does credit to its publishers. It might be improved, however, by the lining of the map with linen, for it is a large map, and, consequently, the paper on which it is printed is rather liable to tear when it is unfolded for reference.

"The Newspaper Press Directory" for 1891 (London: C. Mitchell & Co., Red Lion-court, Fleet-street) is the forty-sixth annual issue of what is, we believe, the oldest of the now numerous Press directories. It purports to contain "full particulars of every newspaper, magazine, review, and periodical published in the United Kingdom and the British Isles," together with information about the principal Continental, American, Indian, and Colonial papers. A useful "Newspaper Map of the United Kingdom" accompanies the directory, and shows at a glance the towns with one paper, the towns with more than one paper, and the towns with daily and weekly papers. Among special new features of the present issue of "Mitchell" we may mention the "Notes of Recent Cases as to the Law relating to the Press," and the "Digest of Statutes relating to the Newspaper Press," by Mr. W. F. Finlason, barrister-at-law. Mr. Walter Wellsman, in an article entitled "Fleet-street,—1846-1890," gives an interesting account of Fleet-street as the centre of newspaper life as it was forty-six years ago and as it is now; but he takes a strictly local view of the expression "Fleet-street," which has now acquired a much wider meaning amongst journalists, and is synonymous with the London Press as a whole. This narrowness of view necessarily vitiates any true comparison between Mr. Wellsman's appendices showing the papers and periodicals published respectively in 1846 and 1890. The *Times*, the *Morning Post*, and other old-established journals, including the *Builder*, do not appear in either appendix, although they would appear in both if Mr. Wellsman had taken the wider view of what is meant by "Fleet-street." But this criticism notwithstanding, the new issue of "Mitchell," is an exceedingly useful publication.

"Shelley & Co.'s Complete Press Directory for 1891" (London: Shelley & Co., Limited, 38, Gracechurch-street) has, it appears, reached its fifth edition, a copy of which has just been sent to us. It is well up to date, compact, and well-arranged. As usual, it summarises the leading newspaper law cases for the past year, some of which resulted in important decisions affecting copyright and the law of libel.

"Willing's (late May's) British and Irish Press Guide" for 1891 (London: James Willing, jun., 162, Piccadilly) is now in its eighteenth year. It is compact and well-arranged, and while preserving all its old characteristic excellences, it includes much new and interesting matter, rendering it exceedingly useful as an advertiser's directory and handbook.

CARSON'S PAINT.—We are asked to mention that the business of Messrs. Walter Carson & Sons, the well-known manufacturers of paints, colours, oils, varnishes, &c., has been removed from the old premises in La Belle Sauvage-yard, Ludgate-hill, to the Grove Works, Battersea.



Correspondence.

To the Editor of The Builder.

ROAD FROM HOLBORN TO STRAND.

Sir,—It is announced that another effort is being made to induce the London County Council to take up this much-needed improvement. I observe with satisfaction that the present scheme is considerably modified from that put forward by the Council last year. Two, at least, of the points I have contended for have been adopted, namely, the provision of entrances to the Strand at its widest part, opposite Somerset House, and to Holborn by the Royal Music Hall. I note also provision for the Wych-street and other branches.

In the absence of a published plan, it is impossible to judge whether the objections I have urged to the first scheme have been overcome in this.

In the first place, it may safely be laid down that a scheme involving so much destruction should, as the only means of compensation, provide ample accommodation for new buildings. It is quite clear that no more shops are wanted in this part of London, but that there is a great demand for large sites for business premises, such as those of the large printing and publishing firms, who have already shown their disposition to migrate westwards from their present cramped quarters. There is also the demand for large blocks for workmen's dwellings. Now, the road proposed by the first plan, cut diagonally across the existing roads, and provided almost nothing but triangular pieces of ground, the most worthless form possible for building on, and quite unsuited for such purposes as I have mentioned above. Furthermore, from beginning to end, the line of frontage was cut by the corners of existing buildings, such as Freemasons' Hall, the electric-light works, a board school, &c. There was, therefore, the very least possible opening for buildings of importance. To finish all, a valuable frontage in the Strand was destroyed, and the entry into the Strand made down a hill with a slope of 1 in 37,—a fact alone sufficient to condemn the scheme. I recapitulate these points, as we have at present no knowledge that this scheme has been abandoned.

The new scheme, we are assured, has none of these faults, but I confess to a little scepticism on the subject. Assuming, however, that it is free from such objection, I should have no argument to raise against it. The main advantage of the route through Lincoln's Inn-fields was the ease and economy with which it could be carried out. We are threatened with a fierce opposition from the inhabitants of the Fields to any attempt to take a thoroughfare through their sacred (!) seclusion. This seems to me quite a childish threat; some of those having offices in the Fields have been among the foremost among those demanding that the ratepayers of London should give them improved access to their premises, and if the inhabitants of Russell and the other squares will have to put up with the traffic caused by the removal of the gates, one can hardly suppose that any tribunal in the world will do other than contemptuously brush aside any complaints so utterly unreasonable.

Now it is stated that one of the greatest objections raised by me to the entry to Holborn by Little Queen-street will be obviated by the provision of a circus at this, the narrowest part of the thoroughfare. It is, of course, obvious that those who will gain most by the adoption of this route, are the proprietors of the Holborn Restaurant, and if they are prepared to come forward handsomely and present the public with the land belonging to them at the end of the street, it may be quite worth while to adopt this plan, always insisting that the continuation of Great Queen-street to Holborn is also carried out.

It must, however, be borne in mind that it will become necessary eventually to widen the first part of Southampton-row, an operation that should obviously be, if possible, carried out with a reconstruction of Kingsgate-street.

I have shown what I take to be the proposed route by a dotted line.

The discussion that went on seems to have so much improved the present plans that I would beg the attention of the promoters of the new scheme to my letter in your journal of October 12, 1889. I there pointed out that the route down Woburn-place from which so much is expected was, in fact, of no use except to serve Euston Station, but that the bulk of the railway traffic would, as now, pass down Guildford-street. My suggestion was that the Lincoln's Inn-field's-road should be taken through Day & Martin's, as shown by the strong lines on the enclosed plan. A poor and decaying neighbourhood would thus be opened up and the value of the squares for residential purposes preserved.

It must not be forgotten that that value is likely very materially to improve in consequence of the easy and pleasant access to Piccadilly and the Clubs provided by Shaftesbury Avenue.

If the new scheme for the Strand-road be adopted, the new route northward should pass down Theobalds-road, and join some such road as I have proposed.

In particular, I wish to urge that even if this part be not adopted, or if it be deferred, no time should be lost in making the new Tonbridge-street that I have proposed.

Some of the worst rookeries of London, that are a standing trouble to the St. Pancras authorities, would thus be removed, and an access provided to the two great stations at

small cost, and at the most convenient place possible.

Reference to my map will show this at once, and a visit to the locality will be the strongest argument in its favour.

It will also be seen from the map how probable it is that when the gates are freed little of the traffic but that of the point-to-point cabs will run through the squares. It is clear that omnibus traffic from the north will, at any rate, follow its present lines, passing westward by Tottenham-court-road, and eastward by Gray's-inn-road.

If the railway traffic from King's-cross to South London be diverted from the squares in the manner I suggest, it is probable they will suffer little from the new arrangements.

The other point I would again advocate strongly is that I brought forward on April 20, 1889, namely, the opening of Drury-lane, thereby providing access from the north and west to Fleet-street. This I regard as most important, since it can be done so easily, and if ever such work can be made remunerative surely this can. I would suggest to the Strand Vestry that instead of opposing the Holywell-street improvement, which must come sooner or later, they should make it a condition of such improvement that Drury-lane should be opened, and their rating value in consequence largely increased.

Many of those who have written have dwelt on the supreme importance of providing more routes from West to East. The impediments of Covent-garden, Lincoln's-inn, the Record Office, and the railway are fatal to the idea of any middle road, nor could such a road compete with the advantages offered by the Viaduct. It will be seen at once, too, by the map that there is no starting-point for such a road. Moreover, it is useless providing access for traffic into the City when it is hopelessly congested at Cheapside.

One great cause of difficulty in the City is the want of convenient access to Liverpool-street by a route other than through the heart of the City. One plan would be to continue the fine street that now leads from the foot of the Viaduct through Smithfield; but there would be the difficulty caused by the markets to be overcome.

If Christ's Hospital be acquired by the City for Civic purposes, as is devoutly to be hoped, an opportunity will occur of running a fine new street from the Viaduct, at St. Sepulchre's Church, down Little Britain and across Falcon-square, to join London-wall. An immense relief to City traffic would thus be afforded.

It will be seen what an important thoroughfare Long-acre may become when Queen-street is opened, in the way suggested, into Holborn. It has been pointed out that this traffic might very well go along Shaftesbury-avenue, but the avenue will have quite enough to do, as it will remain the route to Piccadilly from the north by Tottenham-court-road, and from the east by Theobald's-road, the traffic of which is increasing enormously. Rosebery-avenue will also, when complete, bring a very large Islington traffic this way. As I showed before, the easiest way from Piccadilly to Fleet-street will be by Long-acre, and the improved Drury-lane, since the dip into the Strand, will be avoided.

RALPH NEVILL, F.S.A.

Roll's Chambers, Chancery-lane.

TESTS OF IRON AND CONCRETE BEAMS.

SIR,—May I offer some further explanation respecting the tests of my iron and concrete beams so fully described and ably commented on in last week's issue of the *Builder*? The experiments show that the rectangular specimens with the coarser breeze at seven days old were superior to the flanged specimens with finer breeze at twenty-one days. It also appears that these seven day specimens were nearly half the strength of the best selected fir timber. As the concrete at this age has reached only a moderate proportion of its ultimate strength, the strength of timber can be easily attained, and there is probably sufficient iron in these specimens for that purpose.

The ¼-in. rods, allowing for the tensile strength of the concrete, were exposed to a tensile stress exceeding 20 tons per square inch immediately before the first crack in the twenty-one-day specimens; after which, the tensile strength of the concrete being destroyed, the stresses must have been nearly equal to 25 tons per square inch, and the non-failure of these rods can only be attributed to the good quality of the iron (Tudhoe Crown) and the extra strength due to rolling to a small diameter. In any case sufficient holding surface can always be obtained for the required quantity of iron by employing a larger number of rods or wires of a smaller diameter. For instance: two ¼-in. rods, although only one half the sectional area of one ½-in. rod, would have exactly the same amount of surface exposed for the adhesion of the concrete.

Owing to the low price of coke breeze, it is believed that these beams can immediately be produced at a slight advance on the cost of fir timber.

We have then, practically, a new building material of unlimited application, possessing the strength of timber, but incombustible and rot proof, suitable for building into brickwork, and for exposure to the weather.

May I also thank you for your interest displayed in these experiments, and for bringing them before the notice of the trade?

FRED. G. EDWARDS.

TENDERS AND QUANTITIES.

SIR,—Herewith I enclose you exact copy of "Notices," received on the 1st inst., which I am induced to ask you to publish because I have an uncomfortable idea that a threat is implied.

I make no comment on the absence of names by which to identify either Committee or Secretary, but I should like to ask whether, in your opinion or in that of your readers, the requests contained therein are reasonable; and whether architects are morally bound to comply with them?

For myself, I often find it difficult to induce my clients to bear the expense of taking out quantities, while so many builders are willing to take them out free of charge.

Where the amounts of tenders are widely divergent, I think it charitable sometimes to withhold them; and in many cases where the lowest tender is accepted, my clients refuse to communicate the amounts, no matter how divergent they may be.

Is it expected that architects shall, in such a case, oppose themselves to the wishes of their clients?

EDWIN PENN.

Stoke-upon-Trent, May 4, 1891.

The following is the circular referred to by our correspondent:—

"Hanley, April 20, 1891.

We are requested by the Potteries and Newcastle Branch of the National Builders' Association to say that in future they request that a list of tenders be sent to each competitor after every competition, also quantities to be supplied for all works over 100*l*.

And in the interests of the trade they hope these notices will meet with your approval.

(Signed) THE COMMITTEE."

ARE ARCHITECTS MEMBERS OF A *LEARNED* PROFESSION?

SIR,—Apparently the reply is doubtful, to judge by a *learned* remark in Cassell's *Family Magazine* for the present month, p. 353:—"There are now at least four learned professions—the Church, Law, Medicine, and Engineering." The words "at least" may, however, afford some consolation. B.

ROAD ROLLER OR TRACTION ENGINES.

SIR,—I shall be obliged if any reader of the *Builder* can give me a reply to the following query:—In a county borough in the South of England is situated at the junction of two streets an ancient building; the said two streets are constantly used by a road roller, the property of the Town Council, and traction engines. These when passing shake the building. Should any damage be thus caused, has the owner of the building any claim against the Council or the owners of traction engines, and would the use of these engines be considered as extraordinary traffic? The inquirer will be glad of any information on the subject. W.

The Student's Column.

VENTILATION AND WARMING.—XVIII.

JETS AND PUMPS.

THE use of jets for the purpose of inducing a current of air or other fluid has been known and practised for over half a century, but their application to the ventilation of buildings has not been very considerable, partly owing to the noise frequently accompanying the employment of a jet, partly because such an apparatus is rather an extravagant method of utilising energy when adapted to ventilation.

Professor James Thompson's water-jet pump, the disposition of which is shown in the accompanying diagram (fig. 32), is an interesting example of the operation of jets. Here a jet, J, supplied with water from a reservoir, R, discharges into a cylindrical chamber, connected by a pipe, P, with a water-supply, or well, W, and, escaping in cone-like form, drives the air before it, and, reducing the air-pressure in P, draws up the water from W, and raises it to the cistern, or outfall, C. The power of the jet depends, of course, largely upon the head or pressure it receives from the height of the reservoir, R.

The efficiency of jets, and the conditions under which this efficiency is at a maximum,

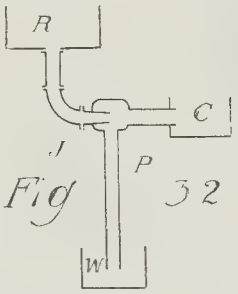


Fig 32

have been investigated chiefly with a view to their employment in the construction of locomotive engines.

Jets in steam-engines are adapted to the production of a forced draught through the furnace by means of the blast-pipe, which is nothing more than a steam jet creating a strong upward current in the chimney, or to the supply of water to a boiler by means of a Giffard's injector or similar contrivance.

The principle of Giffard's injector will be

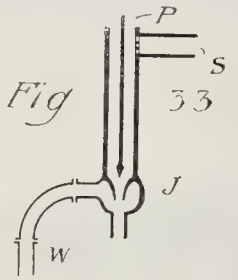


Fig 33

understood from fig. 33. The steam is admitted by the pipe S, from the upper part of the boiler, to a jet, J, the aperture of which can be partially or wholly closed by the plunger, P. As in the water-jet pump, the escape of steam from the jet draws up the water through the pipe W, and both water and condensed steam re-enter the lower part of the boiler.

The volume of air drawn up by the action of a jet depends partly upon the pressure of the motive gas (whether steam or compressed air), partly upon the sections of the orifice of injection and of the pipes or ducts, as well as, of course, upon the amount of the resistances the air has to overcome in reaching the aspirating chamber.

As the principle of the jet has been, as we have said, largely employed for the blast pipes of locomotive engines, the determination of the most effective length of chimney beyond the jet has naturally received considerable attention at the hands of experimental investigators. It has been found from the experiments of various observers that the most effective length of flue (beyond the jet) is quite independent of the size of the jet or of the pressure of the motive gas, but is wholly dependent on the diameter, the maximum of effect being obtained with a flue from six to eight diameters high beyond the jet. This, therefore, we may note as one of the conditions of efficiency in applying the jet as a motive agent in ventilation.

The form of the jet to obtain the maximum of efficiency is naturally of importance. It has been found by experiment that a conical jet with an angle of 5 deg. to 7 deg. gives the best results. The length of the jet cone is one of the factors determining the pressure at which the jet works, and of this we shall have somewhat to say presently.

The relation of the diameter of the jet orifice and of the flue varies in different circumstances, but we may take it that for ordinary cases the proportion of 1 : 10 in their diameters will give good results.

The position of the jet is also important

By experiment it has been determined that the mouth of the jet should always be in the centre of the flue. Any deviation from this prevents the formation of a regular cone of the expanding fluid issuing from the jet, and so detracts from its efficiency.

Experiments with the chimneys of locomotives have proved that the jet orifice should not be at a greater distance from the base of the flue than 1½ times the diameter of this latter; but in the application of jets to ventilation, it is usual to make the flue continual below the jet, so that this is within the flue, and the latter, so to speak, has no base. Such an arrangement also complies with the necessary condition that the area of the flue should be at least equal to the sum of the areas of the jet and of the duct leading to the flue.

It has been found that increase of pressure in the jet is not conducive to a proportionate increase of volume in the amount of air moved, or to economy of the consumption of energy. The greater pressure does not produce results equivalent to the increased expenditure of steam or compressed air. Thus, with a pressure of 50 millimètres of mercury, 41 grammes of air may be moved with the consumption of 51 grammes of steam; while, if the pressure is increased to 600 millimètres, the volume of air aspirated becomes 125 grammes, with an expenditure of 226 grammes of steam.

For locomotive-engine work, jets are usually simple—that is, they are formed by a single tube of diminishing diameter; but jets with an annular orifice have been used for compressed air with good results, and an application of somewhat similar principle is seen in what is known as Kœrting's injector, the arrangement

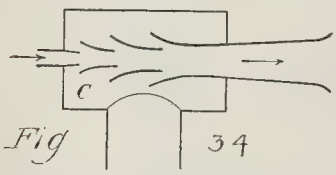


Fig 34

of which is shown in fig. 34. Here the original jet is connected with a series of others of gradually-increasing diameter, each of which receives the discharge from its predecessor, and also draws a supply of air from the enveloping-chamber, C. The excellent results of this device are seen in the following experimental figures. If R = the diameter of largest jet orifice, r = that of the smallest, and P = resulting pressure in millimètres of water, then, with an initial pressure of three atmospheres,

When $\frac{R}{r}$ = 17·5 P = 80
= 23 = 50
= 87 = 15,

and the volume of air aspirated per kilogramme of steam expended is from 30 to 160 kilogrammes.

As we have before intimated, the employment of jets for ventilation is extravagant in the expenditure of steam for the results obtained, and still more so if compressed air is used, for in this latter instance there is a further waste of energy from the loss of efficiency in the engine employed to compress the air. Jets, therefore, are advisable only in certain cases. It may sometimes be more economical to waste steam power in jets than to apply it to a more efficient engine, when the advantages of the easy transmission through steam-pipes compensates for the loss of energy.

Although it is true that pumps are amongst the means employed for the production of artificial air currents in ventilation, yet their efficiency is of a very low order. As they work at comparatively low speed, they must necessarily be of large size, and hence heavy and cumbersome in construction. This in its turn involves a large expenditure of motive power to move not only the air, but also the cumbersome moving parts of the pump apparatus. Thus it results that the volume of air moved by this means represents a profitable expenditure of only about one-third of the horse-power actually used.

The German Exhibition, Earl's Court.—This Exhibition is announced to be opened this Saturday, May 9. It will remain open until October.

SURVEYORSHIPS.

York.—At the quarterly meeting of the York City Council on Monday last, it was resolved by nineteen votes to thirteen to increase the salary of Mr. Creer, the City Surveyor, from 400*l.* to 450*l.*, and that it be advanced by an additional 50*l.* per annum upon the expiration of the third year of his engagement with the Corporation.

Southall (Middlesex).—Mr. Thomas Newell, architect and surveyor, of York-buildings, Adelphi, has been appointed Surveyor to the Southall-Norwood (Middlesex) Local Board.

OBITUARY.

Mr. Thomas Verity, F.R.I.B.A.—We hear with very great regret that Mr. Thomas Verity died at 11 o'clock on Wednesday morning, at his residence, Cathcart-road, South Kensington, from pneumonia, after an illness of two or three months. He was elected a Fellow of the Royal Institute of British Architects in 1878. We hope to be able to give some further particulars of his professional career in our next. In the meantime, we may say that he was first brought into prominent notice by gaining the first place in the competition for the "Criterion" Restaurant, Piccadilly, a building which was carried out, and subsequently enlarged, under his direction. He held the appointment of Consulting Architect to the Lord Chamberlain, and designed numerous works, of which we may make mention of the following, which have been illustrated in our pages on the dates mentioned, viz., the "Criterion," Piccadilly, July 8, 1871; the Alexandra Theatre, Panton-street, Haymarket (now known as the "Comedy" Theatre), June 18, 1881; Nottingham Municipal Buildings, January 19, 1884 (in conjunction with Mr. Hunt); design for New Admiralty and War Offices, September 27, 1884 (in conjunction with Mr. Hunt); Second Premiated Design for Richmond Municipal Buildings, August 24, 1889; and the Green Park Club and Chambers, Piccadilly, January 17 last.

Mr. E. W. Farebrother, A.R.I.B.A.—The death is announced of Mr. E. W. Farebrother, architect, Grimsby, which took place on the 26th ult., from abscess on the brain, following an attack of influenza. His latest completed work is the new Artillery Barracks at Grimsby. He has also recently completed plans of the new Welholme School and the Grimsby Workhouse. A correspondent says that although Mr. Farebrother was reared in the office of an eminent church architect, "he nevertheless possessed a strong penchant for Italian Renaissance, in which he greatly excelled. Fertile in design, his works were distinguished by much originality and a bold and vigorous style, showing great refinement of detail and delicacy of enrichment."

GENERAL BUILDING NEWS.

Church of St. Peter-le-Poer, Old Broad Street, E.C. — This church having been closed some months for general repairs, new seating, &c., was opened on Easter day. The present church was erected in the year 1791, just 100 years ago. At the widening of Broad-street, St. Benet Fink Church having been removed, the parishes were united under the Union of Benefices Act of 1860, with St. Peter-le-Poer. The alterations have been confined to the interior, which is remarkable in plan, as being an exact circle 56 ft. in diameter, lighted entirely from twelve large clearstory windows, in the lantern of roof, and with a small semi-circular apse for altar table. The gallery, which extended round the whole of the walls except the apse, has been removed, a small portion only being retained for the organ. The old oak seats have been removed, re-using the old framing, converting them into open benches throughout. The old pulpit, reduced in height, has been refixed. A portion of the floor has been raised two steps above the general area to form choir, which is fitted up with open ornamental framing and stall-ends. The floor to apse has been raised three steps, and the old columns and pilasters forming reredos almost entirely re-modelled and painted lapis lazuli, with burnished gilded caps and bases. The walls throughout are ornamentally painted to represent pilasters, with panelled and arcaded screen work enclosing the whole. The general alterations were carried out by Mr. W. Downs, of Walworth, the decorative works by Messrs. Pitman & Son, of Newgate-street, the mosaic floors by Messrs. Mainzer & Kempthorne, and the wrought-iron gas standards and general gas-fittings, together with a brass lectern, were made by Messrs. Jones & Willis, of Great Russell-street. A new font of alabaster, the gift of the rector, was executed by Mr. Gilbert Seale, of Walworth, the whole having been carried out from the plans and under the superintendence of Messrs. Arthur and A. E. Billing, F.R.I.B.A., Bank Chambers, Tooley-street, S.E.

New Bank Premises, Manchester.—The new premises of the Manchester branch of the National Provincial Bank of England have just been opened. The new buildings occupy a central position at the corner of York-street and Spring-gardens, extending along York-street to Concert-lane. The bank itself occupies the ground floor, is 25 ft. in height, and on plan measures upwards of 90 ft. by 40 ft. It is lighted on the street side by six large mullioned and transomed windows, protected by wrought-iron grilles. Above, the elevation is divided below the cornice into two stories with Ionic pilasters standing on pedestals, with panels between the windows. Above the cornice is a range of gabled dormer windows, the intervening spaces being filled with open arches, through which the roof is visible. There are two entrances to the bank—one at either end—with pediments above them, and with projecting balconies on the second floor, the whole surmounted by gables cutting into the otherwise unbroken roof. Towards the streets the fronts are faced with Burntwood stone from Derbyshire, and the internal areas with glazed tiles. Internally, a series of arches radiate towards the street from a large roof-light on the south side of the bank, and spring from columns which carry the walls above. All these arches, columns, and walls of the bank, vestibules, and entrances are lined with Burmantofts faience. The woodwork is a combination of walnut and mahogany. Vaulted strong-rooms for the storage of bullion and securities occupy the greater part of the basement, where both walls and vaults are lined with white glazed bricks. The three stories above are approached by the entrance near the top of King-street, from whence a broad staircase lined with coloured glazed bricks, and a passenger-lift leads to the stories above. The building is fireproof throughout, and the work has been carried out by Messrs. Robert Neill & Son, from the designs of Mr. Waterhouse, R.A., the architect; Mr. W. Rutherford acting as clerk of works. The building has been erected at a cost of between 60,000*l.* and 70,000*l.*

Waterloo Church, Liverpool.—Messrs. Paley, Austen, & Paley write to say that a paragraph we published under this heading gives a wrong impression of the facts. According to their letter there was a competition, but none of the competing designs were accepted, and they were afterwards commissioned to build the church quite irrespective of any of the competing architects.

Presbyterian Church, Doncaster. — The foundation-stone of the new Presbyterian Church, which is being built in Waterdale, Doncaster, was laid on the 25th ult. The building will be 96 ft. by 44 ft., and accommodation will be provided for 500 persons. The style adopted is Perpendicular, and the building will be faced with pressed bricks with Bath stone dressing, and the roof will be covered with Welsh slates. The woodwork inside the church will be of pitch-pine. The church will have a nave with two side aisles, two transepts, and chancel. The south transept is intended eventually for the choir, but before a permanent organ is built the choir will occupy a raised dais in front of the chancel, in the centre of which the harmonium at present used in the services will be placed. On the south-west of the chancel will be the organ-chamber and choir vestry, with side entrance for the choir. On the north side there is an entrance, provided mainly for the school-room, to be afterwards built. On this side also is the minister's vestry and lavatory. The nave will be paved with red Staffordshire floor tiles, and the dais and chancel with Minton's encaustic tiles. The heating of the church will be by means of Constantine's patent convoluted stoves. The internal fittings will include a teak pulpit, the gift of the architect, Mr. H. Athron. The builders are Messrs. Arnold & Sons.

New Warehouses in the City.—We hear that a large block of warehouses is about to be erected on the site of Messrs. Warner & Co., Cripplegate Bell Foundry, between Red Cross-street and Jewin-crescent, to be known as "Bradford-avenue," at an outlay of 30,000*l.* The whole of the buildings are to be erected by Mr. Richmond Nurse, of Clapham and Westminster, from the drawings and under the supervision of Mr. Chas. J. C. Pawley, architect, of Princes Mansions, Westminster.

New Vestry, St. Matthew's Church, Bolton. —Referring to our notice of this in our issue of the 2nd inst. we are asked to mention that the floor has been laid with Lowe's patent pitchpine wood block flooring.

SANITARY AND ENGINEERING NEWS.

The London Water Supply Bills.—The Select Committee of the House of Commons, to whom was remitted the public and private bills of the Session for dealing with the London Water Supply, as we stated last week, rejected the scheme of the Corporation of London, for establishing a Water Commission, and they are now directing their attention to the measure entitled the Metropolis Water Supply Bill. This Bill is promoted by fifteen out of the forty vestries and other local authorities in the metropolitan area, and its purpose is the creation of an independent body, to be called the Water Trust, and the acquisition on arbitration terms of the existing water supply systems. This Trust is to have the same powers and obligations as the existing companies have, and the intention of the promoters is to improve the supply, and to equalise the rates. The London County Council oppose the Bill primarily

on the grounds that no new authority should be created—neither a Commission nor a Trust—to whom the water supply should be entrusted, and that the County Council should be the authority to deal with the supply on behalf of the consumers. Eight of the forty local authorities are adverse to the measure as it stands, holding that the new body, whatever form it may take, should not purchase the present undertakings, but should set up a new competing system; but the promoters are of opinion that it would be impracticable to adopt that course. Originally there were fifty-seven petitions lodged against the Bill, but they have been reduced to nineteen, those including seven from the existing water companies. It is proposed that the Trust shall consist of thirty-nine members, elected by the county electors of the water area, supplemented by a Board of Arbitration composed of four members nominated by the President of the Local Government Board, the Chairman of the Institute of Bankers for financial purposes, the President of the Institution of Civil Engineers for engineering questions, and the President of the Institute of Surveyors for the purpose of valuation. Some further particulars of the Bill were given in the *Builder* for April 4 last, p. 266. In the course of his explanation and advocacy of the Bill in Committee, Mr. A. G. Rickards stated that the districts forming the watersheds of the rivers Thames and Lea would remain as they are, untouched by the scheme, but that, together with the chalk wells of Kent, and the water from the lower strata of Surrey and Hertfordshire, they would furnish a sufficient supply for the metropolis for some years to come. [In face of the figures which we have cited, we think this is exceedingly doubtful.] Mr. H. Wilkins, Clerk to the Vestry of St. James's, Westminster, who really initiated this project, after relating the history of the movement, explained that the main reason why the promoters desired the proposed Trust, rather than the London County Council, was that the area governed by the County Council was but a small part of the whole water supply area. The inquiry is still proceeding.

ALNWICK WATER SUPPLY.—The Alnwick Union Rural Sanitary Authority have applied to the Local Government Board for sanction to borrow 3,180*l.* for a new water-supply by gravitation from springs at Stanton Grange, to supply Warkworth Churchside, Radcliffe, Hauxley, and Togston. About 8½ miles of cast-iron socket-pipes will be required. The scheme has been got out by Mr. Fred. R. Wilson, Sanitary Engineer, Alnwick, Northumberland.

RADSTOCK WATER SUPPLY.—The Radstock Local Board (Somerset) has appointed Mr. J. Edward Willcox, C.E., of Birmingham, as consulting engineer in connexion with the proposed water supply for the town and district.

FOREIGN AND COLONIAL.

FRANCE.—The new *Salon* of the "rejected" at Paris will open on the 21st, at the Palais des Arts Liberaux.——The Museum of Decorative Art, closed for some time for alterations, has just reopened at the Palais de l'Industrie.——M. Rodin, the sculptor, is to execute the intended monument to Franck, referred to in our last.——A committee has been formed to raise a monument to the memory of Chapu, the sculptor, in the cemetery of Mée, his native town. M. Daumet, the architect, receives subscriptions for it.——It appears that the pompous monument to Meissonier proposed by M. Mercié is to be abandoned. At the request of his widow, the illustrious painter will be represented seated with his head leaning on his hand in an attitude familiar to those who knew him, and with military emblems at his feet. Some of his principal works will be reproduced in bas-relief on the pedestal.——The inauguration of the monument raised at Nice to the memory of Garibaldi has been fixed for June 17.——At Moret, near Fontainebleau, there has just been opened an interesting exhibition of artistic faience.——The Société des Amis des Arts of the Eure has just opened, at Evreux, a competitive exhibition of engraving, etching and lithography.——The town of Epinal has opened a competition for a college and industrial school, at a proposed cost of 550,000 francs. The same town has also set on foot a competition for a covered market, not to exceed 250,000 francs.——The town of Joigny (Yonne) has put to competition the proposed rebuilding of its Communal College.——The American painters have opened an exhibition of their works at Paris.——There is opened to-day at the Palais des Beaux Arts, the exhibition of "Arts au début du xixe siècle." This exhibition, made with the concurrence of the "Garde-Meuble National," includes a faithful restoration of Parisian apartments under the First Revolution, the First Empire, and the Restoration.——The death is announced, at the age of forty-one, of M. Adrien Marie, a draughtsman of much talent and a frequent contributor to illustrated journals in London.——We learn also of the death of M. Félix Périn, Architectural Inspector of Works at the Bibliothèque National. It was thanks to his care and zeal that this precious monument was saved from the Communal fires in 1871.——The Superior Council of War has at length definitely before it the question of the suppression of the fortifications from the Porte d'Auteuil to the Point du Jour, and on to St. Ouen. In the project now proposed this line will be replaced by advanced works which will embrace the Bois de Boulogne, Suresnes, Puteaux, Courbevoie, Asnières, Neuilly, Perret, and Clichy. The expense is estimated at about 120 million francs.——The Art Exhibition which has just been opened at Pau is composed of about 2,000 works of painting, sculpture, engraving, and tapestry. It includes a good many objects belonging to the Château de Paris.——The Académie des Beaux Arts will have to proceed shortly to the election of a member in place of the late Prince Napoléon. Among the candidates, M. Georges Lafenestre is the one who has the most chance of being elected.

BERLIN.—Last year the law courts found that at present the Prussian Government, contrary to the general idea, had legally no right to monopolise the laying of telephone connection in the city of Berlin or any other town. The Government now intends bringing in a Bill before the "Reichstag" which will give them this monopoly. The Berlin municipality is expected to organise a strong opposition to it. In reference to the German participation in the coming Chicago Exhibition, the official *Gazette* tells us that the Chancellor has asked the German "Bundesrath" to accept the invitation sent by President Harrison, to elect a special envoy to look after German interests, and to vote a sum of money to ensure the representation being a good one. During a meeting of the Vereinigung Berliner Architekten on the subject of the proposed alterations in the building-regulations of the city, it was stated that the Minister of Public Works had now taken the matter in hand, and intended calling together a committee to arrange the question.——The Emperor during his recent stay in Northern Germany inspected the works on the North Sea-Baltic Canal, and cut through the dam keeping back the waters from the first section completed.——As a sign of the progress made in deepening the river and canal communication from the sea to Berlin, may be taken the appearance of a torpedo-boat, with six-foot waterway, on the River Spree, anchored at the back of the Royal Palace, where it will be stationed, at the disposal of the Emperor, until further notice.——In connexion with the opening ceremony of the International Art Exhibition, the Emperor invited the members of the managing and hanging committees, the delegates of the different groups, and a number of distinguished artists, to dinner at his Potsdam Palais on Saturday last, the Chancellor, the Cabinet Ministers, and a few other guests being present. The Emperor had invited the same party to spend the evening of the Thursday before at the Royal Theatre, at which a patriotic play was given.——The total of the subscription list for a monument to the ex-Chancellor Bismarck, to be raised by voluntary contributions, has now reached 1,000,000 marks, or nearly 50,000*l.* The monument will be erected in Berlin.——The Victoria Theatre at Berlin was used for the last time on the 30th ult., and the large block is now to be quickly pulled down to make room for the extension of the new Kaiser Wilhelm Strasse, in itself a continuation of the well-known Unter den Linden. The Victoria Theatre, which had the largest stage of Berlin, was originally built as a double theatre, a so-called summer and winter one, with its stage in the centre of the block and a closed auditorium, with some 1,350 seats on the one side, and an open auditorium, with some 1,500 seats, on the other. (The plan is illustrated by Fergusson.) The pieces put on the stage (Italian, Russian, French, and German opera companies each had a turn) not having as a whole proved very successful, and the idea of having a summer auditorium not having found favour, this part of the building was closed, and adapted as a scenery store, and the winter auditorium alone used. Since 1870 this part of the house and the stage have been subject to continual building alterations by order of the authorities, so that some of the worst dangers, those of bad exit, &c., were in time partially done away with. Notably dangerous as the theatre was known to be, no serious accident happened through fire during the thirty years of its existence, and scarcely twenty minor mishaps from the same cause can be proved, a wonderful statistic; thanks solely to the careful watchfulness observed during the performances, and the continual patrolling night and day when the house was empty.

MISCELLANEOUS.

TECHNICAL EDUCATION IN THE PAINTING TRADE.—An important meeting of representative men in the painting trade was held on Saturday last, the 2nd inst., at the Finsbury College of the City and Guilds of London Institute, to consider what means could be taken to improve the quality of the workmanship in their trade. The chair was taken by Mr. J. D. Crace. A paper was read by Mr. Wm. Fourniss, Instructor in Decoration in the Applied Art Department of the College. A discussion followed, which resulted in the following resolutions being carried unanimously:—1. "That it is expedient that Trade Classes for Painters should be established for the benefit of the Trade." 2. "That the Guilds of London should be respectfully requested to establish Trade Classes for Painters at the Finsbury Technical College." Some discussion ensued in reference to the question whether or not certificates should be offered and given for proficiency in the painting trade, in which Mr. J. Shaw took part. No resolution, however, was come to in respect to this. Dr. Silvanus P. Thompson, Principal of the College, and Mr. J. D. Crace, expressed their entire concurrence with the objects of the meeting.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Town-hall, Westminster, on Monday evening, May 4, Mr. J. W. Wilson, junr., vice-president, in the chair, a paper was read by Mr. C. C. Carpenter on "Modern Coal-Gas Manufacture." The author commenced by saying that upwards of ten million tons of coal were carbonized annually for gas-making purposes in the United Kingdom. The subject of carbonizing was dealt with, reference being made to the shape of retorts best adapted for the purpose, as well as the most suitable settings of them and their construction, the relative advantages of "moulded" and "brick" or "tile" retorts being also considered. The various modes of retort heating by direct or gas furnaces were next explained, reference being made to a system of multiple-heated settings introduced by the author in 1886. Charging machinery and inclined retorts were next touched upon, as well as other details of retort-house working. Beale's exhausters for pumping foul gas were illustrated and discussed. The washing and scrubbing plant for the removal of soluble impurities was explained, and the necessity of protecting it from atmospheric changes was pointed out. Purification by means of lime and oxide was next considered, special reference being made to what are known as "sulphur compounds." The author traced the history of this impurity and described the methods of its removal, stating also how the process depended for its efficacy upon the presence of a percentage of oxygen. The measuring and storing of the purified gas were then explained, as also the development of the large type of modern gasholder, with cantilever framing originated and perfected by Mr. George Livesey. The paper concluded with a reference to an ingenious invention for dispensing with the ordinary guide framing by means of a spiral roller path formed in the wall of the tank itself.

A NEW MAIN TRUNK RAILWAY SCHEME.—A Select Committee of the House of Commons have approved of and passed a Bill authorising the construction of a new main trunk railway running across the northern part of the country from the shores of the east coast to the west, at a point on the Manchester Ship Canal. This scheme is the result of a long-felt want, on the part of coal-owners, land-owners, and traders generally, as well as Corporations and Chambers of Commerce in Lancashire, Cheshire, Derbyshire, and Lincolnshire, for a more complete railway service than they yet possess for the development of trade between seas. No fewer than 140 petitions were presented in favour of the Bill, these including petitions from the Corporations of Sheffield, Chesterfield, Macclesfield, and other public authorities. The Manchester, Sheffield, and Lincolnshire, the Midland, and the London and North-Western Railway Companies opposed, for interested reasons, based on competition, running powers, and so on; but the Committee, after a long inquiry, sanctioned the main principles of the measure. The proposed line is to be 160 miles long, and the capital asked for is 7,000,000*l.*, with the ordinary borrowing powers. In brief outline, the scheme is for the construction of a line from Warrington to Sutton-on-Sea. It is to start at the Ship Canal Docks at Warrington, and thence proceed to Alderley and Macclesfield, in Cheshire, on to Buxton and Chesterfield by way of Baslow, and from Chesterfield through Lincoln city and county to Sutton-on-Sea on the extreme east coast, which is the site of an authorised North Sea harbour and docks, the special feature of which is that those works present possibilities of the construction of a deep-water harbour which may ultimately become a very formidable rival to Great Grimsby. Mr. Elliott Cooper is the engineer of the new line.

AMALGAMATION AND REMOVAL.—Messrs. Hayward Bros. & Eckstein inform us that Mr. J. A. Willmore (trading as "Cottam & Willmore," established eighty years in Winsley-street, Oxford-street) has amalgamated his business with theirs, and that his machinery, stock, and plant will be transferred to new works erected adjoining Messrs. Hayward Bros. & Eckstein's pavement light works and foundry, Union-street, Borough, S.E. The style of the firm will remain "Hayward Brothers & Eckstein," the active partners being Mr. W. Eckstein and Mr. J. A. Willmore. Messrs. Cottam & Willmore inform us to the same effect, adding that the lease of their premises in Winsley-street will shortly expire.

EXHIBITION, FRANKFORT-ON-THE-MAIN.—The international "Electrotechnical Exhibition" is to be definitely opened on Saturday, the 16th inst. The works of completion are being carried out with energy, some 2,400 workmen being employed on the grounds. It is, however, scarcely probable that the exhibition will be ready on opening day. Even the official "Centralbl. d. Bauverw" warns would-be visitors not to visit the exhibition for some weeks after opening-day.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Laying out Large Building Estate, North Wales	Jno. Corbett, Esq. M.P.	100*l.* 30*l.* 20*l.*	May 29
School, Residence, Committee Room, and Boundary Wall, Quaker's Yard, Merthyr Tydfil	South Wales and Monmouthshire Trustee School	20 Guineas	do.
Public Baths	Shrewsbury Corp.	50*l.* and 20*l.*	June 1
*New Infirmary, Sunderland	The Committee	25*l.* and 15*l.*	June 27

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Farmhouse, Howe, Pluscarden, Elgin, N.B.	.....	A. & W. Reid	May 12
Alterations, &c. Police Station, Almaterrace	York Corporation	Alfred Creer	do.
New Stores, Seaton Burn	Cramlington District Co-op. Soc. Lim.	J. G. Crosse	do.
Hot water Heating, &c. Seaton Burn	do.	do.	do.
Cookery Centres at Board Schools	St. George (Bristol) Loc. Board	Mr. Mackay	do.
Extending Cover Factory, Red Barns, Newcastle-on-Tyne	N. E. R. Co.	Wm. Bell	May 13
Two Cottages, Hugeate, York	R. Sissons	Wm. Petch	do.
*Station Buildings, Platform, and Roofing, Wigan, &c.	I. & N. W. R. Co.	*Official*	do.
Ironwork &c. Roof	Preston Gas Co.	H. Green	do.
Steam Roller Shed and other Work	Tynemouth, U.R.S.A.	John Waters	do.
Alterations and Additions to Workmen's Hall, New Bridgar	.....	Aaron Davies & Son	do.
Methodist Chapel Cadoxton, S. Wales	.....	Phillips & Holdgate	do.
*Roadmaking and Paving Works	Fulham Vestry	W. Sykes	do.
Wesleyan Chapel, Woodacott, Thornbury, Holsworthy	Rev. R. Parker Grant	Wise & Wise	May 14
Alterations and Additions to Farmhouse, Fishacre, nr. Littlehempstone, Totnes	W. H Punchard	J. C. Tanner	do.
*New Main Sewers	Leicester Corporation	*Official*	do.
*Painting and Cleansing Works, and Repairs, South Eastern Fever Hospital	Met. Asylums Board	do.	do.
Thirty Cottages, Bwlfa Collieries, Aberdare	.....	S. Rooney	do.
Concrete Work	Leeds Working Men's Club	.....	do.
Road Metal	Staffs C.C.	J. Moncur	do.
Six Cottages, Carrington	Manchester Corp.	*Official*	May 15
*Re-building Mill Shed, &c.	Coventry Cotton Spinning Co.	Morley & Woodhouse	do.
Ten Cottages, Bovey Tracey	John S. Paddon	Samuel Segar	do.
*New School Buildings at Bruton	Sexey's Trade School Governors	G. J. Skipper	do
Five-storied Mill, Elland	H. Beaumont	C. F. L. Horsfall & Son	May 16
Street Works	Hebden Bridge Local Board	*Official*	May 18
Powder Magazine, &c. nr. Lyndhurst	Schultze Gunpowder Co.	Lemon & Blizard	do.
*Repairing Borough High-street	St. Saviours Board of Works	*Official*	May 19
*Cement Footways	Colchester U.S.A.	do.	do.
*Work at the Somerset and Bath Asylums Walls	Committee of Visitors	*Official*	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Dock Equipment Works	Preston Dock	B. Sykes	May 19
Alterations and Additions to Premises, Exeter	.....	A. H Wills	May 20
Three Iron Roofs	Belfast Corporation	Jas. Stelfox	do.
Hospital, Shell, Ballysbannon	.....	W. H. Byrne	do
*Roadmaking and Paving Works	Hammersmith Vestry	H. Mair	do.
Wood Paving	Plymouth Corp.	Geo. D. Bellamy	do.
*Enlargement of Post-office, Newport (Mon.)	Com. of H.M. Works	*Official*	do.
*Painting and Cleansing Works, and Repairs, Caterham Asylum	Met Asylums Board	do.	May 21
*New Workhouse Buildings	Hastings Union	P. H. Tree	do.
*St. Catherine's Church Institute Stores, &c, Eastwood, Notts	The Institute ..... Lunley Mill and Aldercar Co-Op. Soc.	J. A. Berrington	May 22
Villa Station-road, Grantown, N.B.	.....	Geo. Haslam	do.
*Erection, Furnishing, and Heating of School	Swansea School Board	A. & W. Reid	May 23
*Alterations to Police Station Epping	Essex County Council	T. P. Martin	do
*Storage Reservoir, Auxiliary Pumping Station, &c.	.....	*Official*	May 25
*Construction of Engine House, &c.	West Ham Council	do.	May 26
*Sewering and Roadmaking	Birkdale Local Board	Lewis Angell	do
School Buildings, Board-room, &c. near Newcastle-on-Tyne	Benwell School Board	J. H. Fairburn	June 1
Dridhall, Berwick-on-Tweed	.....	J. W. Thompson Jas. W. Thompson	June 3 No date
Making a Railway, Backhoe Colliery, near Amble	Colliery Company	.....	do.
Concrete Work for Making, Newcastle-on-Tyne	Addison Potter & Son	Thompson & Dunn	do.
New Church, Brachfa, Herefordshire	.....	P. H. L. Barker	do.
Thirteen Houses, Dunmurry, Belfast	Thos. Crawford	Jas. Ewart	do.
*Police Station at Ecclesfield	Lancaster C. C.	G. Holme	do.
Pulling down a 50 ft. Chimney and Erecting one 90 ft.	W. H. Baxter	.....	do
Alterations to Business Premises, Kirkgate, Otley, Leeds	.....	T. R. Marshall	do.
Altering Course and Covering in Barn Beck, Hunslet	Leeds Steel Wks. Lim	*Official*	do.
Cement Kilns, &c. Lower Penarth	South Wales Portland Cement & Lime Co	.....	do.
Entrance Lodge, Rheda, Creator Moor	Thos. Dixon	C. J. Ferguson	do.
Heating (Low Pressure) the Union Offices, Board Room, Waiting Halls, &c. Westbar	Sheffield Guardians	C. J. Innocent	do.
Farm Buildings, Great Stukeley and Glatton, Hunts	.....	Robt. Hutchinson	do.
Shops, Sawmills Stores, Stables, &c. Louise Pit, Stanley, Durham	South Moor Colliery Co.	.....	do.
Iron Girder Bridge, Ingram, Northumberland	.....	Hubert Laws	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
Clerk of Works	Tredegar Local Board	2*l.* 10*s.* per week	May 12
*Surveyor, Inspector of Nuisances, &c.	Ware Local Board	125*l.* &c.	May 12
*Building Inspector	Southend Local Board	.....	May 20
*Assistant City Engineer	Cape Town Corp	300*l.*	May 26

Those marked with an Asterisk (*) are advertised in this Number. *Competitions*, p. iv. *Contracts*, pp. iv. and vi. *Public Appointments*, p. xx.

CAPITAL AND LABOUR.

THE CARPENTERS' AND JOINERS' STRIKE IN LONDON.—According to the *Daily News*, the strike of the carpenters and joiners against the three London firms who have refused to accede to the men's demands for increased pay and shorter working hours is being maintained with undiminished vigour. It is stated, however, that a few men on Wednesday resumed work on a small contract which was in the hands of Messrs. Patman & Fotheringham, but which is now stated to have been taken over by a private employer, who has engaged the men on their own terms—viz., at the rate of 10d. per hour and forty-seven hours per week.——The Exchange Telegraph Company is informed that Mr. Henshaw, the secretary of the Master Builders' Association, states that all the statements in the press as to the strike are very much exaggerated. At the utmost not more than 400 men are out on strike.

THE LIVERPOOL BUILDING TRADES.—Trade rules which came into force on the 1st inst. have been signed between the Liverpool Master Builders' Association and the following operative societies:—The Operative Bricklayers' Society, increasing the rate of wages from 8d. to 8½d. per hour; and the slaters and the plasterers, increasing the rate of wages from 8d. to 8½d. per hour. In the case of the painters, Judge Collier, who acted as arbitrator, awarded an increase of wages from 7½d. to 7½d. per hour.—*Liverpool Post.*

MEETINGS.

SATURDAY, MAY 9.

Incorporated Association of Municipal and County Engineers.—Western Counties District Meeting at Cheltenham.

St. Paul's Ecclesiological Society.—Visit to Kingston Church and the Chapel of St. Mary Magdalene.

Edinburgh Architectural Association.—Visit to Newhall House, Brunstane Castle, Ravensnook Castle, and Penicuik House.

MONDAY, MAY 11.

Surveyors' Institution.—Mr. W. G. S. Rolleston on "State-created Small Holdings" 8 p.m.

Institution of Civil Engineers.—Students' Visit to the Royal Gun Factory, Woolwich. Assemble at the Royal Arsenal Gate, 2 p.m.

TUESDAY, MAY 12.

Society of Arts.—Mr. H. Arthur Kennedy on "Glass Painting." 8 p.m.

Institution of Civil Engineers.—Mr. William Langdon on "Railway-train Lighting." 8 p.m.

Birmingham Architectural Association.—(1) Election of Officers. (2) Mr. W. Salt Brassington on "Oxford and the Neighbourhood." 7.30 p.m.

Royal Society of Antiquaries of Ireland.—Meeting at Kilkenny.

WEDNESDAY, MAY 13.

Society of Arts.—Professor J. J. Hummel on "Fast and Fugitive Dyes." 8 p.m.

Civil and Mechanical Engineers' Society.—Annual Dinner, Holborn Restaurant.

Guild and School of Handicraft.—Mr. H. L. Rathbone on "Hammered Hollow Ware." 8 p.m.

THURSDAY, MAY 14.

Institution of Electrical Engineers.—(1) Discussion on Dr. J. A. Fleming's paper on "Some Effects of Alternating Current Flow in Conductors having Capacity and Self-Induction." (2) Discussion on Mr. W. H Preece's paper on "Some Points Connected with Mains for Electric Lighting." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Dundee Institute of Architecture.—Rev. J. Cooper, M.A., on "Principles of Christian Faith and Worship as applied to the Structure and Adornment of Churches." 8 p.m.

FRIDAY, MAY 15.

Royal Institution.—Professor G. D. Liveing, M.A., F.R.S., on "Crystallization." 9 p.m.

Junior Engineering Society.—Mr. H. B. Vorley on "Electrical Storage Batteries." 8 p.m.

SATURDAY, MAY 16.

Glasgow Architectural Association.—Visit to Kilbirnie Church, &c.

A WINDOW designed by Mr. C. W. Whall is on view on the 13th and 14th, from 2 to 4, at Messrs. Britten & Gilson's, 180, Union-street, Southwark, on presentation of address card. The window is destined for the Church of St. Mary, Stamford, and is part of the restoration by the late J. D. Sedding. It has been all painted by Mr. Whall's assistant under his own supervision, and direct from his life studies, and the whole retouched by himself. The colour has been arranged by sketches made previously in the actual glass.

"STABLE BUILDINGS AND STABLE FITTINGS" We have received a long letter from Mr. Byng Giraud, author of a work with the above title noticed under "Books" recently, complaining that he has been misrepresented in our review. We can only recognise one case of misrepresentation, in that we said "nearly all" the plans for private stables showed the harness-room opening out of the stable. This we find is an exaggeration which we gladly correct. There are six plans of private stables given; in three of them the harness-room is well planned; in two it opens out of the stables and in one it opens in direct contiguity to a loose-box. Instead of "nearly all," therefore, we should have said in "half" the examples given.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

5,403.—WASTE-PREVENTING APPARATUS: *J. Smeaton*—In the cistern which is the subject of this patent, a bent syphon with a tail-pipe is fixed with the suction-leg of the syphon reaching nearly to the bottom of the cistern. The supply-pipe is fitted with a controlling ball or other valve, and a second supply is introduced into the section-leg of syphon, this branch supply being controlled by a valve and stop-cock.

6,780.—SCREW EYES AND HOOKS: *G. Hemart.*—To hang up lamps or suspend anything from the ceiling, an eye-piece or hook with a screw-threaded stem made to screw into a long nut with wedge-shaped ears is used by this inventor. When a load is suspended from the eye-piece, the ears of the nut press the two halves of the split bush outwards against the sides of the hole in which the same are placed, thus increasing the hold.

7,174.—T AND OTHER SQUARES: *E. Pearson.*—One of the members forming the end of the blade has a folding hinge attached thereto, engaging with a pin or slot formed in the butt or stock of the square, so that the blade, when folded, lies flat upon and parallel to the butt. By this arrangement the square may be carried in the pocket.

8,173.—WASHING SAND: *A. T. Walker.*—The sand is washed by placing it in a conical vessel and then forcing from below a stream of water, when the impurities are caused to flow away. Mechanical details for emptying, &c., the vessels are described.

8,413.—ARTIFICIAL STONE: *J. Hartnell.*—The crushed stone, gravel, &c, are thoroughly mixed together, and the mixture is wetted with a chemical solution, the whole being thoroughly mixed into a workable state, the superfluous moisture being gradually patted to the surface. The mass is then run into moulds

9,321.—JOINERY: *P. P. de la Sala.*—Instead of glue or nails, screws, &c., a system of "isomorphical" connexions are devised, all the pieces or blocks of the structure being provided with projections or recesses in such a manner that every projection fits into its corresponding counterpart on the piece or block.

9,365.—PLASTIC MOULDING MATERIAL: *H. H. Lake*—This method enables gypsum to be mixed with other substances, chiefly glue and lime, the moulding material thus obtained being plastic, while it hardens rapidly, and is strong enough for most practical purposes.

9,369.—WATER CLOSETS: *W. B. Moore.*—An annular channel round the upper lip of the pan has outlets which discharge streams of water along the internal surface of the pan, and a channel descending to the bottom of the pan, and a contracted opening directs a current of water towards an outlet from the pan, sloping up to a syphon bend, thence leading to a drain.

NEW APPLICATIONS FOR PATENTS.

April 20.—6,770, D. Everett and T. Claridge, Pigments.—6,778, U. Sipos, Stove.—6,797, E. Wrigelin, Drying Bricks, &c.—6,798, A. Boult, Kilns, &c.—6,799, W. Thompson, Chimney Cowls, &c.—6,810, J. Singer and A. Barnes, Manufacture of White Lead.

April 21.—6,821, R. Pye, Heating, Cooling, and Ventilating Buildings. &c.—5,822, R. Gardner, Sash Balances.—6,833, J. Morley & Co., Flush-out Cisterns for Water-closets.—6,839, J. Fairbank, Gasfittings.—6,875, M. Logan, Drain for Stable Stalls.—6,884, E. Featherstone, Fastener or Bolt.—6,887, J. Peake, Kilns. —6,901. J. Forster, Door Knobs.

April 22.—6,907, A. Mackett, Mitre-cutting Machines. —6,922, A. Damp, Water-closet Cisterns.—6,924, E. Bilton, Glazing Pottery, &c.—6,928, F. Williamson, Sash Fastener.—6,937, G. Haynes, Combination of Materials for Paving, Coping, &c.—6,958, W. Stocker, Suspenders for Scaffoldings.—6,971, L. Lenègre, Safety Fastenings for Doors.—6,981, W. Horn, Roofing Paper.

April 23.—6,995, C Hollier, Self-acting, Frost-resisting System for Gas and Water-pipes.—7,016, G. Downing, Ventilator.—7,043, S. Snell, Materials for Ornamental Work and Mouldings.

April 24.—7,077, H. King, Stay-bar for Casements and other Hinged Lights and Doors.—7,081, G. Williams & T. Gregory, Sash and Sash-frames for Windows.—7,105, J. Johnson, Cutting Stone.

April 25.—7,122, J. Richmond, Fireplaces.—7,125, J. Kennard, Emergency Bolts for Doors of Theatres, &c.—7,138, E. Wehrli, Facings or Covering Plates or Slabs for Architectural Purposes.—7,145, W. Allen, Automatic Basin with Revolving Action for Flushing W.C.'s, Drains, &c.—7,184, W. Horn, Artificial Stone.—7,190, E. Thomlinson, Manufacturer of Cement.—7,194, E. Jones, Window Sash Fasteners.

PROVISIONAL SPECIFICATIONS ACCEPTED.

2,523, J. Holdsworth, Warming Air for Heating Buildings, rooms, &c.—3,408, F. Wright and F. Woolstone, Disinfecting and Deodorising the Pans, &c., of Water-closets.—3,877, C. Green, Window Ventilation of Dwelling-houses, &c.—4,161, T. Kemp, Testing drains.—4,435, G. Winship, Rotary Drain and Sewer Cleaner.—4,519, W. Clark, Glazing Horticultural Buildings, &c.—4,819, J. Southall, Flushing Cisterns.—5,041, H. Leigh, Water-closets.—5,423, T. Smith, Sash Fastener.—5,497, W. Horn, Wall and Ceiling Polish.—5,707, H. Fairbrother and H. Damon, Bending Wire Wall-ties.—5,977, J. Robson, Preservative Coatings for Iron or other Structures.—5,985, J. Reap, A Tool for Cutting Wood to Mitre or other Angles.—6,011, A Lundberg, Ceiling Roses for Electric Lighting.—6,116, C. Murrell, Excluding Draughts from Doors.—6,183, J. Drayton and J. Wilkins, Window Wedge to Prevent Rattling of Sashes.—6,357, W. Gibson, Kilns for Biscuiting and Burning Glazed and Enamelled Clay Goods.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

9,440, H. Schlund, Hinges.—9,718, J. Vassaux, Reciprocating Saw-frames or Machines.—9,989, W. Wood, Die or Mouthpiece for Brick-making Machines.—10,027, H. Shanks, Water-closets.—2,288, J. Bertlett, Ventilating Cowls.—4,541, W. Gage, Handle for Chisels.—4,962, A. Goerke, Buildings and Structures.—5,224, L. Sagendorph, Metallic Facing for Buildings.—5,309, H. Bruck, Imitation of Marble.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 27.—By *Fuller, Moon, & Fuller:* F. land, 81 acres, London-rd., Croydon, 1,550*l.*; 37 and 39, Este-rd., Clapham, u.t. 60 yrs., g.r. 8*l.*, 260*l.*—By *Messrs. Aldridge:* A plot of freehold land, Frant-rd., Thornton Heath, 285*l.*—By *Walker & Runtz:* 1 and 2, Ladbroke Grove-rd., Notting Hill, u.t. 78 yrs , g.r. 10*l.*, 435*l.*—By *Field & Sons:* 10, Store-st., Bloomsbury, u.t. 10 yrs., g.r. 17*l.*, 75*l.*, 610*l.*; 83 and 84, Upper Ground-st., Blackfriars, r., 59*l.* 16*s.*, 420*l.*; 15 to 23 (odd), Basing-rd., Peckham, u.t. 39 yrs., g.r. 20*l.*, r. 110*l.* 10*s.*, 600*l.*—By *P. Hodson:* 4, Elwood-st. Highbury, u.t. 55 yrs., g.r. 6*l.* 6*s.*, 235*l.*; 60, 160, Stroud Green-rd., u.t. 72 yrs., g.r. 8*l.*, r. 45*l.*, 220*l.*; 1, Lower Lawn-rd., Hampstead, u.t. 60 yrs., r. 10*l.*, r. 40*l.*, 210*l.*; 15, Queen's ter., St. John's Wood, u.t. 29 yrs., g.r. 19*l.*, r. 75*l.*, 450*l.*; 10, Lincoln-lane, Willesden-lane, u.t. 68 yrs , g.r. 4*l.* 13*s.*, 105*l.*; 20, Bedford-ter., Finsbury-pk., and 2A, Moray-rd., f., 455*l.*

APRIL 28.—By *Hards & Bradly:* A plot of freehold land, Beaconsfield-rd., Lewisham, 160*l.*—By *Farber, Price, & Farber:* f.g.r. of 54*l.* 14*s.*, u.t. 21 yrs., at g.r. 7*l.*, Camden-town, 420*l.*; f.g.r. of 15*l.*, u.t. 21 yrs., at g.r. 1*l.*, 165*l.*; f.g.r. of 52*l.*, with reversion in 13 yrs., Finsbury, 1,340*l.*; f.g.r of 45*l.*, with reversion in 17 yrs., Commercial-rd., 1,860*l.*; 9 to 12, China-walk, Lambeth, r. 125*l.* 2*s.*, 760*l.*; 11, Westbourne-st., Chelsea, u.t. 30 yrs., g.r. 8*l.*, r. 37*l.*, 420*l.*; 4, Denmark-st., Soho, f., 1,600*l.*; 4, Highbury-ter., Highbury, f., r. 80*l.*, 1,000*l.*—*By F. Jolly & Co.* (at Birmingham): 6 and 7, Highgate-, Birmingham, f., r. 41*l.*, 700*l.*

APRIL 29 —By *G. A. Kendall:* 55, Upland-rd., Dulwich, u.t. 88 yrs., g.r 7*l.*, 300*l.*—By *Mansell & Rowe:* 157, Staggerston-rd., Dalston, f., r. 29*l.*, 350*l.*; 1, 2, and 5, Pinnacle-pl., Stanmore, f., r. 50*l.* 11*s.*, 240*l.*—By *W. & F. Naughton:* A plot of freehold land, 1a. 2r. 30p., Walthamstow, 1,585*l.*—By *E. & S. Smith:* 176, Greenwich-, Bethnal-gr., f., r. 25*l.*, 420*l.*; 178, Green-st., and 1, Hart-st., f., r. 40*l.*, 95*l.*

APRIL 30.—By *J. A. Jones:* 9, Woburn-buildings, Euston-rd., u.t. 27 yrs., g.r. 21*l.*, r. 80*l.* 12*s.*, 145*l.*—By *W. Saffell:* the residence "Windermere," Woodberry Down, u.t. 64 yrs., g.r. 29*l.* 9*s.*, 2,110*l.*; 7, Brunswick-sq., Camberwell, u.t. 40 yrs., g.r. 11*l.*, r. 26*l.*, 255*l.*—By *G. Hillesen:* 11 to 21 (odd), Abercrombie-st., Battersea, u.t. 55 yrs., g.r. 27*l.*, r. 167*l.* 6*s.*, 900*l.*—By *Humphreys, Ware, & Co.:* 61, London-st., Greenwich, f., r. 50*l.*, 750*l.*—*Newbon & Co.*—63 to 69 (odd), Upper North-st., Poplar, u.t. 57 yrs., g.r. 20*l.*, r., 162*l.*, 1,500*l.*; 3, Cornwallis Cottages, Barnsbury, u.t. 55 yrs., g.r., 5*l.* 5*s.*, r. 3, Sheen-grove, u.t. 45 yrs., g.r. 6*l.*, r. 30*l.*, 255*l.*—By *G. Mitford-rd., u.t. 43 yrs., g.r. 9*l.*, r. 44*l.*, 325*l.*; 26, Junction-st., Kingsland-cross, u.t. 63 yrs., g.r. 5*l.*, r. 55*l.* 18*s.*, 405*l.*; 101, Sandringham-rd., Dalston, u.t. 70 yrs, g.r. 6*l.* 10*s.*, 265*l.*; 144, Allcroft-rd., Kentish Town, u.t. 73 yrs., g.r. 6*l.*, 310*l.*; *Cooper & Goulding:* 5 & 7, Elphinstone-st., Highbury, r. 69*l.* 12*s.*, 625*l.*; No. 675, Old Kent-rd., u.t. 55 yrs., r. 77*l.* 1*s.* r. 40*l.*, 305*l.*; 1 to 7 (odd), Ruby-st., u.t. 55 yrs., g.r. 20*l.* 10*s.*, r. 132*l.* 12*s.*, 735*l.*; 52, 62, 66, and 68, Ruby-st., u.t. 55 yrs., g.r. 35*l.* 17*s.* 6*d.*, r. 9*s.*, 855*l.*; 9 to 15, Vaughan-pl., u.t. 55 yrs., g.r. 38*s.*, r. 157*l.* 6*s.*, 63 *l.*; 1, 2, 3, 7 to 14, Bradshaw-st., u.t. 55 yrs., g.r. 37*l.* 19*s.*, r. 248*l.* 8*s.*, 1,050*l.*; 9 to 13, Alexander-st., u.t. 55 yrs., g.r. 17*l.* 15*s.*, r. 118*l.* 6*s.*, 635*l.*

MAY 1.—By *Baker & Sons:* F.g.r. of 585*l.*, with reversion in 79 yrs., Ludgate-hill, 13,300*l.*; f.g.r. of 525*l.*, with reversion in 77 yrs., Arthur-st. East, City, 11,000*l.*; f.g.r. of 450*l.*, with reversion in 77 yrs., St. Mary-at-Hill, 10,500*l.*; "Old House Farm," near Broxbourne, 132a. 1r. 3p., f., 6,000*l.*—By *Randall, Beard, & Baker:* 23, 27, and 29, Lichfield-grove, Finchley, u.t. 75 yrs., g.r. 18*l.*, r. 100*l.*, 650*l.*—By *Foster & Cranfield:* 12, Montague-pl., Russell-sq., u.t. 10 yrs., g.r. 20*l.*, r. 160*l.*, 670*l.*; 23, Parliament Hill-rd., Hampstead, u.t. 86 yrs., g.r. 9*l.*, r. 70*l.*, 700*l.*; 46, Acacia-rd., St. John's Wood, u.t. 43 yrs., g.r. 9*l.*, r. 50*l.*, 450*l.*—By *W. J. Newell:* f.g.r. of 230*l.*, u.t. 63 yrs., g.r. 120*l.*, Old Kent-rd., 1,995*l.*; f.g.r. of 11*l.*, u.t 62 yrs., g.r. 7*l.* 4*s.*, Peckham, 125*l.*; 10 and 12, Cressingham-rd., Lewisham, u.t. 71 yrs., g.r. 8*l.*, r. 62*l.*, 515*l.*; 18 and 20, Cressingham-rd., u.t. 71 yrs., g.r. 8*l.* 18*s.*, r. 62*l.*, 535*l.*

[Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS

TIMBER.		
Greenheart, B.G.		
ton	6/10 6	7/15 0
Teak, E.I., load	8.10 0	14 0 0
Sequoia, U.S.A., cu.	2 2	3 0
Ash, Canada load	2 10 0	4 5 0
Birch, do.	2 5 0	4 5 0
Elm, do.	3 10 0	4 15 0
Fir, Dantzic, &c.	2 1 0	3 15 0
Oak, do.	2 13 0	4 10 0
Canada	4/7/6	6/10/0
Pine, Canada red	2/10 0	3 10 0
Do. yellow	2 0 0	5 10 0
Lath, Dutch, fath	5 0 0	6 0 0
Do. Petersburg	5 0 0	7 0 0
Deals, Finland,		
2nd & best all 100	7 0 0	10 0 0
Do. 4th & 3rd...	7 0 0	8 0 0
Do. Riga	6/0/0	7/10/0
St. Petersburg,		
1st yellow ...	8/10/0	14/0/0
Do. 2nd yellow	8 0 0	9 0 0
Do. white ...	6 10 0	10 0 0
Swedish ...	6 10 0	15 0 0
White Sea ...	8 10 0	16 10 0
Canad. Pine 1st	15 0 0	24 0 0
Do. do. 2nd....	9 0 0	15 10 0
Do. do. 3rd, &c.	6 10 0	10 0 0
Do. Spruce, 1st	8 10 0	10 10 0
Do. do. 3rd &		
2nd ...	6 0 0	7/10 0
New Brunswick	8 0 0	7 0 0
Battens, all kinds	3/10 0	18.10 0
Flooring Boards,		
sq., 1 in. prep.		
1st	0/0/0	0/14/0
Do. 2nd.	0 9 0	0 10 6
Other qualities	0 5 0	0 9 0
Cedar, Cuba ...ft.	/4	/4½
Honduras, &c.	/4	/4½
Mah. gany, Cuba,	/4½	/6½
St. Domingo,		
cargo av	/4½	/6½
Mexican do. do	/4½	/5½
Tobasco do. do	/5½	/6
Honduras do...	/5½	/6½
Box, Turkey ton	4.0 0	13 0 0
Rose, Rio.....	10.0 0	20.0 0
Bahia	8/0 0	18/0/0

TIMBER (*continued*).		
Satin, St. Do-		
mingo ....ft.	0/0/10	0/1/3
Porto Rico ...	0 0 0	0 1 6
Walnut, Italian .	0 0 3½	0 0 7
METALS.		
IRON—Bar, Welsh,		
in London...ton	6/5/0	6/15/0
Do. at works		
in Wales	5/15/0	6/5/0
Do. Staffordshire,		
in London ...	6 5 0	7/0/0
Common—British,		
case as it comes	5/0/0	5/7/0
Best selected .	5/10 0	6/0/0
Sheets, strong .	6/0/0	6/5/0
Hoops	5/2 10 0	6/0/0
YELLOW METAL..	0/0 6	0/0/6½
LEAD — Pig,		
Spanish ....ton	12/12/6	0/0/0
English, com.		
brands	12 12 6	12 15 0
Sheet, English,		
3lbs. per sq. ft.		
and upwards ..	14 10 0	0/0/0
Pipe	15 0 0	0 0 0
ZINC — English		
sheet ..... ton	26 5 0	0 0 0
Vieille Mon-		
tagne	26 15 0	0 0 0
TIN—Straits ..	96 10 0	0 0 0
Australian ...	90 15 0	0 0 0
English Ingots	94 15 0	0 0 0
OILS		
Linseed ..... ton	22 0 0	22 10 0
Cocoanut, Cochin	35 10 0	0 0 0
Do. Ceylon	32 10 0	0 0 0
Palm, Lagos	26 0 0	0 0 0
Rapeseed, English		
pale	31 10 0	0 0 0
Do. brown	30 0 0	0 0 0
Cottonseed ref...	22 10 0	0 0 0
Olive	51 0 0	54 0 0
Lubricating, U.S.	4 0 0	7 0 0
Do. refined	7 10 0	12 0 0
TAR — Stockholm		
barrel	1/1/6	1/2/0
Archangel	0/13/6	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BARNES (Surrey).—For the erection of the new church of St. Michael and All Angels, with house of four. Mr. C. Ilches, architect, 27, Queen-street, City —

R. Avis & Co	£6,420
Lee & Co	5,885
Dove Bros.	5,675
A. Soe	5,575
E. Lawrence & Sons	5,351
Higgs & Hill	5,320
T. H. Adamson & Sons	£5,272
J. M. Mee & Son	5,266
Perry & Co	5,200
T. Greaves & Co	5,287
Balham Bros	4,998

BEDFORD.—For erecting a house in Kempston-road, Bedford, for Mr. Joyce. Mr. F. T. Mercer, architect, Mill street, Bedford.

Webster & Cunnam	£910
French & Ellwood	845
J. Warton	610
Melcombe Bros.	562
Geo. Harrison.	£487
John P. White	475
C. E. Fathers	465

BEXLEY.—For rebuilding "Marl House," for Mr. R. H. Rogers. Mr. Frederick W. Ledger, architect, 4, Lombard-court, E.C.

Woodward & C	£2,781
J. Burrowes and	2,695
Nye & Sons	2,655
J. & C. Bowyer	2,595
R. & J. Butler	2,535
R. A. Lowe	£2,475
B. L. Norrington	2,390
Nash & Son	2,390
Rowlands'	2,389
Walter Bros.	2,215
E. West	2,205

BOVEY TRACEY (Devon).—For the erection of an entrance lodge, at Dunsland, for Greenhill Hughes, C.B. Mr. Samuel Segar, architect, Union street, Newton Abbot.

F. Barrow	£224
Kaiser	222
F. Ball	220
W. Mills	220
Wills Bros.	£199 17
Collings	199 0
L. Bearne, Newton Abbot*	198 0

BRENTWOOD.—For new shop, &c., for Messrs. Wilson. Mr. E. N. Cubitt, architect:—

Everett & Son	£2,500
Cockrell	2,485
Whitehead	2,475
Roger & Bean	2,397
A. Ansell	2,310
Chout & Son	£2,247
H. Potter	2,217
A. Bean	2,190
Wyatt Bros.	2,175
E. West	2,035

CARDIFF.—For rebuilding the "Borough Arms," St. Mary street, for Mr. Jas. Howell. Mr. Alf. P. Jones, architect, 27, Park street, Cardiff. Quantities by architect

D. J. Davies	£5,250
Wallace	5,202
Turner & Sons	5,088
D. Davies	4,870
Burris & Co	4,796
H. Davies	4,778
Jones Bros	£4,670
Griffiths	4,540
Jas. Thomas	4,490
Shepherd & Son*	4,350

* Accepted.

[Al. of Cardiff.]

CLACTON-ON-SEA (Essex).—For erecting nine cottages, with drainage, fences and footways, at Middle Green, for Dr. J. C. Barnett, M.D. Mr. Alfred Broad, architect, 27, Dingwall road, Croydon. Quantities by the architect —

Bacon	£2,274
Orlent	2,078
S. Pettitt	2,020
Everett & Son, Colchester*	£2,250
Angell	2,14[illegible]
West	2,187

* Accepted.

GREAT YARMOUTH.—For new premises, Howard-street, for Messrs. Gurneys & Co. Quantities supplied. Messrs. Bottle & Olley, architects, Great Yarmouth —

Cockrell & Sons	£22,211 10 0
J. Leggett	21,750 0 0
H. T. Cooper	21,057 13 8
B. Springall	20,960 0 0
R. Davy	20,500 0 0
G. T. Flaxman	£21,890 0 0
Grimble & Watts ..	21,885 0 0
G. W. Beech, Yar-	
mouth*	21,885 0 0

* Accepted.

GREAT YARMOUTH.—For alterations at the Royal Aquarium, Great Yarmouth. No quantities. Messrs. Bottle & Olley, architects, Great Yarmouth.

L. East	£443 15 0
Grimble & Watts ..	427 0 0
H. Dexy	424 0 0
L. Rowe	420 0 0
G. W. Beech..	416 0 0
H. Nutman	£413 0 0
J. F. W. Bray	390 0 0
A. W. Newman, Yar-	
mouth*	385 0 0

* Accepted.

HAMPTON.—For the construction of a retaining wall and iron fence, near the Churchyard, for the Local Board. Mr. John Kemp, Surveyor, Local Board Offices, Hampton.

G. Simmons	£[illegible] 11
G. Keats	158 10
John Wright, Hampton*	£136 15

* Accepted.

HEREFORDSHIRE.—For alterations and improvements to Sutton Hall, for Mr. G. W. Marshall. Mr. H. Brunwicke Langston, architect, 9, Great James-street, Bedford row, London. Quantities not supplied:

	Allowance for Old Materials.
H. Welsh	£200 0 0
W. Bowers & Co.	2,450 0 0
H. Millward, Leominster*	1,686 10 0
	£25 0 0
	27 0 0
	190 0 0

* Accepted.

IPSWICH.—For widening "Burrell Bridge," for the Committee. Messrs. E. Buckham & H. Miller, jun., joint engineers, Exchange-chambers, Ipswich.

Grimwood	£2,543
Bennett	2,470
Girling	2,319
Parker	2,221
Double	£1,980
Peth. Lemmington*	1,960
Hipwell	1,795

* Accepted.

KETTERING.—For the erection of school buildings, board room, out-offices, &c., Stamford road, Kettering, for the School Board of Kettering. Messrs. Gotch & Saunders, architects, Lincoln and Kettering. Quantities by the architects.

W. Hinson	£11,403
J. T. Wakefield	11,121
F. Barlow	10,990
G. Henson	10,900
C. & F. Henson	10,500
J. Fishburn	£10,190
G. W. Hinson	10,100
E. Barlow	9,998
A. Barlow	9,980
W. J. Payne, Kettering*	9,833 15

* Accepted.

LINCOLN.—For additions to the head office of the Midland Counties Insurance Company, Silver street, Lincoln. Mr. W. Watkins, architect. Quantities supplied by architect.

W. Wright & Sons	£[illegible]
J. Bellamy	[illegible]
Walter & Heusman	4,[illegible]
M. Otter	4,[illegible]
Pattinson	3,[illegible]
W. Wright & Son, Lincoln	£3,760
(accepted)	3,[illegible]

LINCOLN.—For alterations and additions to the Lincoln County Hospital. Mr. W. Watkins, architect. Quantities by the architect.

J. R. Harrison	£4,[illegible]
Walter & Heusman	4,[illegible]
M. Otter	4,[illegible]
Pattinson	3,[illegible]
W. Wright & Son, Lincoln	£3,760
(accepted)	3,[illegible]

LONDON.—For making up and paving the following roads for the Vestry of Fulham. Mr. W. Sykes, New Streets Surveyor —

Name of Contractor.	Waldemar-avenue.			Hartismere Road.				Marmefield-road.			
	R	V.	V.	L	R	Y	Y	I	R	V	V.	L
	£	s.	£	£	£	£	£	£	£	£	£	£
Nowell & Robson	1,[illegible]	7[illegible]			75	15[illegible]			41[illegible]	6	—	
F. Adkins	1,[illegible]	[illegible]	14		722	10[illegible]	207	284	451	58	9.8	192
G. Bell	81[illegible]				78				427			
James & Wimpey	745	57[illegible]	554	415	571	[illegible]	158	284	434	237	223	261
Imperial Stone Co.	—		546		—		240		—		182	

R. All work except the actual paving. Y. York stone paving.
V. Victoria stone paving. I. Imperial stone paving.

LONDON.—For alterations and additions to the "Morpeth Castle" Victoria Park, for Mr. J. North. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within.

G. Neal	£8[illegible]
Todd	8[illegible]
Courtney & Fairbairn ...	8[illegible]
Wm. Kerr Bros.	£77[illegible]
Edwards & Mc'lway* ...	71[illegible]

* Accepted.

LONDON.—For alterations to water-closets and other fittings at the Eastern Fever Hospital, Homerton, for the Metropolitan Asylums Board. Mr. Keith D. Young, architect.

Sanitary and Domestic Engineering Company	£[illegible] 0
R. & W. Pratt	4[illegible] 0
Stevens Bros.	4[illegible] 0
G. A. & H. Wall & Co. ...	4[illegible] 1
J. Frampton	4[illegible] 0
Vigor & Co.	4[illegible] 0
W. Kerr Bros.	£[illegible] 0
Trunk, Cook, Stokes, & Co.	3[illegible] 0
E. Beattie, Ltd.	[illegible] 0
Victoria street, S.W.* .	296 3

* Accepted

LONDON.—For the erection of a branch Bank at High-street, Peckham, for the Imperial Bank, Limited. Mr. Edwin T. Hall, Lothbury, E.C. Mr. Edwin T. Hall, architect, 87, Moorgate street, E.C.

Longdale & Hallett	£6,[illegible]
Mitchell	6,[illegible]
Colls & Son	6,[illegible]
Foster & Dickerson	6,[illegible]
Marriage	5,[illegible]
Parker*	5,6[illegible]

* Accepted.

Longdale & Hallett (accepted, on schedule of prices).

LONDON.—For re-planning and re-fitting the Imperial Bank, Lothbury, E.C. Mr. Edwin T. Hall, architect, 87, Moorgate street, E.C.

Longdale & Hallett	£[illegible]
Colls & Son	[illegible]
Foster & Dickerson	[illegible]
Marriage	[illegible]
Parker*	[illegible]

* Accepted.

LONDON.—For the erection of shop over forecourt, No. 786, Old Kentroad. For Mr. W. J. Glover. Mr. E. Crosse, architect, 32, Berners-street, W.

A. E. W. Gardner	£145
J. Chatsley	147
Bastable	£114 9
Rasch (accepted)..	109 0

LONDON.—For demolition &c., to 26, Old Broad-street, for the Securities Insurance Company, Limited. Mr. Herbert Knight, architect, 129, Chancery-lane.

W. Cubley & Son (accepted)	£230 0 0

LONDON.—For erecting eight houses at Larkhare-road, Lower Sydenham, for Mr. Jas. Bell. Mr. Jas. Tolley, jun., architect, 66, Cornhill, E.C.

Bastable	£[illegible]
Wadling & Co.	[illegible]
Capel	£1,184

LONDON.—For sundry alterations, &c., at the "Commercial Tavern" (exclusive of gas-fitters' and pewterers' work), Pennyfields, West India Dock-road, for Mr. C. F. J. Barker. Mr. Albert E. Pridmore, architect, 2, Broad-street Buildings, E.C.:—
Little & Senecal ..... £275 0 0 | Taylor & Son £151 0 0
Lundy & Co ..... 154 18 6 | W. Simms (accepted) 149 0 0

LONDON.—For mahogany bar fittings to the Mansfield Hotel, Mansfield-road, for Mr. J. Richard Davies. Mr. Albert E. Pridmore, architect, 2, Broad-street Buildings, E.C.
Lundy & Co, Shepherd's bush*
* Accepted at schedule of prices, exclusive of pewterers' and gas-fitters' work.

LONDON.—For alterations at Prince's Hall, Piccadilly, under the regulations of the London County Council. Mr. Walter Emden, architect, 105-106, Strand. Quantities by Messrs. Evans & Deacon, 1, Adelaide-street:—
W. Laughton ..... £1,567 | H. Roffey £1,300
Holliday & Greenwood .. 1,487 | H. & E. Lea 1,250

LONDON.—For range of nine shops with stabling, at Lee road, Blackheath. Mr. Thos. Dunwiddy, architect:—

	Extra for Seyssel Asphalte.
S. J. Jerrard £8,983	—
H. L. Holloway 8,753	£125 0
Kennard Bros 7,900	98 15
T. D. Long 7,780	174 0

LONDON.—For additions and alterations to premises, Nos. 2 4, and 6, Wood-street, and Horse and Groom yard, Wood street, Westminster, S.W., for Messrs. George Nicholls & Co. Mr. Thomas Newell, architect, 5, York Buildings, Adelphi, W.C. Quantities by Messrs. Young & Brown, 3, Henrietta-street, Covent-garden, W.C.:
John Foster ..... £1,959 | Stimpson & Co £895
Geo. Crosier ..... 1,044 | Wm. Goodman* 892
C. P. Kenrick ..... 979 | * Accepted.

LONDON.—For the erection of warehouse, Tooley-street, Bermondsey, S.E., for Mr. Evitt. Mr. E. B. Allison, architect, 7a, Lawrence Pountney-hill, E.C.:
Williams ..... £1,127 | Stephens £680
Balaam Bros. ..... 1,099 | Bullers 945
Young & Lonsdale ..... 1,045 |

MANCHESTER.—Accepted for the erection of the nave of a church at Heap Bridge, near Heywood, for the Rev. A. Redman. Mr. John Lowe, architect, 17, St. Ann's-square, Manchester:—
Samuel Barker, Heywood £2,080 0 0

MANCHESTER.—For the erection of St. James Rectory, Moss Side, Manchester. Mr. John Lowe, architect
William Thorpe (accepted) £1,367 10 0

OATLANDS PARK.—For residence, &c., for Mr. Robert Engledue. Mr. H. L. Hill, architect. Quantities by Mr. E. A. Jackson.
Turtle & Appleton ..... £4,785 | Martin, Wells, & Co £4,250
J. Smith ..... 4,576 | Wheatley & Sons 4,220
G. Burrage ..... 4,567 | Brown 4,150
E. J. Ingram ..... 4,232 | B. Ingram & Co., Hersham 4,100

PELAW (co. Durham).—For erecting branch rectories at Pelaw, for the Building Co-operative Society. Mr. J. H. Morton, architect:—
J. Yeates ..... £2,606 2 5 | W. Foster £1,801 7 4
Cooper & Henderson ..... 1,421 14 0 | H. Stevens 1,750 0 0
J. Storer & Son ..... 1,416 3 0 | J. H. Walton 1,448 11 2
R. Allison, Whitburn* ..... 1,340 15 0 |
* Accepted.

SOUTHALL (Middlesex).—For new house, Avenue-road, Southall, Middlesex, for Mr. George Wesbrin. Mr. Thos. Newell, architect, 5, York-buildings, Adelphi, W.C.
Hall, Uxbridge ..... £766 | Kearley, Uxbridge £672
Gibson, Southall ..... 672 | A. & B. Hanson, Southall* .. 660
* Accepted.

SOUTHSEA (Essex).—For the erection of villa-residences for Mr. J. Ward. Mr. Ed. Wright, architect:—
A. Anse l £1,275 0 0
F. Dupont, Colchester (accepted) 1,205 0 0

SOUTH SHIELDS.—For alterations and addition to lodge at the Union Workhouse, West Harton, for the Guardians. Mr. J. H. Morton, architect, Kingstreet, South Shields:—
R. Summerbell ..... £169 0 | R. Goodwin & Sons, ... 146 10 | R. Allison ..... South Shields (accepted) £144 10
[Architect's estimate ..... £150 0 0]

SOUTH SHIELDS.—For the erection of St. Aidan's Vicarage, for the Parish of St. Aidan, South Shields. Mr. J. H. Morton, architect, South Shields:—
Tyzo & Graham .... £1,857 11 0 | R. Goodwin & Son .. £1,780 0 0
Middlemiss Bros..... 1,841 0 0 | J. Elliott 1,650 0 0
D. Lowes & Co ..... 1,805 13 10 | R. Allison 1,750 10 0

STONEY STRATFORD.—For building storage tank, laying cast iron mains, erecting stand pipes, &c., at Deanshanger, for the Potterspury Union Rural Sanitary Authority. Messrs. John Ingman & Shaw, surveyors, George-row, Northampton. Quantities by the surveyors:—
Hipwell ..... £998 10 | Marsh £675
Bailey & Co ..... 776 10 | Wingrove, Northampton* .. 653
Wilson & Roberts ..... 688 0 | * Accepted.

WEST HAM.—For the repair of beam engines and pumps at the sewage pumping stations, Canning Town and Silvertown, for the Corporation of West Ham. Mr. Lewis Angell, Borough Engineer, Town-hall, Stratford:—
Jno. Stewart & Son £1,744 0 0
A. W. Robertson & Co., Caston House (accepted) 1,406 10 0

WEST HAM.—For the construction of about 3,791 lineal yards of brick-lined concrete and stoneware-pipe sewers, 4 ft. 6 in. and 18 in. diameter respectively, also one oval sewer, 4 ft. by 2 ft., together with a bellmouth chamber, forty-nine manholes, and overflows and connexions with existing sewers, situate in Beckton-road, Freemasons road, and Prince Regent-street, in the County Borough of West Ham, Essex, for the Corporation. Mr. Lewis Angell, Borough Engineer, Town-hall, Stratford:—
Jno Neave ..... £15,744 0 0 | Cooke & Co., Batter-
Thos. Adams ..... 15,261 15 4 | sea* £13,379 0 0
Perry & Co ..... 14,950 0 0 | G. Bell 13,218 0 0
J. Jackson ..... 13,700 0 0 |
* Accepted.

Bath, Camberwell-green.—In the list of tenders for this building, published in our last, for "Golding, £24,634," read "Gould & Brand," &c. The mistake was not ours.

Fittings at London & Westminster Bank, High-street, Kensington.—In this list of tenders, published in our last, for "Dunn & Cadman" read "Drew & Cadman." The mistake was due to the bad writing of the sender of the list.

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TO CORRESPONDENTS.

Building Engineer (Letter not very intelligible in detail, but the subject is an important one and shall have consideration).—J. S. C.—M. M'G.—W. H.—A. J. G.—A. E. R.—T. N.—R. C.—D. J. M.—Y. and L.—F. B. C. S.—C. T.—M. H. (too small).—H. A. (too late for this week).—G. M. (ditto).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses

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The Builder.

VOL. LX. No. 2319. SATURDAY, MAY 16, 1891.

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Proposed Bungalow House, Surrey.—Mr. R. A. Briggs, Architect ..... *Single-Page Photo-Litho.*
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The Berlin Art Exhibition.

THE German mind is nothing if not logical. The International Art Exhibition now open at Berlin has therefore a logical basis. The Government of Prussia and of course the people of Berlin desire that this city shall be, if possible, to united Germany what Paris is to France, that it shall be, not only the chief town of Prussia, but the metropolis of Germany. Stirred by this laudable ambition they are determined to spare no effort to realise their desire. Now, if the people of the various States forming the German empire, who have been wont to regard Dresden, Munich, Stuttgart, and other towns as their capitals, are to be weaned from their former ideas and yield allegiance to the supremacy of Berlin, it is evident that they must be induced to visit that city, and so become impressed by all the evidences of superiority with which the Berliners are endeavouring to hall-mark their town. To furnish an inducement for such visits, annual exhibitions of general interest are held in what is called the Landes-Ausstellungs Park, a prettily-laid-out garden, of considerable extent, situated in the Moabit quarter, and including a series of lightly-constructed exhibition buildings of iron and glass, in which the displays are located. The park is the property of the Government, who let out the premises on hire to any persons or societies who may wish to speculate in exhibitions.

This year the Society of Berlin Artists, Verein Berliner Künstler, assisted by subsidies from the Government, the Emperor, and others, have organised the present exhibition. As the control of the Society is, like that of our own Royal Academy, practically in the hands of the painters in oil, it is hardly surprising that oil-painting, as in the Academy, swamps the work of sculptors, architects, engravers, and water-colour painters. A really fine collection of European oil-painting, that of France excepted, save so far as the predominant influence of France is concerned, has been gathered together in the present exhibition.

Naturally enough, German work predominates in quantity, compared, that is, with the work of any other individual country, and of German work that of Berlin also naturally enough occupies the greatest space. All the world knows that political feeling has caused the abstention of France, but it is doubtful if that abstention is very deeply regretted in the innermost thoughts of the rulers of Berlin. The provincial German visitor is far more likely to obtain an impression of the superiority of Germany in general, and of Berlin in particular, from the present exhibition, than if France and Paris were fairly represented.

Sculpture, engraving, water-colour, and architecture, as we have noted above, take quite a secondary place, both as regards quantity and quality, to that held by oil-painting. The architectural portion of the Exhibition in particular is somewhat disappointing. Although the large size of many of the drawings causes them to occupy a slightly greater space, perhaps, than is given in the architectural room of our own Royal Academy, the number of the drawings is hardly more than we see there annually. To imagine that this is an adequate representation of even German architectural art is ludicrous to a degree, and still more absurd is it to suppose it an international architectural exhibition. With England, at present at any rate, America, France, and Austria unrepresented in architectural art, the inadequacy of this part of the collection is self-evident.

The Italians and the French have shown us that an architectural exhibition can be made both interesting and international, but the present example in Berlin can scarcely claim to be to the fullest extent either one or the other. The older members of the architectural profession in Germany are understood to be averse to exhibiting their work, and although Messrs. Ende & Böckmann, who are certainly *primi inter pares* amongst the seniors, are represented, it is noteworthy that they only send illustrations of their work in far-off Japan, and not a single example of the large amount of work, and good work too, which they have carried out in Germany or even in Berlin. It can hardly be that the men of the highest reputation fear to jeopardise that reputation by showing their work, side by side, with that of their younger brethren. Nor (still more unpleasant to contemplate) is the abstention due to a lurking dread that German architectural art might be found wanting if fairly pitted against that of other countries.

A prudential reason leads the foremost German architects to keep dark the precise detail of their unexecuted work. If this is not done interference from certain high quarters is apt to occur, and certain favourite sculptors and others may be saddled upon the architect to the detriment of his freedom and control. Hence the German architect, entrusted with an important commission, not only does not make his design more public than he can help, but also takes care not even to allow the builder to hold a complete copy of his drawings. Such prudential considerations need not however, one might suppose, prevent the exhibition of drawings, photographs, and models of completed work, which could not fail to be of interest to the many admirers who are unable, in these busy times, to visit every important architectural work.

Si monumentum quæris, circumspice, may be a sound enough principle as applied to architectural art in its highest sense; for it is perfectly true that within the walls of an exhibition we cannot gather the actual works of the architectural artist as we can those of the painter or sculptor or engraver, but only a more or less faithful representation of them, which may lend a fictitious attractiveness, or, on the other hand, may fail to do justice to the actual work. Still, in spite of the initial disadvantage, the benefits of comparison are sufficient to justify a thorough and earnest attempt to gather together a collection that should be really international, and representative of the best work of all countries. Especially interesting would this be as showing the awakening that one cannot but notice, and the strides that are being made everywhere in architectural art, particularly amongst the younger men.

The Germans have a well-deserved fame for skill in organisations, and, if the seniors of the architectural profession would but lay aside their scruples and apply their best energies to the task, Berlin might show an international exhibition of architecture that should be worthy of the art and truly international. Although, however, this Exhibition

cannot be considered fairly representative of the architectural art of Germany, there is much that may be learnt from it as to the tendency of the men who will be the future exponents of architecture.

The first notable point is that the Schinkel era of strict classicality has now passed away. The younger men are seeking their inspirations from a study principally of their own national architecture, both that of the Renaissance and that of the Mediæval periods of German work. At the same time there is sufficient evidence to prove that this is not all that they study, but that the best work of Greece, of Rome, and of the Italian and French Renaissance is earnestly and carefully studied. There is, too, a notable absence of slavish copying of any old work, although the origin of the *motifs* that have actuated the production of the various designs can often be distinctly traced. The originality may sometimes be a little lacking in discretion, but even this is better than the absence of originality or the adherence to cold and correct work that has, till lately, been so markedly characteristic of German architecture during this century.

Interesting, as showing what power of design is possessed by the designers when a fairly free scope is allowed for their inventive ingenuity, are the few competition drawings of the large number submitted for a national memorial to the Emperor William I., proposed to be erected at the entrance to the Thier-garten opposite the Brandenburg Gate. One of the most elaborate of these is that by Paul Martin Otto, of Berlin, whose design has a central hexastyle propylæa, of the Corinthian order, surmounted by an attic and with semicircular wings. Above all is a bronze statue of a winged figure of Victory or Fame, with wreaths in each hand. In front of this propylæa is the equestrian statue of the Emperor in bronze, and at a lower level are standing bronze figures of Bismarck and Moltke. Surrounding the high level on which is the Emperor's statue, and enclosing the propylæa at the sides, is an Ionic peristyle with the walls decorated with paintings of the most important battles of the Monarch's life. Around this again, at a still lower level, is an open dome peristyle, which would form the real foot entrance to the park. The whole design is enriched with sculpture, bronze quadrigas, and a wealth of Classic ornaments, but does not appear overladen, and setting aside the cost, which would be considerable, forms a satisfactory memorial. The great difficulty in such a design as this, that of making the architectural setting sufficiently monumental without swamping the chief statue, appears to be here successfully met. The statue stands out well, and fairly holds its own, while the architectural portion of the design is monumental to a degree. The elevation is tinted in Indian-ink and shaded, the perspective coloured with considerable skill, body-colour being freely used.

The design by Bernhard Schaede for the same work is of less elaborate character, consisting of a circular colonnade leading to and connected with a central archway, which is surmounted by a flat dome. The design makes use of the Corinthian order, with plenty of sculpture, but hardly rises above the commonplace, while the statue of the Emperor is too small and inconspicuous. The design is shown in a perspective ink drawing, spirited and rapid in execution, and called a sketch in the catalogue.

A somewhat similar design by A. Mirkorszky, save that the semicircular colonnade is prolonged by a straight continuation, is shown in a vigorously-drawn, coloured perspective, and a tinted Indian-ink elevation.

The design by Ewald Becher differs from the last two in making the arched entrance the centre block of a quadrangle, the opposite side of which is partly open with flanking returns to the colonnade forming the quadrangle. In the centre of the enclosure is the Emperor's statue. This design, shown in a coloured bird's-eye view, though free from any trace of affectation or vulgarity, lacks vigour and suitability.

Bruno Schmitz sends a design submitted in this competition, which is chiefly notable for the style of the designer's drawing. The design follows the semicircular colonnade plan, save that the central archway is not pierced, as in most designs, but is the proscenium to a semicircular niche.

This gentleman is represented by a number of drawings, showing designs submitted in various competitions for memorials to the great Emperor, which are remarkable for the manner of their execution. They are of immense size, ranging from 80 to 100 superficial ft. in area, showing the designs in perspective to a large scale with the surrounding landscape. The architectural part is first drawn in Indian-ink, with a bold line and somewhat roughly; then the drawing is finished, in what is really a masterly manner, in charcoal or crayon, forming, indeed, diagrams rather than examples of the ordinary architectural perspective. Schmitz, who is one of the younger men of the profession, prepares these cartoons with great rapidity, and has been remarkably successful in the competitions for the memorials which form the subject of these designs. This style of representation is undoubtedly a suitable one for this particular class of design, where a consideration of the main features of the landscape has an important bearing on the fitness of the design for its position. In his designs, Schmitz shows as much originality and daring as in his draughtsmanship. Classic Greek Doric features are combined somewhat skilfully with Romanesque and Early Gothic forms, or, perhaps, one might rather say the designs show a Doric massiveness and directness of treatment which brings them into a certain affinity to the virility of both the Classic Greek Doric and the Early Gothic, whether round-arched or pointed. In masculine force of conception these designs somewhat remind us of Burges, without, however, the grace and the mastery of detail that Burges possessed.

Largeness of scale marks most of the drawings submitted in competition for many of the smaller memorials, though none are so tremendously big as those of Schmitz. Thus, the design of Hermann Stiller, of Düsseldorf, for the memorial in the Rhine Province, is shown in a large tinted perspective. The design goes on the familiar lines of a colonnade, here of the Ionic order, with central arch, and an equestrian statue of the monarch in front, whilst above all is the figure of Germania.

The first prize design for this particular memorial is that by Jacobs and Wehling, also of Düsseldorf, and is here exhibited. This has a screen wall at rear, backing up against the slope of the Drachenfels, with a hexastyle Greek Doric colonnade, the entablature of which supports an immense and massively-treated semi-circular arch of rusticated masonry. In the tympanum, enclosed between the arch and the entablature, is a large coloured picture, presumably in mosaic. In front, on a raised terrace, is an equestrian statue of the Emperor, and below this terrace a fountain, with a female figure, possibly to represent the Rhine, in a quadriga, the horses of which are prancing over the fountain-basin in very vigorous style. Around the fountain ascend curved steps leading to the terrace, on which stands the Emperor's statue.

Two other designs by Jacobs and Wehling, for similar competitions, are also hung, the one for Düsseldorf, and the other for Essen. Both of these show some originality and vigorous sculpturesque accessories, and are represented in powerfully-coloured perspectives. In the one a rectangular Doric pedestal, with battered sides, supports an equestrian statue of the Emperor wresting a flag from a falling Frenchman, the horse of the monarch rearing over a confused mass of prostrate horses, cannon, and combatants. On the verge of the pedestal a Prussian eagle is victoriously driving that of the French down the side, the latter sprawling in ignominious defeat.

The second design shows a Corinthian column with entablature complete, a by no means original or admirable conception, but relieved from insipidity by the remainder of the design. Above the column is the German eagle triumphing over a French snake, which is winding around the column. At the base is a female figure of Fame holding a wreath above the imperial crown, and at the foot under the crown, which is supported on a corbel, is a sloping shelf, where a standing figure could have stood under the crown, but which carries only a funeral wreath. The sentiment is thus somewhat forced in effect, and the taste somewhat doubtful, but the treatment in both cases shows a spirited feeling of design.

Messrs. Jacobs and Wehling also send a sheet, possessing considerable interest, containing as it does a number of sketches for various architectural designs, chiefly interiors, drawn for the most part on toned paper, and delineated in pen and ink, with tinting or in colour.

A series of sketch designs by Otto Rieth, of Berlin, is of somewhat similar nature. These are chiefly of pen-and-ink, tinted in ink or in pencil, and coloured, where they show, as many of them do, ideas for internal coloured decoration. These drawings or sketches are almost universally in perspective, and are evidently red-hot impressions of the first conceptions of the designer. It is interesting to notice that the light-and-shade arrangement is evidently of primary importance in this artist's mind, the detail being only most roughly indicated. Where the design is in colour, this it is that has the prominence,—the colour is fully indicated in mass, the detail of the drawing left.

The designs by Messrs. Ende and Böckmann, for the public buildings of Tokio, in Japan, are of considerable interest. First we have the original designs, shown in excellent coloured perspectives, which, in accordance with instructions received from the Japanese government by the architects, are in Renaissance, the design for the Law Courts being in Italian Renaissance of yellow brick and stone, with slate roofs of German character, imparted by a use of the bulbous form and other national roof-lines. The design for the Houses of Parliament is Palladian in general treatment, with a central dome and some eighteenth century German cupolas. The drawing indicates a stone building with green copper roofs. The remaining design of this series shows the Ministry of Justice. This is in a combination of Palladian and German Renaissance, intended to be carried out apparently in yellow brick and stucco, with slate roofs.

After the completion of these designs—which, by the way, illustrate the eclecticism of modern German architectural design, and are by no means unworthy of their authors,—a change of government occurred in Japan, with the result that the architects were instructed to re-model their design, so as to incorporate more nationality into the scheme.

This explains the second designs for these buildings, which are shown by elevations, and attain a certain amount of old Japanesque feeling by the treatment of the roofs and the clever modification of German and Florentine Renaissance, which is used for the design of the walls. These designs are to be credited to Messrs. Ende and Böckmann's chief assistant, who has since died.

A further change of government has, however, led to the abandonment of these second designs in favour of a more strictly European style, which is certainly a matter for regret, as the designs in old Japanesque are both clever in themselves and more faithfully represent the present state of Japanese national life, in which, however, the various conflicting elements are frequently blended with far less incongruity than is seen in these designs.

Public buildings in Germany itself are represented by competition drawings for various projects, such as the Law Courts at Bremen, where, naturally, German Renaissance pure and simple, or as pure and simple as German

Renaissance can be, is the favourite style, and is very well treated, with a thorough comprehension of its capabilities and qualities. Examples of such designs are the drawings by Rudolf Wirth. Of somewhat similar character is the design by Ludwig Klingenberg, for a Rath-haus at Leer, in which the German Early Renaissance style adopted is well treated, and shown in a coloured perspective. Wirth's design for a Rathskeller at Halle is another good example of the successful handling of the national Early Renaissance.

In opposition to this national class of design is such an illustration of ornate Neo Grec, with its large amount of French feeling, as we see in Carl Zehnder's design for the Parliament House at Strasburg, of which an elevation, longitudinal section, and perspective are exhibited.

There are to be seen in the Exhibition several designs for banks, both in Berlin and in other towns of Germany. For the most part, a stately and dignified version of Italian Renaissance seems to be preferred in their design; but there are occasional instances of departure from this general rule. Thus Wilhelm Martens shows perspectives of his designs for the Deutsche Bank in Berlin, and for a branch of the same bank at Bremen, both of which are in Italian Renaissance, while the same architect's designs for banks at Breslau and Reichenberg are in freely-treated adaptations of Early French Renaissance. We should mention a well-executed model in plaster of the design for the Bremen branch of the Deutsche Bank, in which the architectural detail, and even the forms of the mouldings, are executed with remarkable precision and skill. There are a few models in the Exhibition, of which this is one, and they all have the same characteristic of careful and accurate execution.

The use of models is one of the points in which modern German architects have an advantage over ourselves. All important buildings are carefully worked out in models before execution, some to a very large scale, as, for example, the Imperial Houses of Parliament now being erected in Berlin, which have been modelled full-size before being carried out.

Thoroughly good specimens of the stately and dignified use of Florentine Renaissance are the designs of Max Hasak, for the Reichsbanks at Leipzic and Aix-la-Chapelle. Other examples of skilful design in street architecture are the drawings by Heinrich Munk, in Italian Renaissance of Venetian character, one façade showing the wall space of the third storey and a high frieze above it, decorated in colour.

In strong contrast to these Italian designs is such a building as the residential flats for Rostock, by Möckel, where the red-brick architecture is based on that of Pomerania,—one more example of the present tendency to adaptation of old German styles to modern uses. Other instances of the same tendency, though in a somewhat different direction, are the designs based on German Late Renaissance or Barock, such as those by Alterthum and Zadek, and by Schilling, of Dresden, for shops and flats.

In detached houses or villa residences, of which only a few illustrations are shown, we find freely-treated adaptations of German Renaissance for the most part, occasionally modified by cockneyism of *fin de siècle* type.

Otto March, who shows some good work in domestic design for villa residences, has apparently not found the wealth of old German work sufficient for his eclecticism, but has endeavoured to follow, at a distance, some of our best English designers. The ideas, apparently, are only obtained from the study of illustrated books or journals, and the effect of inspirations drawn in this way from the work of Norman Shaw and Collcutt, mixed with that of Waterhouse, and Germanised, is amusing,—to an Englishman at any rate.

Another example of inspiration from British sources, though far more successfully carried out, is a design by Axel Guldahl, for a banker's house in Norway, in which the Scottish Baronial style has furnished many of the motifs and details.

In ecclesiastical architecture the most important design exhibited is that by Ernst Klingenberg, for the Cathedral of Berlin. This premiated design shows a large domed church, dodecagonal on plan, with buttresses, having traceried openings of upright form at the angles. The style adopted is Venetian Gothic, and the design is shown in a tinted perspective drawing.

The design by Ludwig Klingenberg for the cathedral of Bremen endeavours to incorporate the features of various periods of German Gothic, from Romanesque to fourteenth century. Thus the west front has four semi-circular Romanesque arches, forming the portals, while the two towers are Romanesque below, and gradually develop into early-pointed work and thirteenth century spires above. The nave and aisles are shown in a second perspective with windows of late thirteenth and fourteenth century German Gothic forms. The designer's idea has evidently been that, as we are the inheritors of all the ages, we are at liberty to use our inheritance as we please, and since we admire the charm possessed by many an old cathedral which has gradually grown under the hands of successive generations of artists, each developing the style and treatment of their predecessors, so we cannot do better when we are about to build a modern cathedral, by contract, with penalties for non-completion and so forth, than go as near as we can to the result achieved by past ages.

Ludwig Klingenberg also sends his second prize design for the garrison church at Strasburg, illustrated by photographs. These show a cruciform church with a central octagon, the design being based on early German Gothic in style. The design is marred by the unsatisfactory treatment of the roof of the central octagon and the flèche upon it, which is both too small and does not sit well upon the roof. The front is spoilt by the open arcade between the towers over the narthex, which looks very thin and unhappily weak.

Other church designs exhibited are mainly interesting as examples of the attempts of the German architects to modify and adapt the Mediæval Catholic type of plan to the requirements of Lutheran worship. In this, as in other Protestant churches, the sermon is of the principal importance, and, therefore, a church plan which facilitates the seeing and hearing of the preacher is the desideratum to be aimed at.

The general idea of meeting the problem is to adapt the traditional transeptal plan with nave and aisles of Mediæval times, and to enlarge the area at the crossing, somewhat on the principle to compare small things with great, of the octagon at Ely or the general Italian treatment as at Florence and Siena, and elsewhere. In external design, the modern German architect masks his central area under the roofs of nave and transept, or he makes his central area large by the use of very wide nave and transepts with very narrow aisles to the nave.

August Orth sends designs for the Himmelfahrt, Emmaus, Gethsemane, and Frieden Churches in Berlin, and the Church at Gundsfeld, near Breslau, which are various illustrations of attempts at solving the problem of a Lutheran Church. The Himmelfahrt Church is also shown by a plaster model which well explains the grouping of the design, and expresses the detail of the North Italian round-arched Gothic style adopted.

Johannes Otzen, whose work is not unknown in England, exhibits his design for the Reformation Church in Wiesbaden, planned with a square central area, with semi-octagonal transepts, externally treated as nave and transepts, with two western spires and towers. To an English eye this design lacks length, and is too much bunched up to be satisfactory. This fault is avoided in the same architect's design for the Lutheran Church in Berlin, which, with a central square, semi-octagonal transepts and east end, combines a wide nave with narrow aisles of fair length. This design includes a single tower and spire at the north-east angle of the plan. Like many of the Lutheran churches, this design has galleries to nave and central area,—another concession to the exaltation of the sermon.

In Catholic churches, as for example the new cathedral church in Moabit, by Weibertz, the Mediæval type of plan is more closely followed, as might be naturally expected. The style employed for this design is an adaptation of the North German brick architecture, which we, in England, generally regard as Pomeranian.

Theatres are not well represented in the exhibition. Indeed activity in this branch of architectural design has scarcely commenced in Germany, or at any rate in Berlin, and there is a future for the theatrical specialist. Berlin has several theatres it is true, but the Lessing Theatre,* built in 1888, from the designs of van der Hude & Hennicke, is the only one with the slightest architectural pretensions. The majority are utterly unworthy of a city like Berlin, and many are not even safe for their audience.

H. Seeling shows a design for the theatre at Essen won in competition, a by no means first rank example, and another for the Stockholm Court Theatre, a most important work, severely and suitably treated in a French modern classic style.

Carl Hülse sends plan, elevations, and perspective of the Concert-house or Casino at Hamburg, and also photographs, principally internal, of the executed work. These show the design to be another example of the modern eclectic spirit of German architectural design. The external treatment is a mixture of ornate Renaissance work of various styles. The ground-floor is carried out in a Florentine rusticated manner: the first floor adopts the Venetian type of Renaissance, while the gables follow the Early German Renaissance. The interior is executed also in varied treatment, the finishings being of an elaborate and costly character.

From Munich, besides some purely architectural drawings, of which the design by Georg Hauberrisser for the Rath-haus at Wiesbaden, a well-treated example of Early German Renaissance, is about the best,—Heinrich V. Schmidt sends some remarkable perspectives, and, still more notable, an elevation to large scale, executed in oil-painting by Ferd. Wagner, examples of whose work some of our readers may remember to have seen in the old Tivoli restaurant in the Strand.

A design which has been thought worthy of representation in the illustrated catalogue must be mentioned. This is a clever adaptation of round-arched German Romanesque to the purpose of a circular water-tower at Worms. The design is by Karl Hofmann, and derives much of its merit from a lofty roof and small staircase turret on one side.

We may now pass on to the international part of the architectural room. The most important contribution to this very small collection is from Russia; most important, comparatively, that is, both from the number of the works and the position of the exhibitors. The Russian drawings are mostly small in scale though not in subject, and treated with brilliant colour.

L. Benois sends two alternative designs for a church in Wladimir, both treated with red brick, yellow stone, and green copper roofs in the national Russian style, which one can perhaps best briefly describe as a developed and specialised form of Byzantine. The same architect shows a design for the grand stand and office buildings for the racecourse at St. Petersburg, and the third prize design in the competition for the Sühne-Kirche at St. Petersburg, which is in a Baroco style with roofs of typical Russian domical form.

Professor A. Tomischko sends the first prize design for the Sühne-Kirche, a cleverly-treated, excellent adaptation of Byzantine, with a large central dome. The design is shown in a splendidly-coloured perspective, and the whole work is one of the highest quality in the exhibition. The same artist

* Illustrated in the *Builder* of March 15, 1890.

also sends a design, in conjunction with F. Haberzethel, for the poorhouse at Wolkow, which is a fusion of Russian and Florentine Renaissance.

Professor V. Schroeter is represented by his design for the imperial opera-house at St. Petersburg, shown in tinted elevation and photographed plan. The style adopted is a Palladian treatment of Renaissance, and character is imparted to the design by the treatment of the high-domed roof over the stage and a lower roof over the auditorium. Professor Schroeter also sends his fourth prize design for the Sühne Kirche, somewhat similar to that of Professor Tomischko, but treated with alternate bands of buff and grey stone. Schroeter shows also his second-prize design for the Memorial Church at St. Petersburg, a brightly-coloured Russian domed design, with a single western tower and spire, with green copper roof. This architect's design for a cathedral at Orenburg also follows the traditional Russian style, and in the perspective appears pleasingly grouped, with central dome, and western tower and spire. The design by Professor Schroeter and J. C. Küttner for the Marian-Kirche at St. Petersburg is a change from these more important examples, and shows a wooden building with slate roofs of uncouth form.

L. Urlaut exhibits his design for the façade of Milan Cathedral, which well maintains the character of the building, and also drawings of a bazaar at Moscow, and a church at Ashabad, each of which shows the natural style in different phases.

In the design for a church at Gatschina, by Professor Dr. Grimm and J. Stephanitz, and also in the second prize design for the Rathhaus, at Moscow, by V. Hogen and Karlamoff, we see examples of the modification of the Russian national style by the admixture of the Italian Renaissance feeling.

Spain is represented by two works only. They are by Cayetans Buigas Monrava, of Barcelona, a design to large scale, plans $\frac{1}{50}$, elevations and sections $\frac{1}{100}$, for a triumphal arch and museum to celebrate the fourth centenary of the discovery of America by Columbus. The other is a design for the Palace of Justice at Rome, by Angel & Battlevell, of Madrid, which follows the Belgian variety of Neo-Grec, exemplified by the Law Courts at Brussels.

From Switzerland come the works of one architect only, Chiodera V. Tschudy, of Zürich. These comprise designs in elaborate Baroco style, for a theatre and concert-hall at Zürich, and for a dining-room to a hotel at Rheinfael, also designs for synagogues at Zürich and St. Gallen, both Moresque in style, and a remarkable façade for a small country house at Bevers, in the Engadine, which, with plain rectangular window openings irregularly disposed, is painted all over with figures and architecture in perspective, the architecture of varied styles, the figures on different scales.

Save for the works of Professor Emerich Steindl, of Buda-pest, Hungary is meagrely represented. We cannot but ask why, if Steindl's work is here, that of Ybl should be absent.

Steindl's drawings are representative and varied: his design for the Parliament House at Buda-Pest; for the Rathhaus, in red and buff brick and stone, with some of the sgraffito so largely used in Buda-Pest; and the design for the Joseph-Polytechnic being representative of his public work; while the drawings for the restoration of the Castle Vajda Hunyad, shown in perspectives of the exterior and the interior courtyard, and the design for the Schloss Rakovszky are evidences of the architect's ability in domestic work. Steindl also exhibits examples of church restoration in the St. Ægidius church at Bartfeld, and at the cathedral of Kaschau, which latter appears an interesting example of ornate late Hungarian Gothic. The design for the Buda-Pest Opera-house, by Professor Steindl, is also hung, though the executed design by Ybl is absent.

The exhibition of Steindl's work would make a good model for an international exhibition of architecture. If the works of the chief architects of different countries were represented as that of Steindl is represented, we should have an architectural exhibition of the highest interest, and really international.

Messrs. Oedön, Lechner, and Gyula Pártos, also of Buda-Pest, are the only other representatives of Hungarian architecture, their most noticeable design being that for the Stadthaus at Szegedin, a Baroco design with mansard roof of green and yellow coloured tiles with copper on the flat pitch. Their other works are some shops and flats of not very remarkable character in the Andrassy-strasse of Buda-Pest.

This brings us to the end of the architectural exhibition. No English architectural work has been hung as yet.

The collection of paintings is of considerable interest. Perhaps the most striking part of the Exhibition is the Spanish contribution, which, while manifesting some French influence, is of a very high order. Powerful draughtsmanship and full, deep, rich colour are well displayed in some of the large historical pictures, which form so prominent a feature in the Spanish work, and examples of which may be mentioned in "The Battle of Trafalgar," by Justo Ruiz Luira, of Madrid, lent by the "National Gallery of Madrid;" "The Convention at Caspe," by Andres Parladé, of Seville; "A Council of War in Spain, 1810," by Domingo Muñoz y Cuesta, of Paris. Other examples of Spanish painting of high order are exhibited, such as the painting by L. Jiminez, "La Visite. Une Salle d'Hôpital," awarded a second medal at Paris.

Italy is, though well represented by works in a variety of style, from the rigid following of the old masters to the slap-dash work of some modern Italians, behind Spain in artistic power.

The work of Polish painters takes a high position; the drawing is spirited, the colour rich and full. The works of Anna Bilmska are among the Polish work, and include examples of water-colour, pastel, and oil.

A remarkable specimen of Polish art is "The Young Artist's Dream of the Future," by Jacek Malczewski, of Cracow; so also is the large historical picture by Jan Matejko, of Cracow, "Skarga's Sermon before the Landtag in the presence of King Sigismund II."

Hungary shows in the works of many of its painters the qualities prominent in Munkácsy, three of whose paintings are exhibited. The collection notably contains a large proportion of genre, which to the foreigner is interesting as giving glimpses of the life of the natives. A remarkable portrait is that of his father by Julius Basch, of Buda-Pest. Another excellent one is that of the Gräfin von der Gröben, by Leopold Horovitz.

England is well represented in the matter of oil-painting by a selection of good work, Alma Tadema, Aumonier, Boughton, John Collier, Walter Crane, Mrs. Crawfurd, Stanhope Forbes, Sir John Gilbert, Herkomer, Holl, Colin Hunter, Yeend King, Millais, Linton, Ouless, Henry Moore, Pettie, Poynter, Richmond, Watts, Wyllie, Sir Frederic Leighton, and others, fairly maintaining our credit.

The American works exhibited are representative of the ubiquity of Americans more than anything else, but European American art is well supported by the work amongst others of Fred. Arthur Bridgman, Lucy Lee Robbins, E. L. Weeks, and the Japanese sketches of H. Humphrey Moore.

Belgium is adequately represented and so are Holland, Denmark, and Norway.

The German work shows some instances of high artistic quality, but the varied influences which have been prominent in moulding the minds of German painters have been so varied and conflicting in different cases that it is difficult to give a brief epitome of the characteristics of modern German painting.

Sculpture, engraving, and water-colour are not strong in quality or in quantity; some individual examples are of high order, but it is evident that too little trouble has been taken with these departments as with the architectural portion of the exhibition.

Oil painters, it is clear, merely tolerate other artists, in Germany as in England, regarding them as an inferior order of workers only moderately endowed with artistic feeling and powers.

NOTES.

WE print in another column a letter from a well-known architect on the subject of "Progress in Restoration," especially in reference to the new north transept of Westminster Abbey. In a good deal of what our correspondent says we are disposed to agree. Mr. Pearson's north transept is on the whole a great success. It has more of the power of Mediæval work about it than most modern work, except the best of Street's. But part of what Mr. Cawston notices and praises in the new work is the success with which it has been made to look like old work in surface as well as in design, except the inevitable cleanness of the new stone, which cannot be got rid of. Now that is another matter altogether. If it be really true, as Mr. Cawston says, that Mr. Pearson insisted on having some left-handed men on the work in order to give variety of inclination to the tool marks, we can only say that we think that a very foolish business. Then again it is pointed out that details which would seem to be intended to be equally spaced are not equally spaced, by intention. We noticed this device at Truro Cathedral, where the corbel table in the interior of the tower is of stones of different thicknesses and somewhat unevenly spaced. This is worse still. No man who exercises common sense apart from archæological prejudice can for one moment believe that this kind of irregularity in Mediæval work was done on principle. It was the result of the rough and ready way of building of the time. There is no merit in it. A repeated detail is either intended to be rhythmically repeated or it is not. If it is not, scatter it about anywhere. If it is, space it correctly. To do otherwise is only a sign of bungling, not of artistic spirit. To do so deliberately in order to give a sham-Mediæval air to a building is one of the most foolish forms of archæological affectation.

IN the remarkable "Investigations on the Pediment Compositions of the Parthenon," just published in the Athenian *Mittheilungen* (xvi., 1, 1891), Dr. Bruno Sauer breaks new ground, not only as to results, but as to method. The paper is likely to make no little stir in the archæological world, and specially, as is natural, among Englishmen. The British Museum authorities, who have done so much for the interpretation of the Parthenon marbles, need not and will not begrudge to Dr. Sauer the privilege of his new method, for it is based on observations that could only be made at Athens; nay, more, by mounting to the height of the pediments and examining the actual framework still *in situ*. This, as regards the western pediment, is, by the Turkish staircase, still possible, though perilous, to the ordinary traveller; but the eastern pediment can only be reached by ladders and scaffolding. Dr. Sauer's first idea was to investigate the accessible western pediment, and use the results, so far as available for the reconstruction of the eastern. His discoveries, however, proved of such unexpected importance that the German archæological Institute placed at his disposal the necessary appliances for studying the eastern pediment *in situ*. The result is, briefly, this: the traces of the attachment of the various figures,—traces of the most varied kind,—far exceeded what had been supposed. That such traces existed from the early pediment has been well known since Mr. Penrose published his "Principles of Athenian Architecture" (see plate 18). But a comparison of his plate (the new edition is in this respect unaltered) with that of Dr. Sauer

(*Mittheilungen*, plate iii.) shows at once how much had remained unnoted. The details of Dr. Sauer's argument can, of course, only be followed by reference to his plate, where the trace of all the various indications, *e.g.*, crowbar marks, clamp marks, marks for the attachment of attributes, and a host of others are clearly and carefully drawn in. It must suffice here to take two salient examples of the gains of this very objective method, and its use as a corrective of *à priori* reasoning. It has been conjectured, and the conjecture had always struck us as a beautiful and ingenious one, that in the eastern pediment Selene was represented as riding a single horse, not driving a chariot. She frequently so appears in ancient art, and she will present thereby a more varied balance to the chariot-driving Helios in the opposite angle. Alas! the graceful fancy fades in the presence of the stern double fact that the attachment made for Selene is too far away from the horses' heads to admit of the riding position, and [an examination of the actual pediment (for which the author of the theory had always pleaded) shows the *remains of two horses' heads in situ*. A second instance tells against ourselves. We had always held that the centre of the east pediment was occupied by the seated figure of Zeus, and that the actual moment of the birth of Athene was represented. Again, alas! the attachment notes show there was no centre figure, but as in the west pediment two equally-balanced figures occupied the centre,—they can have been none other than Zeus and Athene,—it follows that Athene was represented already born full grown. These are but instances of the wide-reaching value of Dr. Sauer's method,—a method which, as he himself says, only opens the way for new interpretation, a subject to which we may have occasion to return.

HERR CHR. BAUMEISTER calls attention in the Berliner *Philologische Wochenschrift* (May 9) to a splendid series of original photographs of Greek sites, and specially those of recent excavations. The existence of the series seems little known in Germany, and certainly still less in England, where hackneyed and out-of-date views still continue to be reproduced in popular handbooks. The negatives were made by Freiherr von Stillfried, and the series of 120 form, in some respects, an admirable supplement to the well-known photographs of Baron Paul des Granges. The subjects are Mycenæ since the excavations, *e.g.*, the façade of the "tomb of Atreus," as it appears at present; the Liongate, since it was cleared out; and the circular enclosure within the gate. The plates devoted to Epidaurus contain the famous but inadequately published Corinthian capital, and several pieces of recently discovered sculpture. In the department of landscape are have the Langada pass, the Meteora monasteries of Thessaly, the harbour of Laurium, a panorama in three parts of Sparta, with a background of Tayegetos and the waterfall of Styx. Those who are acquainted with the rich series already in the possession of the Hellenic Society may be glad to supplement their knowledge from this collection.

THE Decimal Association met with very little encouragement from the Chancellor of the Exchequer at the interview which took place on the 8th inst. between Mr. Goschen and the representatives of the Association. Indeed, it may be said that he poured the iciest of cold water upon their scheme by declaring that it would be a task which could be undertaken only when there was no other work to be done." This would relegate the reform to a most remote period, for it is undoubtedly one for which the country is far from ripe, and is but very slowly ripening. Hence, the Association disseminate literature demonstrating the undeniable advantages of the decimal system, the beauty and convenience of which is apparent enough to students, and to a considerable proportion of business men; but the bulk of the people,—who would be most directly affected,—are yet a long way from being reconciled to the thought of the changes which its adoption would involve. Education has, however, effected much in the past, and will doubtless eventually accomplish this most desirable reform. Mr. Goschen's remarks did not indicate any lack of sympathy, and were, after all, thoroughly practical, nor do we suppose that the Association will, in consequence, relax their efforts. They have to convince the community, to quote Mr. Goschen again, "to go through very great present inconvenience for the sake of ultimate advantage"—a necessarily slow process in a matter involving a complete revolution in transactions of such important and universal concern as buying and selling.

THE meeting of the Association of Master Builders on Monday last, to consider the question of the lock-out of the carpenters and joiners was an unusually large and influential one, and was practically unanimous. The resolution, which we have printed in another column, will by this time probably be posted up in every important builder's yard in the metropolis. The master builders have not in this case threatened the lock-out of any other trade than the carpenters and joiners, as it is from this trade only that the unreasonable demands have been made which they are determined to resist; but of course building work cannot be carried on for many weeks under these conditions without a practical stoppage of everything.

TWO engineers and one artist have written to the *Times* to complain of the proposed selection for the new gallery of English art of a site which had been recommended by a select committee in 1885, and by another committee in 1889 for a new building for the accommodation of the science collections at South Kensington. The contempt with which Sir F. Bramwell refers to the proposed alienation of this ground "for a picture-gallery" is characteristic enough; but there is reason in the objection, which Mr. Poynter also sustains, that the site proposed is in close topographical connexion with the College of Science, and that a piece of ground above the Technical Institute would be in immediate connexion with the Eastern Gallery, in which the Indian collection is now housed. Mr. Poynter goes on to ask why the existing galleries in Exhibition-road are not utilised for the picture gallery, remarking that they are the best lighted and best proportioned picture galleries in England. They are very good galleries for showing pictures, no doubt, in regard to lighting; but they were built rather as temporary galleries, and are not either in architectural appearance or in structure equal to what would be required for a permanent gallery of art. They could be rebuilt, no doubt, on the same section, and with better architectural façades and more monumental construction. The grievance of the men of science, however, in regard to the present proposal, is obviously not unreasonable.

ACCORDING to *L'Architecture*, the congress of French architects this year will be held at Paris from the 15th to the 20th of June. The following are the principa subjects to be discussed: "The formation of architectural museums;" "Architectural education in the Provinces;" "Instruction in the administration and accounts of architectural work;" and "The conservation of art-treasures on their original sites."

WE understand that the District Surveyors' Association have nominated their President, Mr. C. F. Hayward, for membership on the Council of the Royal Institute of British Architects, being desirous that the interests of District Surveyors should be more immediately represented on the Council than has hitherto been the case. While mentioning the Institute, we may add that at the recent annual meeting, the hon. sec. announced that the Council had made an alteration in the Soane Medallion competition, which until recently carried with it a sum of 50*l.*, conditional upon three months' travel abroad. Being the principal Institute prize, the Council have now decided to offer this time 100*l.*, and to make the period of foreign travel six, instead of three, months. The Council express the hope that students will show their appreciation of the change by competing worthily for the prize. This is an excellent move, and we hope its results will appear in the shape of a better contest for the Soane Medallion in future.

UNDER the heading "Is it Aristotle's Tomb?" Dr. Waldstein writes a short article in the *Nineteenth Century* giving a description of the circumstances of his finding the tomb at Eretria referred to, and discussing the probabilities for and against it being the actual grave of the great philosopher. He says:—

"I had been prepared to expect a person of distinction in this grave; but when I extracted from it one gold diadem (a band of pure gold about 1½ in. wide, with *repoussé* patterns on it: it was fastened round the brow), and then another, and still another, until six were drawn out, I felt confirmed in my anticipation. At the head, where a portion of the skull remained, the earth having dissolved many of the bones, there was another diadem with leaves of conventionalised ivy shape attached to it; then came a metal pen (the only specimen I have heard of as having been found in Greece) about 2 in. long, cut and slit like a quill pen; and then followed two styluses for writing on wax tablets, flattened at the end to enable the writer to erase a mistake, of the pattern already known. There were a number of terra-cotta statuettes in the grave; but one I found at the head struck me as being unique. It represented a type of statues of the fourth century B.C., known as that of a philosopher and orator. The hands of this draped figure were folded at the side. It was then that, for the first time, the thrilling possibility of the attribution of this grave to that of the great philosopher flashed through my mind, for Christodoros described the statue of Aristotle which he saw at Constantinople as standing with folded hands. But this possibility was not to be thought of, and still less mentioned, and it seemed hopeless to find any definite confirmation, inasmuch as the inscription designating the name of the family of the tomb must have been on the superstructure of the enclosure, which had gone. But the next day I excavated the grave beside this one, towards the centre of the enclosure, which, from its position and construction, is distinctly later, and at the foot of this grave, covered by a pilaster-like thick slab resting securely on this block, was a small marble slab which contained the inscription [Β]ΙΟΤΗ [Α]ΡΙΣΤΟΤΕΛΟΥ.

According to the best authorities on matters epigraphical, this clear-cut inscription is not later than the third century B.C. This inscription seemed to give one name of the member of the family here interred, and this name is that of Aristotle. According to the best authorities, the great philosopher retired from Athens, after the charge brought against him, to Chalkis in Eubœa, where he died, in the year 323 B.C., of disease of the stomach. There he had possessions, and there he left to his second wife, Herpyllis, 'his country-house in the garden.' All other accounts are considered apocryphal. Now Chalkis is the city immediately bordering upon Eretria, in the island of Eubœa, and the domains of these two cities adjoin one another."

Against these facts Dr. Waldstein says that it must be remembered that Chalkis is not Eretria, though immediately adjacent, that there were wars between the inhabitants of the two districts, and that the name Aristotle is not so uncommon, he having himself found eighteen inscriptions in which it occurs. On the other hand inscriptions relating to Chalkis have been found at Eretria; the grave is evidently that of an eminent man, and the grave of an eminent man is more likely to be found and recognised than that of an obscure person. Dr. Waldstein reserves his own judgment, merely giving the facts and the considerations on each side of the question.

THE London Playing Fields Committee has by its first report drawn public attention to its existence. Whilst such a body is to be welcomed, there may be some question whether the cause of open spaces and fresh

air is altogether benefited by the multiplication of these societies. On the other hand, if they work well together, it may be that they really are only on the same footing as committees of one large body, each looking after open spaces primarily to be used for different objects. Meanwhile, we commend to the attention of the above committee the question of securing the portion of Holland Park on which it is intended to erect houses, as a playing field, and also the advisability of securing as much land as possible near the northern extension of the Metropolitan Railway. This land is now very accessible, and affords perhaps the most favourable field near London for the operations of this committee.

THE Catholic chapel in Sutton-street, Soho-square,—commonly known as St. Patrick's, Soho,—has just been demolished. It is about to be rebuilt upon an enlarged area, for which the site of a house, No. 21A, on the eastern side of the square has been acquired. The new church will be erected by Mr. W. H. Gaze, contractor, after the designs of Messrs. Kelly & Birchall, architects. With the removal of that house and the chapel have disappeared, as we gather, the last remains of Carlisle House. There, with the Duchesses of Bolton and Kingston, and the Duke of Queensberry amongst her earliest patrons, Mrs. Teresa Cornelys used to give the concerts, ridottos, and masquerades, whose popularity ultimately waned before the superior and more decorous attractions of "Almack's" and the Pantheon. In "Records of My Life" (1832) by John Taylor, author of "Monsieur Tonson," will be found an account of a visit he paid to Mrs. Cornelys, at Knightsbridge, where he saw her in comparative indigence, selling asses' milk and keeping a breakfast-room for a living. She had been fined 50*l.* at Bow-street for allowing in her house "riotous assemblages of persons in masks"; in November, 1772, Mrs. Cornelys, of Carlisle House, St. Anne's, Soho, dealer, figures in the *Gazette*, and the Temple of Festivity is advertised for sale. About eight years later she finally yielded to adverse fortune, and in August, 1797, died in the Fleet. Carlisle House was built about two hundred years ago for either Charles Howard, first Earl of Carlisle, or his son and successor, Edward. In the parish rate-books for 1707, we have found that Earl Carlisle—Charles, the third Earl—is rated here at 5*l.*; the next house, being tenanted by "lady ffauconbridg," is assessed for 4*l.* 3s. This, then, must be Falconberg House, as occupied by Mary, Lady Falconberg, daughter of Oliver Cromwell, and wife of Thomas, Viscount Falconbridge. She died March 14, 1712, and was buried in Chiswick churchyard. The street, indeed, takes its name from Sutton Court, Chiswick, a country-house of the Falconbergs, and Falconberg-court yet remains. Falconberg House was latterly known as the White House, when it enjoyed a reputation very similar to that of the house of Mrs. Cornelys at the opposite corner of Sutton-street. With the exception of one or two rooms, the interior has since been practically rebuilt, and as No. 21, the house is now incorporated in Messrs. Crosse & Blackwell's premises in the square. The greater portion of Carlisle House was dismantled in or about 1804. But the music or ball room, connected with the house by the "Chinese Bridge," had already been secured and converted for purposes of the chapel of which we speak. A gateway, now destroyed, formed the entrance for the sedan-chairs, of which the bearers were often entreated, in Mrs. Cornelys' advertisements, to behave themselves in a more seemly manner. A similar gateway of Falconberg House, opening into the courtyard, has lately been pulled down.

THE *Courrier de l'Art*, which has reappeared, after a temporary cessation of publication since December owing to the serious illness of the editor (a reason which seems to be quite accepted in the easy-going ways of French journalism), publishes the following comment on the distinction between the treatment of Sunday in London and in the provinces in this country, which is not without its point:—

"*Mappin Art Gallery, à Sheffield.*

De ce que Londres est mortellement ennuyeux le dimanche, de ce que la poste n'y fonctionne pas, de ce que toute distraction intelligente y est proscrite, on n'a que trop souvent le tort de conclure qu'il en est ainsi dans toute l'Angleterre. C'est une vaste erreur. En province, la poste fonctionne dans la matinée du dimanche, et on n'y commet pas ce jour-là, comme à Londres, l'insigne sottise de refuser l'entrée des Musées au public. C'est ainsi, par exemple, qu'à Sheffield la population ouvrière est des plus assidues à fréquenter le Musée le dimanche. Du 1er au 9 janvier 1891, la moyenne des visiteurs quotidiens a été de 632, mais le dimanche 4 janvier, il n'y a pas eu moins de 1,475 personnes qui sont venues étudier les œuvres d'art."

THE second exhibition held by the Armourers and Braziers' Company at their hall in Coleman-street, is in most respects similar to that held last year, which was noticed and illustrated in our columns. There are a large number of copper and brass repoussé dishes by Mr. Pearson, in the style which is generally associated with his name, and various smaller articles such as sword-hilts, door-plates, and frames of various kinds. One of the most original and carefully-executed designs is that of an oval jardinière in copper and brass, with subjects, "Night and Morning" on four panels. This is by Mr. Samuel Cope. Several lamps, principally designed for the electric light, are suspended from the ceiling. That by Mr. Henry Ross is treated in bronze, another by Messrs. Strode & Co. in brass, and a third by Mr. C. R. Ashbee in copper and pewter. The Lyzwick Hall Art School, Keswick, amongst other objects sends a beaker, repoussé work in copper, which combines simplicity of form with richness of decoration, and the lip is apparently a good one for use. The rooms devoted to designs and models show an advance on last year. A design for coat-of-armour for a Gesso model executed by Mr. G. F. Watts as a study for his picture "The Court of Death," and a portion of a frieze illustrating the "Expulsion of Evil" designed by Miss Mary S. Newill, are two amongst a large number of interesting designs. A fourth room contains a loan exhibition of arms and armour and various objects in metal.

ARCHITECTURE AT THE ROYAL ACADEMY.—III.

1,746. "Proposed Church of St. Mark Salisbury;" Mr. J. A. Reeve. A perspective drawing of a solid-looking Late Gothic church, hung too high to see detail; the west tower with its lantern termination has a rich effect, but the pinnacles seem rather too heavy for the scale of the tower.

1,747. "Scuola Hanbury at Latte, Ventimiglia, Italy;" Mr. W. D. Caröe. Interesting as a treatment of a modern Italian building by an English architect, in somewhat of native manner. The front shows an open round-arched loggia on the ground story; a square campanile with a low-pitched hip-roof rises from the centre of the front, strengthened with a buttress in the middle of each face; the whole building is roofed with a spreading low-pitched hip-roof of the general proportion and design which is native to the country. A small plan is appended. The drawing, as a drawing, is rather injured by lining-in too much for shadows, a common mistake in recent pen drawings; it spoils the brightness of a drawing and obscures detail.

1,748. "St. Matthew's Parish Rooms, Clapton;" Mr. Arnold Mitchell. This is a companion to No. 1,737, of both of which we publish reproductions this week; this one appears to be an executed design, the other being only a competition drawing. Both are charming specimens of the artist's manner of working in brown tint, the effect of which we have endeavoured to reproduce to some extent in the illustrations; he knows how to arrange his lights and shadows for the best effect, though it must be admitted that the manner of finishing the drawings conveys a great deal of the effect of old work, and the building would probably hardly appear so picturesque in execution as in the drawing. The design however is simple and suitable for its purpose.

1,749. "St. Cuthbert's College, Worksop; South Front;" Messrs. Carpenter and Ingelow. A coloured elevation of a Late Gothic collegiate building, red brick and stone dressings, with stepped gables at the centre and wings, and square-headed mullioned windows; the whole treated in a simple, unaffected manner. The centre doorway shows a little decorative treatment, and a statue rises over it. A little defect which strikes the eye at once in an otherwise pleasing elevation is that the square dormers at the top have the sills of the windows exactly on a level with the coping of the wall between them, so that they seem built on to and unconnected with the substructure; the windows should have been brought a little lower or the coping carried a little higher.

1,750. "The New Town Hall, Cleckheaton;" Messrs. Mawson and Hudson. A small pencil sketch, very nicely touched in, though slight, of a picturesque front in the modern manner which is based on Elizabethan. A little sketch-plan is appended. The drawing is so modest and reticent in style that it escaped our notice in our previous notes on the examples of municipal architecture in the room.

1,751. "House at Melbourne; Garden Front;" Mr. R. Mortimer. A slightly hard and mechanical pen drawing, but there is picturesque effect in the design, especially in the bold treatment of the two large semi-circular arches, rising from the plinth-line as an impost, which form openings to two verandahs; these give a distinct character to the design.

1,752. "Welsh Church, Briton Ferry;" Messrs. Seddon and Carter. A small sketch of a Gothic church simple to the degree of naïveté, but not the less suitable to a country situation. It has a low battlemented south-west tower with a small scaled tower; a little expression is given to the church by the grouping of the windows.

1,754. "A Bungalow;" by Mr. R. A. Briggs. This is published in the present number, along with another drawing of the same class by the same hand. It is not very often that we see anything so solid as a Doric order brought in as a verandah, but it looks well, and certainly is a welcome change from the ordinary cast-iron standards with ornamental capitals, and gives an architectural character to a simple and unpretending house.

1,757. "St. Barnabas Cottage Hospital, Saltash, Cornwall;" Mr. G. H. Fellowes Prynne. This is a very well-executed tinted drawing of a rather picturesquely varied group of buildings, but a little too important to answer to the idea of a "cottage" hospital, and as there is no plan it is impossible to say out of what features arise the suggestion for this rather heaped-up conglomerate of building. Is the apse in the rear that of a chapel? or if not, what is its connexion with the plan of a cottage hospital?

1,758. "Schools at Knowle, Bristol;" the late John D. Sedding. This is an admirable water-colour showing an interior court of those charmingly picturesque schools, a drawing of which was exhibited in last year's Academy, and illustrated in the *Builder* for June 14, 1890. It shows again Mr. Sedding's keen eye for the picturesque of mere building, independent of any ornament. The manner in which the square stone bays are carried up, like pillars of masonry, to stop against the underside of the wide projecting eaves, and connected below by the arched recesses with bits of lean-to roof, is a delightful example of the production of picturesque effect from the mere arrangement of the necessary constructive portions of a building. Perhaps "it were to consider too curiously," as Horatio says, to ask what or whether any interior use is made of the spaces under those bits of lean-to roof; but anyhow the whole is a charming picture, and if it were an old building it would be in fifty sketch-books.

1,760. "A Country Parsonage;" Mr. F. H. Tulloch. A pretty pen drawing of a house with large gables filled with vertical half-timber work, resting on a different treatment in the ground story, and with a rather large mountain of roof rising in the middle above the two gables. We do not know that we should take it to be a parsonage if we stumbled upon it in a country parish: as a general rule country parsonages are rather more sober in their lines.

1,761. "Borwick Hall, Lancashire;" Mr. E.

Hartley. A nice pen sketch of a delightful old Late Gothic house. We published a reproduction of the drawing in the *Builder* of October 18, 1890.

1,762. "Oswestry Municipal Buildings;" Mr. T. E. Pryce. The modern Pilaster-and-Mullion style (we must invent a name for it); a pleasing front, but containing no features to differentiate it from many other modern buildings in the same manner. The windows in the side portion of the façade appear to want something between them and the eaves, against which they are pushed up in a rather crude fashion.

1,763. "St. Wulfran, Abbeville, West Front, North Doorway;" H. Wilson. A slight but freely-treated water-colour sketch, but which, in comparison with some others of the same artist's water-colour drawings, seems a little cold and deficient in colour.

1,764. "Church of St. Mary Chepstow; restoration;" Messrs. Seddon and Carter. If, as would unquestionably be the case in a French exhibition, a drawing were given showing the present state of the church, we could then form a judgment as to the restoration. According to the wretched system pursued in England, all we can see is a drawing of a church, of which we know not what is new or what is old, or what the whole thing means. We do not charge this defect necessarily on the architects. The probability is that if they had sent a drawing showing the actual state, the Academy would not have hung it.

1,765. "Chapel in the East of London arranged to be used also as a Hall and Schoolroom;" F. W. Troup. Two geometrical elevations, and a small plan and section, of what seems to be a simple building suited to its purpose, but it is hung too high to be seen.

1,766. "Wall Decoration;" Mr. Sydney Vacher. A rich and effective "pattern," suitable for a wall-paper, and very harmonious in colour; the main features of it are decorative blossoms of a crimson tone, treated flatly, and encircled by leafage of a warm but delicate yellowish tone. The details are all exceedingly good; the defect of the design is a want of continued growth, the repetition parts seem rather spaced side by side than leading naturally into one another.

1,768. "Two Interiors of Halls in Two Bungalow Houses;" Mr. R. A. Briggs. Rather lofty halls for the type of house called "bungalow." One of them has an open timber roof with a large open fireplace with armour over it; the other is a galleried hall with a flat ceiling with heavy pendants on it, we fear of plaster.

1,769 "St. Lucy's Home, Gloucester," and 1,770 "Almshouses, Beckenham Kent;" two small water-colour drawings of buildings by the late J. D. Sedding. The first is a simple cottage, with a wide window at each side of the entre doorway, which is recessed so as to form a little porch; the other is a rather larger and more irregular building of brick with tiled roof, with half-timbered gable introduced. The first-named building (of which a small plan is given), though so small and simple, is treated in detail in a manner that at once shows the hand of the architect.

1,771. "Entrance Gates, the Villa Aurelia, Rome;" Mr. Thos. H. Watson. We presume these are modern gates, although they date from Rome. They form a graceful piece of rather elaborate wrought-iron work, the detail rather open at the bottom, and crowded in order to get a rich effect above. A wreath and two cupids at the centre and sides of the top are apparently intended to be gilt; in the centre of the scroll work is a shield and crest. The defect of the design is that, with a good deal of pretty detail, it is rather too "busy," wants coherence, and some parts of it are deficient in purity of line; for instance, the crooked line of the band at the lower part of the gate head, which catches the eye disagreeably with its accidental-looking bends.

Proposed Public Park or Garden for Hanley.—The *Staffordshire Sentinel* publishes the details of a proposal for the creation of what may be called an in-town park or garden for the East Ward of Hanley. Messrs. Sugden, of Leek, in conjunction with Mr. Jackman, landscape gardener, have prepared a plan for dealing with the site, space being reserved for a bowling-green, a quoit-ground, and a tennis-lawn. Separate playgrounds will also be provided for boys and girls. The area of the proposed park is ten acres, and the cost of acquiring it is put at 4,500*l.* The cost of laying out the ground is estimated at 2,500*l.*, and this sum it is proposed to raise by voluntary subscription.

THE NAVAL EXHIBITION.

Like the Military Exhibition, the Naval Exhibition in the same grounds has a good deal of the bazaar about it. Show-cases of manufactures of various kinds, which are only in the most remote degree connected with the ostensible object of the Exhibition, seem the necessary and inevitable way of filling up the middle portion of the floor in the covered galleries, and are in fact nothing more than a series of advertisements. These of course we may pass over, rather regretting their presence as jarring with what should be the prominent object of such an Exhibition, viz.: the history of naval architecture and naval warfare. These subjects, however, are very fairly represented in the Exhibition, in spite of the admixture of a good deal of claptrap or of mere shop considerations.

The irregular quadrangle of galleries which makes the chief portion of the indoor show is divided into the Franklin Gallery, the Nelson Gallery, the Howe Gallery, the Cook Gallery, the Armstrong Gallery, and the Seppings Gallery. The origin of all the names but the last is obvious; it may be necessary to mention that Sir Robert Seppings, an eminent naval architect, was Surveyor of the Navy in the reign of George IV. The end of the Seppings Gallery brings us round again to the entrance.

The Arctic sub-division naturally finds place in the Franklin Gallery, and includes a number of Arctic relics, and examples or models (full size) of sleighs and boats used in Arctic exploration. From this we pass into the Nelson Gallery, which is the Art Gallery of the Exhibition, along with the Blake and Benbow Galleries, which are parallel with it, but appear to be not complete in their arrangements; at all events they were barred to the public up to the middle of this week. The Nelson Gallery is in one sense rather a melancholy spectacle. It is exhilarating no doubt, to find records of such a host of deeds of naval daring crowned with triumphant success, but one cannot help wishing they had not given rise to so many ludicrously bad paintings. Improbable ships, in too many of these works, sail upon impossible water; in fact the general impression conveyed is that the sea painters of the end of the last and the earlier part of the present century never took the trouble to look at the sea to ascertain what it was like, but gave it the colour and the drawing which happened to suit their composition. There is one big Turner here, the property of the Admiralty, of the battle of Trafalgar, in which a great grandeur is given to the *Victory*, with her pomp of canvas, the ship appearing in fact to be supernaturally enlarged for the purpose of Turner's effect; but the water is very little better than that of many of the paintings by inferior and unknown hands. The Admiralty also lend De Loutherbourg's large painting of the 1st of June fight, in which the water is even more curious than Turner's; it answers the purpose of the painter's theatrical colour scheme, but it really looks more like treacle than water. There is a small picture of the battle of Trafalgar in the present Royal Academy Exhibition, by Mr. Wyllie, which, as a pictorial representation, it may be fairly said is worth all the contents of the "Nelson Gallery" at Chelsea put together; there we see real seawater, bright in the sun, with its long even heave on which the ships roll slowly, not jumping up into a heap, regardless of the action of wind or the laws of gravitation, whenever the painter wants it for his "composition." However, peace be with the old naval painters; they meant well, and they certainly had plenty to show of interest in their subjects, if the treatment of them was rather mannered and theatrical. That a painting should intend to do honour to Nelson is perhaps a sufficient ground for treating it with respect. Among the best of the old pictures is one of that remarkable exploit of Nelson's at the battle of St. Vincent, when, having boarded and captured one line-of-battle ship of the enemy's, and finding her foul of another, he led the way into the second ship and captured that also. But it is very slow of the compilers of the catalogue not to have quoted the *mot* of the sailors on the occasion, who spoke of the exploit as an example of "Nelson's patent bridge for boarding first-rates." The British tar of those days was given to saying spirited things, but he seldom said anything more spirited than that. The painting of "Cornwallis's Retreat" of June 17, 1795, by Elliot, when Cornwallis made good his retreat from a much larger French force by the most masterly manœuvring, is interesting as giving us the effect of the old sailing-ships in line, an effect finer, in a picturesque sense, than anything the modern navy can show. Among the figure-subjects, scenes on the decks of the ships, West's old painting of the "Death of Nelson," lent by the Corporation of Liverpool, comes out very well, and in general effect is perhaps superior to Maclise's more brilliant performance hung underneath it, in which there is admirable character in many of the figures, but the whole seems too impossibly and theatrically crowded. Mr. Wyllie's picture of "The Mighty Fallen," the breaking-up of an old line-of-battle ship, is a pathetic picture, and the late Mr. E. W. Cooke's large painting of "H.M.S. *Devastation*" is powerful in its way, though a little amusing from the obvious determination on the part of the artist to overawe us with a terrible and thunderous effect.

In the Cook Gallery are collected a large number of exhibits of work appertaining to various departments of navigation; signals, buoys and beacons, marine meteorology, hydrography, and instruments used in navigation. Among these are many models of lighthouses, besides the full-size model of the new Eddystone which is erected in the grounds, to the details of the construction of which we will make further reference next week. An interesting collection of sounding-machines of various dates is also to be found here; and the Models Section contains a collection of models of apparatus for lowering boats with speed and safety; that operation for which so many means have been devised, none of which seems to have recommended itself finally and undeniably as the best for lowering boats in a heavy sea.

In the Seppings Gallery are a collection of marine engines or models of engines, and a very large and beautiful collection of models of ships of various dates. This is one of the most interesting portions of the Exhibition, and will in itself well repay a visit. It includes a historical series of war-ships of various dates in this century, chiefly during the last forty years or so, giving a graphical exemplification of the progress of ship-building in the navy. One or two very fine full-rigged models of the sailing men-of-war of the old school are not the least interesting of this class of exhibits, and make one almost inclined to sigh over the progress of modern science which has relegated these splendid objects, with their grand spread of sail and yard, and their forest of tackle, to the position of mere models for museums.

In the St. Vincent Gallery, running along the north side of the grounds, are the ordnance exhibits. We commence with models or examples of old ordnance, proceeding onwards to models or specimens of modern projectiles, heavy guns, and the class of quick-firing guns, Hotchkiss, Maxim, and others. The Armstrong Gallery succeeds to this, the ground-floor of which is laid out as a half-plan of the deck and battery of a modern ironclad, with a completely-furnished "gun-room" and lieutenant's cabin. On the upper floor are arranged a large series of models, including the large model of H.M.S. *Victoria*, with her torpedo-nettings out, and every visible detail finished most beautifully. This model claims to be "probably the largest and most beautiful ever constructed," it would certainly seem difficult to surpass it. The large "Camperdown Gallery," along the east side of the grounds, contains an extensive torpedo exhibition, with Whitehead torpedoes entire and in sections, and models of torpedo mines. A large collection of materials used in ship and engine construction are also arranged in this gallery. There are some splendid examples of large castings, especially a three-throw crank-axle of "Whitworth fluid compressed steel," for H.M.S. *Jumna*. A model of Whitworth's measuring-machine, for measuring to the $\frac{1}{1000000}$ of an inch, is exhibited. The measurement is made between two small discs which form the extremities of two castings mounted so as to slide to and from each other on a horizontal bed. A screw axle traverses them, and a direct turn with a wheel at one end of the screw puts the two points approximately in the required position. The minute measurements are read off from the rim of a much larger wheel which communicates a much smaller movement to one of the measuring-points, the rim of the wheel being divided into a scale of 500 parts, and working against a vernier.

Between the St. Vincent and Camperdown Galleries is the Armstrong Gallery, where are to be seen some large guns, and a model of a 110-ton gun, accompanied by a full-size diagram on the wall of the target penetrated by the shot in a recent experiment, the path of the projectile being indicated on the drawing. A more awe-inspiring example of the penetrating power of modern artillery it would be difficult to imagine. The structure of the target is as follows:—Commencing from the outside face, opposed to the shot, we have 20 in. of compound metal backed by 8 in. of iron; next, 20 ft. of square oak beams built up in courses across the direction of the shot; then 5 ft. of granite blocks; 11 ft. of concrete; and finally 6 ft. of brickwork. The projectile went in a straight line through the whole of this material up to the middle of the brickwork, in which it stopped about half-way, or only 3 ft. short of the full section of this tremendous target.

Among the mere shows of the Exhibition there are two that are well worth seeing. One of these is the model of the *Victory*. This is only a model in a sense that it is not a real ship but a built-up imitation of one. It is the actual size of the original, and is made up with a realism which is extraordinary. The main gun-deck, on to which the visitor comes on entering, is completely fitted up as if for action, all the guns and gear in their places, and between the appearance of things and the congenial smell of tar it is easy to believe for the moment that one is on board of the old ship. In the fore-part of the deck is to be seen one of the vast hemp cables which were in use before the days of chain cables. Below is the cockpit, not tall enough to stand upright in, and one can fancy what an *inferno* it must have been in time of action. Here there is a group of modelled figures of the dying Nelson and his attendants,—the only incident we regret in the model; it gives a Tussaud air to what is otherwise an interesting and splendidly-executed piece of work. The other show to which we refer is the panorama of the battle of Trafalgar. The visitor is supposed to be on the quarter-deck of the *Victory*, with the ship's length extended in front of him, beyond is the sea and the ships engaged in the action. The thing is very well done, and the illusion for the moment very complete, as far as the eye is concerned; "the thunder of the captains, and the shouting," certainly, we cannot have in a panorama.

It is hardly within our province to do more than give a general sketch of the contents of an Exhibition of this class, though there are one or two special departments of it to which we may give some more detailed consideration on another occasion. The first approach from the usual entrance is not fortunate in its effect, and gives, as we have observed, rather a bazaar-like impression; but there will be found to be plenty of solid practical interest in other departments of the collection.

STAINED GLASS.*

YOU must know what glass is before you can judge of it, and you should be able to judge of it (if you have anything to do with it), in order to be able to distinguish good from bad, and so be able to promote the one and discountenance the other.

What, then, is stained glass?

Well, let me first tell you that it is by no means only that which is often called painted glass. To have a figure in a window it must of course be painted, but the staining of a window is its colour, the painting of a window is merely the drawing and shading of the figures and forms in it with brown paint. With regard to colour, there is only one right way to attain it, but there are several wrong ways, which, though really very contemptible, are worth a word of warning, for, unfortunately, they are only too common:—I allude to certain cheap and very nasty things which pretend to be "substitutes for stained glass." They all attain their end by a film of colour on the surface; you will have a very good illustration of the difference between them and stained glass if you take two wine-glasses, put them between you and the light, paint the inside of the one with the purest water-colour you can get—say rose madder—and fill the inside of the other with fine old port. Real stained glass, then, like the glass of port wine, is stained through and through, its colour is a part of its existence, and has been conveyed to its whole mass by chemical processes while in a state of fusion in the course of its actual manufacture. Here are some pieces of the lightest tinted kinds of stained glass, "whites" as they are called, and you will see that they appear but little removed from white; but to show you how completely imbued they are with such colour as they have I need only show you them against the light, edgewise, when one appears deep sea-green, another blue, and a third orange. That, then, is stained glass, a very noble material, worthy of much respect.

Now, of course, a mass of liquid substance in a vessel will be of one colour throughout, so that you will easily understand that a sheet of glass, blown as it must be direct from the melting-pot, will, as a rule, have but one colour, with slight accidental varieties of tone, arising from the colouring matter having been unequally distributed. It therefore follows that in a window where various colours are desired, each separate tint must be cut from a separate sheet, and they must be joined into a patchwork or mosaic by some mechanical means; there is but one,—lead. They are joined together, then, by a strip of lead, grooved on each side, to receive the



edge of the glass. But we have got on here too fast; this is the last process by which the window is finished; let us go back to the beginning and consider it step by step.

A window is wanted, let us suppose, richly coloured and containing a sacred subject. In the first place, a full-sized cartoon is made representing the window exactly as it is to be, lead-lines and all, and a separate small sketch is made giving the colour. This work always should be, and not always is, done by an artist who knows intimately all the processes and capabilities of the material, and who has worked on the glass itself in all its stages. It is not enough that he should be able to design poetically and execute work nobly in some other material. Oil-painting, for example, is incomparably more difficult than glass-painting, and yet there are not half-a-dozen members even of the Royal Academy who are much more fitted to make the working drawings for a window than they are to make those for, say, a steam-engine; they are *somewhat* more fitted, no doubt, for their knowledge of the figure is germane to the one purpose and not to the other, but that is all; technical training in the material itself is essential to working in it successfully and intelligently; on the other hand, unfortunately, those trained only in the shops receive a very poor artistic education; they work long hours in the glass factory, and pick up their knowledge of drawing in some Government night-school, under gas-light, when they ought by rights to be resting.

A separate cartoon, on tracing cloth, of the lead-lines only is the next step. It is traced from the original in order to guide the cutter, who, from it, cuts out in cartridge-paper the accurate shape of each piece of glass; this bit of paper he uses as a gauge; he lays it on the sheet of glass and draws round it with his diamond, one side at a time, breaking the glass away as he goes with his fingers, or, if the pieces are small, with pliers. The glass being all cut, the pieces are taken to the painting-room, where the painters first trace with the metallic enamel all the outline the artist has provided, or put some in out of their own moral consciousness, if they think the artist has provided too little. The foreman painter generally does the flesh, and his subordinates the draperies, &c., the only person who rarely has a finger in the pie being the artist who designed the whole. I remember once, in an establishment where some work of mine was being painted, taking up a brush to alter the expression of a head which had rather missed my intention; but I was very soon taught my place, for the painter who had done it came up in much disturbance, and told me that he never allowed any one to touch "his work." His contention was intelligible enough,—he was responsible only to the head of the firm, and a designer for stained glass who had ever touched glass was something new to him. I had, however, to get these relationships amicably readjusted, and I wish they were so generally.

The expression of a head, for example, depends more upon these black touches than upon anything else, and if there is one part of stained-glass work more than another which the artist himself always ought to do, and never does, it is the outline. However, the outlined bits are next put into the kiln and subjected to great heat, which fuses the outline indelibly into them; they are then taken out and waxed down in their proper places upon a sheet of plate glass, so that the whole can be raised upright on an easel against the light of the sky, in which situation it is to be painted. Not to weary you with technical details, the shading of the figures, &c., is then copied by the painters from the cartoon, by a series of processes known to them; some work in one way, some in another, but, as a rule, chiefly by *removing* what is necessary out of an even tint or "mat" first laid over the whole glass, much after the method of mezzotint in engraving,—this work is done with various kinds of rough hog-hair or wire brushes called "scrubs," the finger also being often used as well as a style or needle, the material originally laid on being a brown enamel powder, much the colour of snuff, ground up with water and a little gum or sugar. A great amount of finish can be got in this material, and a very realistic picture produced. When finished, the pieces are again put into the kiln to fix the shading, as the outline was previously fixed, and they generally then pass through a second painting and a second fire. But we have not done, even then; they are taken out again for a final process, which is of great importance. I said that the colour of stained glass was conveyed to the whole mass of it while liquid, and not laid on the surface, but there is one splendid exception—a pure and brilliant yellow, made from silver and known as silver stain. It is applied to the reverse side of the glass (the one that will be the outside when the window is put up), and then the pieces so treated are again fired, rendering the yellow perfectly permanent, as specimens centuries old attest. If there is a danger in its use, it is that of our being tempted to use it to excess, for it is very fascinating; by it a crude, primary blue can be shaded off into green, a red can be brought from crimson, through scarlet to orange, and almost to yellow itself; and, used on the whiter glasses, it can, without any additional lead-line, turn the hair of some youthful figure into silky gold, throw a nimbus of amber light round the head of a saint, or be drawn as a golden diaper pattern over some rich robe. This is the final process: the pieces are leaded into their places by the guidance of the same cut-line by which they were cut, the joints are soldered together, and the interstices between glass and lead filled with cement, and the window is finished.

Now, I have said one thing upon which I wish to make a very grave criticism; the sentence is this: "A great amount of finish can be got in this material, and a very realistic picture produced." But, I ask, is this desirable? I think not, seeing that the said "material" is that brown enamel powder which I have compared with snuff, and it seems to me that the realistic treatment of the glass in such a material could only be defended if it could be shown that there is no other decorative art more capable of pourtraying for us the full beauty of the human form and the other elements of a great pictorial conception; but this is not the case: oil-painting and fresco can do the thing quite as delicately, quite as realistically, and much more truly, since they both have it in them to show that the shadows on flesh are *not* snuff-colour, and that human beings do not, as the world is constituted, walk about surrounded by a pitch-black outline ¼ in. wide. Stained glass is bound by these two stringent limitations, and those who attempt realism in it are driven to the expedient of covering up *all* the glass with enamel, and blurring and disguising the lead-line, and running it down the shadows of the drapery to hide it. You see they are obliged to cover up all the glass with *some* depth of tint, or the pieces left of clear glass would sparkle, so that the flesh would no longer look soft and smooth, the eye no longer liquid. But which is more important, that the flesh should look soft and smooth, &c., or that the window *should* sparkle? Of course, it *ought* to sparkle! it's the very thing that a window can do and that nothing else can do so well, and to disguise this quality for the sake of anything else is to seek an undesirable end; it is a most unworthy slight upon a noble material, distresting its own lovely qualities of colour and translucency to force it, at their cost, to an end for which it is not fitted; nay, for which it is in a very

* A paper read before the Liverpool Art Club, on February 2, by Mr. C. W. Whall.

mischievous way *un*fitted. I said that those who treat glass in this way can get realism, though of a vulgar kind and at great sacrifice. But in aiming at realism there is one thing that they do get with a vengeance, and that is emphasis; for you will easily understand that the light through the glass will be the strongest light in a church, and the black of the lead-line against it will be about the strongest dark; they can produce any tone between the two with enamel; and, having thus the whole gamut at their disposal, they can, if they choose to use it, so emphasise, say, the Twelve Apostles, make them so pugnaciously emphatic, that no other form of decoration is left with a leg to stand on.

This facility for realism is full of danger, and, as a fact, has some very deplorable results. One is that the patron is satisfied with it,—looks upon glass as the proper medium for great pictorial compositions; the consequence being that if he wants such in his church his thoughts instantly turn to a window,—always a window, — and not half often enough to a fresco, an altar-piece, a reredos, or a piece of beautiful sculpture. He will have a fine east window,—by an artist, if he can get it,—and stick under it a cheap altar by some manufacturing firm who care not two straws for art. Just think for a moment how this reverses the right order of things. What is the use of a window? To see through, or,—and particularly in the case of a church,—to see by. To see what by? Why, the very thing that you would thus cause to take the second place to it, the ministry of the pulpit, or the mystery and sacrament of the altar and the font. When, therefore, you go to a church, and see "window" instead of seeing "church," be assured that, whatever may be the defects of the church, the windows are all wrong.

Another unfortunate result of this custom of making windows into realistic pictures is the effect it too often has, in my poor opinion, upon the artist. He finds that the glass will do all he wants to emphasise his heroic figure compositions, and he proceeds to design such with the full unrestricted liberty of the pictorial artist. He gradually thinks more of his figures and less of ornament; designs his groups without regard to the architecture of the church; throws away all the lovely opportunities which plan affords for re-echoing the character of the carved ornament of the church in another material, striking, as it were, a graceful and delicate variation on the original melody in another key, until at last he makes an entire composition, as if mullions and tracery bars did not exist; his angels plunge about from one lancet to the other, and the whole thing looks like a sort of sacred "transformation scene" in the air outside the window, — "a splash through a tracery," as an architect friend of mine once called a window otherwise beautiful enough.

But are not the windows, then, of King's College Chapel, Cambridge, for example, beautiful? And are not the later ones so unrestrained in their full development of pictorial composition as to lead us to feel that the artist might well have worked even under the influence of Raphael himself? Yes, when you have deciphered the composition you find it so; in itself it pays no respect to the architecture, but all that you see without this deciphering is a hap-hazard mosaic of colour. You don't see big, outlined masses asserting themselves with pictorial distinctness; the composition is there, but so disguised are even the main lines of it that they have to be, as I said, deciphered, and I question whether there's an undergraduate in the college, perhaps hardly a graduate, who knows so much as what the subjects are of all the windows.

Well, but you will say, "Surely this is unreasonable. Can there be any merit in telling a story and deliberately making it barely intelligible?" Well, admitting that I like the older Dureresque window the best, my answer still is, "Yes,—to achieve a greater good." "What good in this particular instance?" Superb beauty of colour, and most noble and modest subservience to the architecture; the whole result being so solemn, and, if I may use the word, so holy, that the mystery in it is almost felt to be like the mystery of the scriptures themselves, to be reverenced, studied, and only gradually understood; and in the meantime it has the same effect as that mystery has upon the mind; instead of getting weary of the windows from familiarity, one might worship under their "dim, religious light" every day of a long life, and know that one could hardly even then have penetrated to the depth of all their lovely harmonies. The truth is, that whether a window is arranged severely in harmony with the lines of the architecture, or whether the composition is as free as that of Raphael, there should always be mystery, and depth of mystery; it should not, the moment you enter the church, shout out all it has to say to you with the explicitness of a pictorial advertisement.

I have thus endeavoured to show you how stained-glass is produced. I have now, though it is not a task I like, to tell you something of the conditions under which it at present is produced. The first, and dominating one, is that of competition,—alas! mainly commercial, not artistic, competition. The Gothic revival of fifty years ago was started by religion and enthusiasm, and carried on by genius. But there was "a little rift within the lute" which has made the music pass into discordance,—a flaw in the panoply through which has been dealt the mortal wound. The reformers founded their action only on the past and its traditions,—what had been should again be, and all would be well. Commercialism saw the open gate, and welled in like the flowing of the tide.

The consequence is that now, not stained-glass only, but all forms of decoration are very largely produced upon commercial principles only; not without skill, indeed, of a kind, because there must be something to show for the money; but without originality, without imagination, without freshness and enthusiasm, and, most of all, without the most essential of all,—self-sacrifice, without which no true work of art was ever produced, or ever will be or can be, and with this kind of "Art" cut down to the lowest possible margin of profit by competing firms. The true artist, with all those qualities burning in his soul that the other lacks, must enter into the lists and find, if he can, a profit margin *within* the business one to cover the devotion which he lavishes on his work for the sake of love and duty. We do not hear of this. An artist makes light of these things; it is his business to accept self-sacrifice and his privilege; he is satisfied to do so without talking about it. But since I have been asked to speak to you about one branch of Art, it is a part of my duty to tell you how it is produced, and what it is quite likely you may buy when you buy a stained-glass window or a piece of decorative art of any kind.

First, unless you have given a very unusual subject, it is much more than probable that the figures will have been used perhaps a dozen, perhaps a score or thirty times, and very possibly copied from an old missal to begin with. Second, that all the ornament will have been borrowed from old sources, and the whole treatment founded on old methods and old modes.

Are we not beginning to be sick of this? Do we not begin to be weary of these sermons of the thirteenth and fourteenth century, edited for us by a brisk nineteenth century publisher, who does not believe a word of them? And even if they were the originals themselves, preached by the original preachers, you would let them remain where they are with reverence in the old church, but if you were starting afresh with a new one, would you be content to sit down with the admission that, while science has advanced, your religious and artistic sentiment has been stereotyped, and that for the needs of your own age they have nothing to say for themselves, except to repeat what they said in the days when men were searching for the elixir of life and the philosopher's stone, and the world was currently believed to be flat, and the centre of the universe?

Do I despise the past, then? Not so! and if one could hear its true voice, one were wise to listen. But do you imagine you will catch the spirit of those old artists by copying their method? They had but one method, and that you never copy,—to speak straight to the heart of their own day and to its needs, in language natural to it.

I have said that a figure would be repeated twenty or thirty times. I am not speaking rashly; I know definite instances of repetition to at least that extent. I will now tell you why.

Sad though it is, it is only by this practice that a living can be made out of stained glass at all. The practice is universal, and trade firms, competing with one another, have based their scale of charges upon it. It is understood that a profit-margin only exists by using the cartoons again and again. In a paper read at the late Art Congress at Birmingham, Mr. Blomfield, the architect, complained of the commercially-minded architect, with his "stock mouldings and stock sections and details;" but what do you think of the commercially-minded painter or sculptor, with his "stock" Apostles and Prophets, stock Faiths, Hopes, and Charities, stock Last Suppers and stock Last Judgments? We have often heard with a thrill the august mysterious names of the princes of the Angelic Hierarchy, but what do you think of the new member of the heavenly choirs, to whom I was introduced the other day, bearing the portentous title "Angel No. 16"? What chance would my poor "St. Michael" here have against *him*,—in commercial circles? And now, in order to show you what sort of thought goes to the making of a work of art when an artist who works for love sets himself to deal with it, I, who certainly work for love, however feebly, will briefly presume to describe to you the imaginative intention of a window of my own which I have brought here for you to look at. I must be so egotistical, because, though (in spite of the untoward conditions I have described) I know two or three men whose work I should prefer to show you as models of what should be, I should not dare to think I had sounded the depth of their poetic thought, or that I had the right to try and convey it to you in words.*

THE PUBLIC HEALTH (LONDON) LAW CONSOLIDATION AND AMENDMENT BILLS.

The following are the most salient portions of the report presented by the Sanitary and Special Purposes Committee to the London County Council at a recent meeting, as already mentioned by us. The report, as already stated, is the result of the deliberations of a joint Committee consisting of representatives of the Sanitary Committee, the Housing of the Working Classes Committee, and the Parliamentary Committee:—

"The objects of the Bills are to consolidate into one statute the various enactments relating to the public health and sanitary administration of London, now contained in about twenty-nine Acts of Parliament commencing with Michael Angelo Taylor's Act of 1817; and to so amend and supplement the consolidated provisions as to lead to a comprehensive system of sanitary administration so essential to safeguarding the health of the inhabitants.

Under the Public Health Act of 1875, the country generally has had the benefit of a fairly complete system of sanitary administration; but London was omitted from the operation of that Act, so that such imperfect measures as the Nuisances Removal Acts and the Sanitary Acts, which have long been repealed so far as the rest of England is concerned, remain in force in the metropolis alone. This anomaly will now be remedied, and the sanitary provisions which are scattered through the Metropolis Management Acts, the Police Acts, the Diseases Prevention Acts, and a large number of other Acts, are now gathered up into one statute, properly arranged, and made consistent.

The proposed Consolidation and Amendment Bills do not, however, deal with the whole subject of public health law in London, inasmuch as such subjects as the disposal of sewage, water supply, hospitals, highways, and streets, the provision of markets and abattoirs, factory regulations, bake-houses, common lodging-houses, &c., are still dealt with by separate statutes, all of which it may be hoped will, as soon as practicable, also be consolidated and amended.

The law relating to nuisance in London, and to sanitary matters generally, is at present mainly put into force by the Vestries and District Boards; but the Police, the Metropolitan Asylum Managers, and other authorities, are responsible for enforcing many of its provisions, and in some respects, undesirable as that may be, perform some of the functions of a sanitary authority. Much of the present law is also permissive, and the general result is a want of uniformity and effectiveness which is notorious, and of which instances frequently occur.

It will be remembered that a Consolidation Bill was, at the instance of the President of the Local Government Board, prepared last year, and that the Council at his request submitted to him a series of recommendations, 110 in number, for its amendment. The Council will be glad to know that nearly the whole of these recommendations have been incorporated in the present Bills, the only material ones not so adopted being those referred to at the end of this report.

The following are the more important amend-

* To be concluded in our next.

ments included in the Bills. The Bills propose to remove a serious difficulty in sanitary administration by extending the power to deal with anything which is a nuisance or 'injurious' to health, to anything that is 'prejudicial' or 'dangerous' to health. This largely widens the general scope of the Act, as it will no longer be essential in putting the law into force to prove injury to health. It has been sometimes found impossible to prove to the satisfaction of the court that even an admittedly serious nuisance was injurious to health. It will be now sufficient to show, in order to enforce the abatement of a nuisance, that such nuisance will endanger health, and any person will now be able to give information of a nuisance, while hitherto only the person affected by it has been in a position to do so.

Additional powers are also given for dealing with trade nuisances by widening the definition of offensive trades, and sanitary authorities are themselves made liable if they cause nuisance in the removal or destruction of refuse; and for the purpose of enforcing these provisions the Council is deemed to be the sanitary authority.

The power of requiring proper water-closet accommodation in buildings is enlarged, and the Council is authorised to make, and the sanitary authority is required to enforce, by-laws with respect to water-closets, earth-closets, ashpits, and cesspools, and the proper accessories thereof in connection with buildings, whether erected before or after the passing of the Act, and for their being supplied with water. The law as to unsound food is extended, so that all persons responsible for the preparation of such food for sale, and for selling it, can be punished. The Bills make it a nuisance when a house has not proper water supply, and provide for closing it. They also require that before a new house can be inhabited the sanitary authority shall be satisfied with the water supply provided. . . .

Underground rooms are also dealt with, and where two or more underground rooms are occupied together, each of them is to be deemed to be separately occupied so as to be liable to the provisions of the Act. Mortuaries are to be provided in every district by the sanitary authorities; and where required by the County Council, rooms must also be provided for the holding of *post-mortem* examinations; and permissive power is given to the sanitary authority to provide rooms for the holding of inquests, to the cost of which the County Council may contribute.

The sanitary authorities are also required to appoint qualified medical officers of health and a sufficient number of sanitary inspectors; and on a representation from the County Council that the sanitary authorities have failed to appoint such inspectors, the Local Government Board may by order compel them to do so.

It is also proposed to transfer the execution of the Smoke Acts from the police to the sanitary authority.

Lastly, the Bills place very considerable additional duties and responsibilities upon the Council, and these include the making of by-laws for the prevention and suppression of nuisances, and for other matters; the licensing of knackers' premises; and the duty of acting with respect to the removal of any nuisance, the institution of any proceedings, or the enforcement of any by-law where the Council is satisfied that the sanitary authority is in default. There is also the further duty of making a representation to the Local Government Board when the sanitary authority is in default in executing any duties. That Board will then be able to make an order, which may be enforced by *mandamus*; or the Board may appoint the Council to perform the duties as to which the sanitary authority is in default

A few of the recommendations made by the Council last year have not been incorporated in the Bills, and some of these we think of sufficient importance to make it desirable that the Council should again endeavour to obtain their adoption. We have accordingly included them in the suggestions for the amendment of the present Bills which we have prepared, and which for the sake of convenience we have arranged in tabular form in a separate printed document, and submit herewith.

The remaining recommendations made last year by the Council, and not adopted in the Bills, include one for incorporating some of the provisions of the Metropolis Management Acts which relate to sewers and drains, but as such provisions appear to be outside the scope of the present Bills, we do not propose to again press the suggestion. The Council also made some suggestions relating to infectious diseases, to the supervision of common lodging-houses, and to the regulation of houses let in lodgings, and these also have not been adopted.

The Council's request for a general power to make by-laws for the prevention and suppression of nuisances in the County, and for regulating any matters necessary for the health and good sanitary condition of the County, has been partially complied with by section 9 of the Amendment Bill, which will enable the Council to make by-laws for preventing certain specified nuisances.

The President of the Local Government Board is to be congratulated on the able measure he has prepared, which we believe will be the means of improving the health and comfort of the inhabitants of the county."

The suggestions referred to in several instances simply consist of substituting the word "shall" for the word "may." For instance, in clause 76 of the Consolidation Bill, page 39, line 26, the Council propose this substitution. The clause, as it stands, provides permissively for making by-laws for the registration of houses let in lodgings; but, as the Committee say in their "remarks" on the suggested substitution of "shall" for "may" in this case, "there is no reason why the by-laws should not be made. Sanitary authorities can in the by-laws give themselves a discretionary power as to the houses to be registered."

In regard to the Amendment Bill, the Committee suggest the substitution of the word "dust-bin" for "ash-pit" in clause 8, and throughout the Bill, on the ground that "ash-pits" (as usually understood) do not exist in the metropolis. In paragraph *b* of clause 9, the Committee suggest the substitution of the word "premises" in lieu of the words "manufactory, brewery," &c., so as to make the clause as comprehensive as possible. To sub-section 1 of Clause 22, which relates to the power of the Sanitary Authority to provide public sanitary conveniences, the Committee suggest the addition of the following words:—"And such section [sec. 68 of the Metropolis Management Act, 1855], shall also extend to the provision of conveniences below the level of the ground." These words are suggested because the Council has been advised that there is some doubt whether the Sanitary Authority now have power to provide underground conveniences. In Clause 33, sub-section 4, the Committee suggest the substitution of the word "every" for "any," and the substitution of the words "shall," &c., for "may," so that the clause will read "*Every* sanitary *shall*, if required by the County Council, provide and maintain in connexion with a mortuary or a building for the reception of dead bodies for *post-mortem* examination proper accommodation for the holding of inquests," &c. In Clause 34, which relates to underground-rooms, the Committee suggest the addition of the following words at the end of line 33, viz., "which shall be not less than 2 ft. above the surface of the ground nearest to such window." The clause as it at present stands in the Bill prohibits the letting or occupation of any underground room which was not let or occupied separately as a dwelling before the passing of the Act unless (among other requisites enumerated) it possesses "one or more windows opening directly into the external air with a total clear area of the sash-frames equal to at least one-tenth of the floor area of the room, and so constructed that one-half at least of each window of the room can be opened, and the opening in each case extends to the top of the window." The words suggested by the Committee, and just quoted by us, are intended to be tacked on to the end of this provision. Several other suggestions consist of proposals to insert the words "County Council" in lieu of the words "Local Government Board."

The suggestions were approved, and the Joint Committee was authorised to submit the same to the President of the Local Government Board.

THE ARCHITECTURAL ASSOCIATION VISITS:

THE IMPERIAL INSTITUTE.

The seventh sessional visit took place on the afternoon of Saturday, May 9, and was largely attended by members interested in the buildings of the Imperial Institute, and the designs of the architect, Mr. T. E. Collcutt. The buildings will soon be completely roofed in, and parts of the interior have been pushed forward sufficiently to accommodate a large portion of the staff which in future will occupy the premises. The building is hardly in as interesting a state as it shortly will be, as the interior fittings are not yet in their place, and the elevations are still mostly obscured by scaffolding, so that it is difficult to form much opinion of the ultimate effect. The central tower is gradually rising above the level of the roof, and for this work an ingenious interior scaffolding is being used, which is raised bodily by means of four screw-jacks, about 2 ft. at a time, as the work proceeds. This building has been previously illustrated and described in our pages.

Illustrations.

CENTENARY HALL, BATTERSEA RISE, S.W.

This is an illustration of a portion of the important additions to the Royal Masonic Institution for Girls, recently opened by H.R.H. the Prince of Wales, who was accompanied by the Princess and her daughters, as a commemoration of the centenary of its foundation and to the memory of Chevalier Ruspini, its founder, in 1788.

It is a red brick building, with Bath stone dressings, having deep buttresses on each side, which are utilised by enclosing nearly the whole depth of buttress, with a wall to the height of 20 ft. from the floor, thus forming deeply-recessed bays, with a fireproof floor inserted about 10 ft. high, and projecting over each bay into the hall. This is approached by a turret-stair at each angle, the buttresses being pierced at this level to form an ambulatory as well as galleries in the triforium, connecting the main gallery with the Minstrels' gallery, and encircling the building.

The dimensions are 104 ft. 6 in. long by 40 ft. 6 in. wide between the main walls, arcaded in seven bays, and 50 ft. high from floor to the centre of the elliptical ceiling, supported by deep coves on each side, formed with modelled fibrous plaster, carried by a light iron-framed and truss roof, designed by Mr. H. G. Huxley, C.E.

The walls are lined to the height of 12 ft. 6 in. with a teak dado and balustrading to gallery-fronts, executed by Mr. T. Gibbons, of Dunmow. The windows are all filled with stained glass, containing in cartouches the shields of the various subscribing lodges, with the exception of the large west window, which, being the gift of the Grand Lodge of England, contains the portraits and shields of the grand officers, with panels representative of the Virtues, &c. This work has been executed by Mr. Ed. Frampton, of Buckingham Palace-road. The heating and ventilating work has been executed by Messrs. Haden, of Trowbridge; and the general contract was carried out by Mr. B. E. Nightingale, of Albert-embankment, Mr. Wm. Tookey acting as clerk of works, the erection of the hall being under the superintendence of Mr. Fred. G. Knight, architect.

The whole of the works were under the immediate superintendence of Messrs. Henry Arthur Hunt and Ralph Clutton, the honorary architects of the institution.

The drawing, by Mr. F. G. Knight, is now hung in the Royal Academy Exhibition.

CAMPANILE, ZARA CATHEDRAL, DALMATIA.

This is the drawing, No. 1,734 in the Royal Academy Exhibition, referred to in our last notice of architecture at the Royal Academy. This is the second design which the architect has made for completing this tower, the first having been exhibited at the Royal Academy in 1889, and published in the *Builder* for May 25 of that year. A full description of the history of the tower, and of its present state, communicated by Mr. Jackson, was published along with that illustration, and to this we must refer the reader for details. We may just mention again here that the tower is ancient up to the string course just clear of the cornice of the church; it has never been carried further, and the remainder is Mr. Jackson's proposed completion.

The first design, it appears, contained some features which provoked criticism from the Central Commission of Art and Ancient Monuments at Vienna, to which all designs dealing with historical monuments have to be submitted. An entirely new design was therefore made, which is the one here shown.

The original design contained two new stories only below the parapet, above which was an open octagonal lantern with large pinnacles standing free at the angles, and a short stone spire over. In the present design it will be seen that the octagon lantern is omitted; there are three new stories below the parapet, and the short spire rises directly from the parapet level.

BUNGALOW HOUSES.

The house entitled "A Bungalow" was designed to be built near a village on the south coast. The walls would be faced with local





DESIGN FOR THE CAMPANILE FOR THE CATHEDRAL, ZARA, DALMATIA.—Mr. T. G. Jackson, Architect.

(As modified from the original design, published in THE BUILDER, *of* May 25, 1889.*)*

No 1734, Royal Academy Exhibition, 1891.

ST. MATTHEW'S HOUSE, CLAPTON
NEW PARISH ROOMS



Arnold Mitchell
Architect
16 Finsbury Circus E.C.


PRINCIPAL FLOOR
LOWER GROUND FLOOR

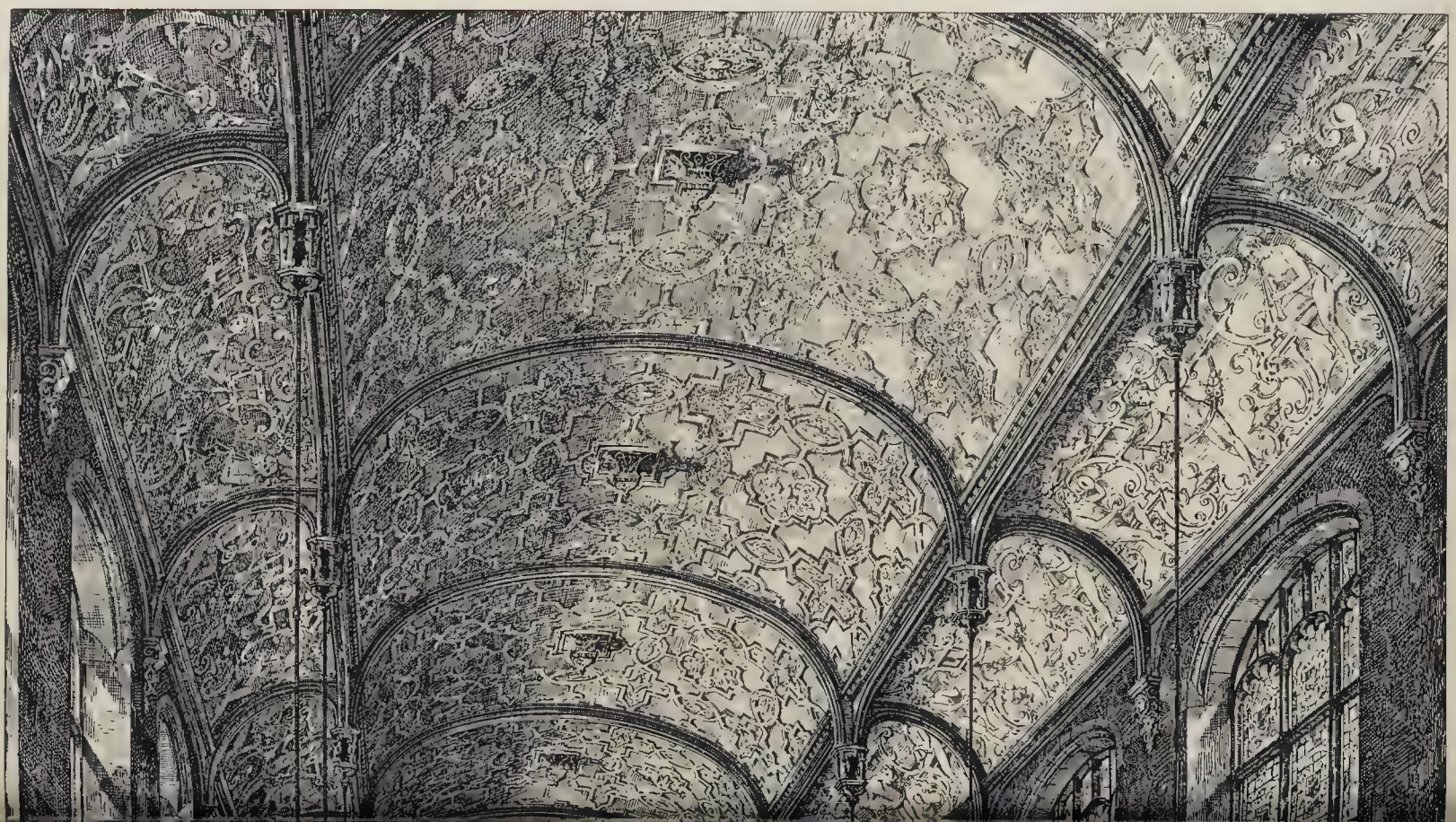


A BUNGALOW — Mr. R A. Briggs, A.R.I.B.A., Architect.

No. 1754, Royal Academy Exhibition, 1891



No. 1748, *Royal Arcade of Exhibitors*, 1891





No. 1796, Royal Academy Exhibition, 1891.

stone, and the roofs covered with patent pantiles. The woodwork throughout will be painted white. The other drawing, "Proposed Bungalow House, Surrey," shows a picturesque design of different character. The illustrations are both from drawings by the architect, Mr. R. A. Briggs, which are hung in the Royal Academy Exhibition.

ST. MATTHEW'S PARISH CHURCH ROOMS, CLAPTON.

THIS design was selected, in a limited competition, the plainer brick design being carried out. The work has been executed by Messrs. McCormick & Sons, of Canonbury, under the direction of Mr. Arnold Mitchell, the architect. The original drawing is now hung at the Royal Academy Exhibition.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION (LONDON).—At the last meeting of the Advanced Class of Construction and Practice a paper was read by Mr. J. W. Hall on the "Chemical Analysis of Building Materials." Messrs. Satchell, Yates, Taylor, Collins, Beale, and Goldsmith (Chairman) took part in the discussion, and Mr. Oswald Hamilton (who attended as deputy for Professor Watson Smith, of University College) apologised for the unavoidable absence of that gentleman, and gave some valuable demonstrations of analyses of mortar and examples of the various proportions of materials he had found therein. The officers nominated for next session were Messrs. F. T. W. Goldsmith, Chairman; S. B. Beale, Vice-Chairman; and C. H. Brodie and W. Henry White, honorary secretaries.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At a meeting of this Association held on Tuesday last, the President (Mr. T. Naden) being in the chair, the following gentlemen were elected as officers for Session 1891-92:—President, Mr. W. Hale, F.R.I.B.A.; vice-president, Mr. F. Barry Peacock; hon. treasurer, Mr. C. E. Bateman; hon. librarian, Mr. H. Beck; hon. secretary, Mr. H. R. Lloyd, A.R.I.B.A.; Council: Messrs. W. H. Bidlake, M.A., A.R.I.B.A., W. Doubleday, W. Hawley Lloyd, T. Naden, H. Rawson Bewlay, H. Buckland, and S. F. Harris. At the conclusion of the business a paper on "Oxford and the Neighbourhood," was read by Mr. W. Salt Brassington, who gave an exceedingly interesting description of many of the most noteworthy of the buildings of the city and district. After briefly dealing with the legends and facts of the early history of the city and University, Mr. Brassington proceeded to describe the points of interest to which he wished to draw attention in the churches and colleges of the city, illustrating his remarks throughout by the aid of very numerous excellent lantern views, among the examples thus chosen being the Cathedral, the Church of St. Mary Magdalen, Iffley Church, the Church of St. Giles, the Chapels of Merton, New, Brazenose, and Keble Colleges, parts of Christ Church, Oriel, Worcester, Balliol, All Souls', and Trinity Colleges, the garden front of St. John's College, the "Tom" Tower, the Tower of Magdalen, and the Pugin Gate at the last-named college. In concluding his paper, Mr. Brassington commented severely on the character of much of the nineteenth century architecture of Oxford, especially protesting against the "Queen Anne" work which has been introduced, and regretting the replacement of old work by modernising the cases of Balliol College and the Keble Gate. A hearty vote of thanks to Mr. Brassington, accompanied by considerable discussion of the latter part of his paper, brought the meeting to a close.

CARDIFF ARCHITECTS' SOCIETY.—On the 11th inst., at the Town Hall, Cardiff, before the Cardiff Architects' Society, a lecture on the "Architecture and Costume of the Fourteenth Century", was delivered by Mr. T. M. Lockwood. The lecturer was aided in his comparisons of the architecture and costumes of that period with those of the present day by a number of sketches.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting of this society took place on Tuesday evening, at the School of Art, when Mr. Innocent, Vice-President, presided, in the absence of Mr. Fowler, the retiring President, who was in London. After general business, the secretary's and treasurer's reports were read and adopted. They showed the society to be in a flourishing condition. A ballot took place for the election of president, officers, and council for the coming year. Mr. C. J. Innocent was elected President; Mr. C. Hadfield, hon. secretary; Mr. J. B. Mitchell Withers, treasurer. Council:—Messrs. Flockton, Fowler, W. F. Hemsoll, W. H. Lancashire, and W. C. Fenton. Mr. Paul Waterhouse, M.A., of London, read an interesting paper on "The Rising Generation of Architects." In opening, Mr. Waterhouse drew attention to the remarkable signs of the times in the architectural world. Referring to the much-debated subjects of registration, examination, and education, and to the special conditions of the present age, as exemplified in the public interest in architecture, and the energy of landlords in improving their estates, he augured that it was something more than curiosity which prompted an inquiry into the future. Architects were beset by new, and, in some respects, embarrassing conditions; much greater knowledge of special branches of science was required of them now than formerly. The present age was typified by an unusual catholicity of style, and they had also to face—in the great increase of numbers in the profession,—a problem which was at once an encouragement and a difficulty. He did not wish to deal with the registration question except to express a conviction that whether the profession become a close one or not, the existence in the future of a large body of examined architects could not fail to influence the public in their choice of a professional adviser in architectural matters. He felt, with regard to the disputed value of examinations, that the recent attack had been greatly misdirected, and that in some respects the outcry against examination of artists amounted to a supposed theory that the test of an artist's value (be he architect or painter) lay in his own opinion of himself. Surely it was an absurdity to suppose that it was beneath the dignity of any artist to submit himself to the critical judgment of others, especially if that judgment were confined to the more material or technical aspect of his art. Turning to the wider question of architectural education, the lecturer urged a plea for more extended education in the highest sense, both at school and in after life. He admitted that in its ideal state a perfect pupilage in a perfect office would be the best technical training; he advocated, at the same time, the recently-extended methods of the Architectural Association and of kindred bodies, and hoped that in the future architects might be so happily circumstanced as to make their education something more than technical, and their interests more than professional. He feared that the hurry of the age and the pressure of modern work so narrowed the studies of architects that they compared but ill with the larger minds of the past. After some remarks on the subject of style, in which he specially assailed the modern struggle for originality at any price, and suggested that the worst architectural errors of the day were not errors of insipidity or servile imitation, but rather unnatural strivings after capricious invention, he gave a few minutes to the discussion of overcrowding in the architectural ranks, and drew the attention of some of the "unemployed" to the real need of good literary writing on architectural subjects, a pursuit against which he considered there was an unnatural prejudice. Mr. Waterhouse concluded his remarks by expressing the hope that his words, though hardly prophetic, might have in some way stimulated serious thought about the needs of the future.—On the motion of Mr. J. B. Mitchell Withers, seconded by Mr. C. M. Gibbs, and supported by Messrs. C. Hadfield and H. W. Lockwood, a vote of thanks was accorded to Mr. Waterhouse for his interesting paper.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The Edinburgh Architectural Association visited Penicuik and district on Saturday last. The weather was all that could be desired, and the gathering of members was very large. Reaching Penicuik by train, the party drove in brakes to Newhall House, tenanted by Mr. John Blair, W.S, from whom and Mrs. Blair the party received a very cordial greeting. The leader of the party was Mr. Hippolyte J. Blanc, who explained that the present house was the outcome of many alterations and enlargements from the simple, but dignified, Hall House of the middle of the 17th century to the more commodious residence created by the increased requirements of modern times. The existing house, he explained, had supplanted in 1646 the earlier feudal residence of the Creichtounes,—a branch of a family well known, and of considerable influence in Midlothian during the preceding three centuries. Their castle had, in its turn, supplanted a pre-existing monastery which occupied the same site, and reminiscences of which may be still traced in the names of neighbouring places,—such as Monksburn, Monkshaugh, Monksrig, Monksrood, &c.,—and, further, in the name of Spittal Farm, which suggests the existence of an hospital in connection with the monastery. From illustrations, photographed and enlarged from old prints, the form and dimensions of the house when first built were shown, and, by the aid of a plan lent by Mr. Bryce, architect, the progressive building changes were traced out. Mr. Blanc explained that the estates became possessed by Alexander Pennicuick, father of the well-known author, poet, and physician of the same name, who succeeded him in 1652, and that, after several changes of owners, they passed into the hands of Sir David Forbes, distinguished alike for his taste as for his legal knowledge. Very early in the eighteenth century Sir David cleared away nearly all the castle, and began the present house, and, with his son and successor, John, of like taste, had it richly furnished with tapestries, and the walls and ceilings elaborately painted with representations of classic subjects. The succession of owners was traced to the present proprietor, Mr. H. F. Brown, and in closing the notice of the architectural features of the house, Mr. Blanc referred to the great interest it possessed as being the chief scene of Allan Ramsay's delightful pastoral poem, and where many a happy meeting took place of the distinguished literati, who, under Sir David Forbes and Dr. Pennicuick, assembled to hear the first of Allan Ramsay's verses. References were also made, by quotations, to the localities surrounding the house from which the various scenes in the poem were taken. Mr. Blair then conducted the party over the gardens, where were viewed some sculptures, and two interesting sundials, one of which is attached to an obelisk erected in 1810 in honour of Allan Ramsay. The interior of the house was examined, and the "Portrait Room" visited, in which is collected a very interesting series of paintings of those who were wont do assemble with Allan Ramsay to hear him recite his poem. The portraits are chiefly by Aikman, and are in excellent preservation. Mr. and Mrs. Blair having been thanked for their kindness and for the privilege extended to the Association, the party next proceeded to Brunstane Castle, a ruined fortalice of the sixteenth century. The remains show the internal dispositions of apartments fairly well, and some interesting features of construction belonging to the period were pointed out. Mr. Blanc explained that this had been originally a possession of the Creichtonnes, who held the lands adjacent since 1373, from David of Penicok. The original castle was burnt to the ground shortly before the Reformation, the proprietor being attainted for high treason, and in 1568 the present edifice was erected by John Creichtonne, a son of the attainted owner. The estates passed out of the hands of the family of Creichtonne in 1609. Continuing the route by the valley of the North Esk, the party next reached Penicuik House. Here Mr. Blanc explained the mansion-house in plan and exterior elevations, tracing at the same time the line of proprietors of the estates after the Pennicuicks to the first of the distinguished family of the present proprietor, who purchased the estates in 1646. The present house, he explained, was the outcome of a design by Sir James Clerk, the third Baronet, who erected it in 1761. But a study of the detail, combined with a knowledge of the fact that the distinguished architect, Robert Adam, was by marriage related to the proprietor, led, Mr. Blanc thought, to a conviction that Adam must have been largely consulted during the progress of the work. The interesting relics, the Queen Mary missals, and the Roman antiquities were viewed in the hall, and also the valuable collection of portraits by Aikman, Raeburn, and others in the dining and other rooms. The chief apartment of interest, however, is the drawing-room, a handsome, lofty room, built as a picture-gallery, and now known as Ossian's Hall, from the splendid ceiling-paintings by Alexander Runciman, illustrative of passages in the poems of Ossian. A most instructive and enjoyable afternoon was spent, and Mr. Blanc was duly thanked for his interesting papers.

GLASGOW ARCHITECTURAL ASSOCIATION.—At the usual monthly meeting of this society a paper was read by the President, Mr. William J. Anderson, entitled, "An Architect of the Sixteenth Century: His Work and Times." Baldassare Peruzzi, the subject of the notice, lived 1481-1536, and therefore belonged to the second period of the Italian Renaissance. Of this phase of the style he is the master, though his works are but few in number and by no means imposing in size. In excellence of proportion and detail, however, they are full of interest. The architect was also a painter, but not of first importance, and but few samples are extant. Mr. Anderson was able to show an almost complete series of his architectural works by photographs specially obtained from Italy, by prints, sketches, and measured drawings. At the close of his paper, after discussion and criticism, a hearty vote of thanks was awarded him.

THE ARCHITECTURAL ASSOCIATION
SOIRÉE.

THE annual *soirée* of the Architectural Association was held on Thursday, the 7th inst., in the Westminster Town-hall. The entertainment consisted of a "musical burlesque" entitled "At Loggerheads; or, Romeo re-versed and 'punned' into an A. A. Burlesque," written by Mr. Theo. Moore, and produced by the A. A. Lyric Club. The cast was as follows:—Romeo, Mr. A. Bramwell Thomas; McCutio, Mr. P. J. Sutton; Paris, Mr. A. C. Bulmer Booth; Tybalt, Mr. H. O. Cresswell; Monty Cute, L.C.C., a builder, Mr. E. Wonnacott; Capulet, F.R.I.B.A., D.S., &c., Mr. Harry Sirr; Peter, Mr. W. Henry White; Balthazar, an advertising agent, Mr. Theo. Moore; Juliet (architectonic personification), Mr. Frank Galsworthy; and Nurse, Mr. C. H. Brodie. The first scene of Act I. was supposed to be laid at Verona, and discovered Tybalt and Paris, Romeo and McCutio, all four architectural students of Verona, discussing the educational and examination questions. Scene ii. opened in the hall of a well-known museum, disclosing the Nurse (typifying the leading architectural society) interrogating her private secretary,—whose "make-up" was evidently aimed at the representation of a well-known official—as to the issue of invitations to the "great triennial swarry." Among the guests who now arrive are Capulet, Monty Cute, Juliet, and the Nurse. Monty Cute, after conversing with Capulet for a little while, asks, "Who's the girl there, with the sleepy matron?" Tybalt, overhearing, exclaims:—

> "Oh do not all the arts combine to gild her?
> Our stately Architecture! You, a builder,
> Are never like to know her!"

Capulet is asked by Monty Cute to introduce him to the lovely Juliet, but he demurs on the ground that he "does not know her well." In Act 2, scene i., there is a little skit on the examination. Capulet is the examiner, and one of his questions is:—"Describe a dog-iron, and a dog-leg stair, and say whether they have any connexion with Canina?" Afterwards McCutio becomes assistant to Capulet, who patronisingly allows him to have the use of his library, which consists of a few out-of-date books, and a well known catalogue of iron castings, which Capulet says he always uses "in designing ornament." These books, he tells McCutio, will be more useful for study "than the list of books recommended by the Institution." "Which," says McCutio, "they seem to have confounded with their library catalogue." In scene iii. Monty Cute and Capulet meet, and after exchanging greetings, Monty Cute explains that he has just come from the County Council, where he has carried his proposition that District Surveyors must not practise privately, confidentially adding that it was his aim "to get a lower class of men" to fill those offices, so that he might the better carry on his vocation as an avowedly unscrupulous builder. There was much more to the same effect.

The histrionic and vocal ability displayed by the actors was considerable, and the author was called to the front at the close of the performance. Mr. F. T. W. Miller officiated as stage manager, and most of the scenery was lent and painted by Mr. Percy D. Smith, assisted by Mr. E. Wonnacott.

"ON STRIKE."—By an oversight in our article on the Royal Academy Exhibition last week, the fine picture exhibited under this title was mentioned as the work of Mr. Fildes, instead of being attributed to its actual author, Professor Herkomer.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday last, Sir Thomas Farrer, Vice-Chairman, in the chair, in the absence of Sir John Lubbock, the Chairman, who was absent through an attack of influenza.

The Water Question.—The Parliamentary Committee presented the following report on the Water Bills now before Parliament:—

"We have had an opportunity of seeing and considering the report of the Special Committee on Water Supply and Markets to be presented to the Council on the 12th inst., and desire to express our general concurrence in its terms and in the recommendation made. The report, however, does not point out the manner in which effect shall be given to the Committee's recommendation if adopted by the Council, and, in order to make this clear, we recommend—

'(*a*) That the Special Sub-Committee of the Parliamentary Committee on the Water Bills be instructed to negotiate and enter into an agreement with the Corporation of the City of London on the following basis: the placing the control of the London Water Supply in the hands of a Statutory Committee of the Council of moderate size, on the understanding that one-eighth of the members of the committee are to be nominated by the Corporation, leaving seven-eighths to be appointed by the Council: the details of administration to be left to the Statutory Committee, but all questions of policy, terms of acquisition of the Water Companies' undertakings, charges to consumers, and finance, to be subject to the control of the Council.'

We further recommend—

'(*b*) That the Sub-Committee be authorised to submit, through counsel, the result of their negotiations to the Select Committee of the House of Commons which is now considering the Water Bills.'

We have further to report, with reference to the water question, that it has been intimated to us by the agent that more evidence from provincial towns is needed to show that the municipal system of water supply works practically and conveniently. We concur in this opinion, and have given the necessary instructions. We recommend—

'That the course taken by us in instructing the agent to obtain additional evidence of the nature above referred to, be approved.'"

These recommendations were agreed to, and after transacting other business, the Council adjourned until Tuesday, June 2.

"A NATIONAL SCHEME OF MAIN DRAINAGE."

AT the last monthly meeting of the Association of Public Sanitary Inspectors, held on the 2nd inst., at Carpenters' Hall, London Wall, a comprehensive scheme of main drainage was propounded by the President of the Association, Dr. B. W. Richardson. The attendance being very large, the lecture was given in the large hall. Among those present were Earl Fortescue, Mr. H. Stephens, M.P., Professor Hughes, Dr. Danford Thomas, and Mr. D. Chadwick.

Commencing by expressing satisfaction that certain plans which he had suggested during a long sanitary career had not been adopted because that might have impeded later and more perfect plans, Dr. Richardson said that he had kept in the secrecy of his study, for more than twelve months, a matured scheme of main drainage on a national scale, which he had refrained from making public until a long interval had passed, in order to give time for the development in his mind of objections to it. The scheme still seeming to him a good one after that long interval, he had resolved to delay its publication no longer. He had long deplored the absence of system which characterised all our efforts after sanitary improvement, and the first desideratum appeared to him to be a systematic method which could be made applicable everywhere,—a system that would be national in the strictest sense of the word. The fact that the country had already been surveyed, laid out, and levelled from end to end, with infinite skill, in the network of railways intersecting it, had struck him, and he conceived the idea of constructing along the lines of the nation's railways conduits of iron tubing or brickwork into which the sewage of populous places could be pumped for carriage and ultimate distribution to whatever spots might be benefited by the fertilising principles contained in it. The practical difficulties to be encountered were not formidable. The plan could be as easily carried out as the laying out of a new telegraph line. No line of railway would be injured, conducting tubes of very small diameter being all that would be required, except in the vicinity of the larger towns. The main being always in current towards the open country, with a minimum quantity of water to carry the solid material, every district would have its own main drain into which the local drains would run, and what was now so real a nuisance that it was cast at great expense into the sea, would then become what it ought to be,—a source of wealth readily and immediately utilisable upon land languishing for it. In the largest towns there would be numerous stations, not storage depôts, but starting-points, and the necessity for enormous sewers, even in London itself, would not exist. Some 150 of such stations distributed over the outer area of Greater London would receive the drainage of the houses through sewers, uniform in construction, and in unbroken continuation. The uncertain cleansing by flushing would give place to a continual exhaust, which would invariably suck in air through every gully and hole, and upward rushes of sewer-gas would be unknown. All the wants of the community would be provided for by a uniform system, and uniform rates of charges might be made which would realise the most important economies, and, at the same time, everywhere confer the advantages of equal cleanliness, health, and comfort. Working through the capillary network laid out for a different purpose, the plans were so well adapted for the new purpose that they could not be bettered even if we were to commence *de novo*. Who was to take the initiative in carrying out such a scheme? The Government, County Councils, or the railway authorities? The latter might, with the happiest results all round, take up the scheme as a profitable enterprise. In a single decade the whole country might be completely drained, and the sewage be satisfactorily utilised. Everything was ready to hand. No new line would need to be cut, or tunnel excavated, while all forms of power,—steam, wind, water, electricity,—would be available. The railway companies could best work the plan, for, while on one side of their lines carrying away sewage, they could on the other side be bringing to our towns and cities the pure water they all need from lake and spring, for with their exquisite levels, these railways already intersected every source of pure water supply throughout the country. A new industry would be thus created, and after finding new employments in every part of the country, our engineers and workmen would be called upon by foreign countries to carry out similar schemes abroad, for our national system of main drainage would be copied throughout the world, as our railway system had been copied.

A vote of thanks to the president for his paper was proposed by Mr. H. C. Stephens, M.P., and supported by Earl Fortescue.

In the course of his remarks, Mr. Stephens pointed out that the scheme proposed by the doctor would facilitate a return to the separate system which formerly prevailed, but which had long been rendered impossible, even by the working of the Public Health Acts themselves. He was not himself an advocate for such wide-reaching schemes, believing, as he did, in the superior effectiveness of more localised action.

Lord Fortescue said he was old enough to remember the outcry raised against sanitary improvement in times now happily gone by. If the demand to turn the pig out of the precincts of the dwelling-house was no longer resented as an outrage on freedom and on every Englishman's birthright of personal liberty, it was greatly due to the teachings of their philosophical president, and of his predecessor in the chair, the late Sir Edwin Chadwick, whose personal friendship he (the Earl) had had the privilege of possessing for fifty years.—The vote having been given with acclamation, Dr. Richardson briefly replied.

In advance of the public meeting a special general meeting of the members of the Association was held to receive a report of the action already taken by the Council in regard to the new Public Health Bills, and to consider what further steps might be necessary. The Chairman of the Council (Mr. Hugh Alexander) had written to the President of the Local Government Board pointing out that "while Inspectors appointed after the passing of the new Bill could be only dismissed with the consent of the Board, no similar provision was made for the protection of existing officers." The action of the Council was approved, and satisfaction was expressed that three of the points urged by the Association upon the promoters of the Bill had already been incorporated in it.

COMPETITIONS.

TOWN HALL, NEWRY, CO. DOWN.—On the 8th inst. a special adjourned meeting of the Newry Town Commissioners was held in their offices, Marcus-square, for the purpose of considering the designs for the proposed new Town-hall. The plans before the meeting bore the following mottoes:—"Caroline," "Common Sense" (No. 2), "Clanrye," and "Light and Air." The Town Clerk (Mr. R. H. Doherty) said that the Committee of Public Works had submitted the consideration of these plans to the monthly meeting of the Board, of which that was the adjournment. A report of Mr. Meares, C.E., Town Surveyor, to the Committee was then read, in which the chief features of the plans were described. On the motion of Mr. M'Cann, seconded by Mr. Marron, it was resolved to obtain the opinion of a competent architect as to the plans. Mr. Redmond then moved, and Mr. Fowler seconded, the motion that Mr. Drew should be asked to act as architect-assessor, and this was agreed to

Books.

Terres Cuites Grecques Photographiées d'après les Originaux des Collections privées de France et des Musées d'Athènes. Par A. CARTAULT. Paris: Armand Colin et Cie., Editeurs.

PROFESSOR A. CARTAULT'S researches in connexion with the subject of Greek terra-cottas are already well-known to the archaeological world. The object of his present work he states distinctly in the preface. He wishes to fill a definite literary vacuum. The public collections in the great museums of Europe are accessible both to the specialist and the general educated public, both by the fact that they are free and open to all-comers and also that their official catalogues are published for the most part at a moderate price. Private collections, when published at all, appear in large publications, "de luxe," available only to the most wealthy amateurs. In his present book, Mr. Cartault aims at giving a selection of the most important specimens in the principal private collections of France; a few from the public museum of Athens are added. The collections from which he draws are those of MM. Bellon, Secuyer, Gréan, Spitzer, Rothschild, Durufié, De Clercq, and Madame Darthès. The existence of these and other private collections have been known to the educated public since the exhibition of terra-cotta at the Trocadero in 1878. We have now the opportunity of studying not only the series of twenty-nine beautiful photogravures with explanatory text, but we have, in the introductory essays, first an admirable bibliography of the subject, and, second, a discussion of the principal problems that arise in connexion with the study. The bibliography is not a mere list, it is an admirable *orientation* of what is by now almost a pathless wilderness. It gives the main contents of the various books, the point of view of the authors, and the necessary caution when a theory is out of date. The book is not so popular in character as that of M. Pottier, which we recently noted, but just because of its frank facing of certain at present unsolved problems, it is likely to be special use to the amateur in terra cottas.

Die Griechischen Vasen mit Lieblings-Inschriften, von W. Klein. Wien, 1890. Reprint from Denkschriften der K. Akademie der Wissenschaften in Wien. Band xxix., II.

DR. KLEIN'S long-looked for monograph on the vases with "love-names" (we know of no other English equivalent for the awkward but now canonical German term, Lieblings-Inschriften) has been to some extent anticipated by Dr. Konrad Wernicke's pamphlet on the same subject, which we noticed some months ago. Dr. Klein's work is, however, by no means superfluous. Dr. Wernicke aimed rather at giving a conspectus of the principal facts connected with this particular class of vases. Dr. Klein gives a detailed catalogue, and, moreover, an illustrated one, publishing for the first time a number of hitherto inaccessible specimens, *e.g.*, we have as a frontispiece a plate from the Ashmolean Museum of Oxford, and from the same museum a beautiful white lekythos inscribed with the name Alkimedes. To criticise the work in detail would here be out of place; it is enough to say that it forms the indispensable appendix to the "Meistersignaturen" of the same scholar. The Imperial Academy of Science at Vienna enabled Dr. Klein to inspect personally the principal collections of Greece, Italy, France, the Netherlands, and England, and this book is the result. Dr. Harburg, too, placed at his disposal the drawings made for his great forthcoming work in the "Meisterschalen." Dr. Klein has wisely, in a catalogue work of this kind, made his references to the bibliography of his subject as brief as possible, only citing works of real scientific importance.

Historic Towns: New York. By THEODORE ROOSEVELT. London: Longmans, Green, & Co. 1891.

THIS is one of the "Historic Towns" series edited by Mr. E. A. Freeman and Mr. W. Hunt; and though at first thought one may be inclined to wonder how New York should have a claim to be included among a list of cities whose history is for the most part so much more venerable, yet the author makes a good case for his work. The history of New York, he says, "is the history of the largest English-speaking city which the English conquered but did not found, and in which, though the English law and governmental systen have ever been supreme, yet the bulk of the population, composed as it is and ever has been of many shifting strains, has never been English." The book many serve to remind us of what many of us have forgotten, that the city on Manhattan Island was really of Dutch foundation, and dates just two centuries and a half back. New Amsterdam was its original name, at the time when the greater part of Manhattan Island was still a tangled waste, and its small white population fighting for life with the Indians. It was in 1664 that it passed into the hands of the English, by the mere right of greater power; and the expedition which took it having been organised under the patronage of the Duke of York, afterwards James II., the inchoate city was renamed in his honour. After nine years it was retaken by the Dutch, but in a year and a half again given up to the English under a treaty, in 1774, and from that time was definitely known as "New York."

The author gives a sketch of the development of the city, and of the various movements and rival interests which contended and predominated from time to time, and about the history of which there is a good deal of the petty character which is associated with the politics of a vestry; and in art and letters the author confesses "we are not yet free from the spirit of colonialism." The sketch of the manners and tendencies of New York society at the period immediately preceding the war, shows how much such a struggle was morally wanted in order to shake the inhabitants into the belief in something better than the round of commonplace life they had become contented with, the description of which winds up with this brief indication of the æsthetic of everyday life of the period.

"In the summer they all went to Saratoga or to Europe; in winter they came back to New York. Fifth-Avenue was becoming the fashionable street, and on it they built their brown stone houses, all alike outside, and all furnished in the same style within—heavy furniture, gilding, mirrors, and glittering chandeliers. If a man was very rich he had a few feet more frontage, and more gilding, more mirrors, and more chandeliers. There was one incessant round of gaiety, but it produced no variety whatever, and little interest."

The plan of the city appended to the book is characteristic. About the point of the long narrow island over which it is built there is a certain amount of variety in the alignment of the streets; the remainder is like a vast elongated gridiron, with longitudinal lines at large distances and cross lines at smaller distances, with the "Central Park" forming a long parallelogram in the centre. A more dreary way of building a great city could not well be imagined. One wonders to find that the lake in the park, the Croton Reservoir, is left with an irregular outline, and not drawn out square like the rest. We may observe that the map is without a scale.

Retrospections, Social and Archæological: By CHARLES ROACH SMITH, F.S.A. Vol. III. Edited by J. G. Waller, F.S.A. London: Geo. Bell & Sons. 1891.

THIS is the third and concluding volume of the recollections of the late Mr. Roach Smith, which he did not live to see published, but of which a considerable portion was left ready for the press, and has been edited and added to by Mr. Waller. The book is a pleasant and readable, though rather rambling record of persons and places associated in one way or another with the subject of archæology. The notes at a visit to Stratford-on-Avon in 1868, when Mr. Roach Smith gave some readings for the benefit of the Shakespearean Museum, leave one to suppose that the poet was not much honoured in his native town. The Mayor's dinner was much better attended than the "Readings," and in the course of it a then well-known member for Birmingham, who was present, was heard to observe that he "was tired of the very name of Shakespeare."

Among the more directly archæological matters of which these are notes, is the subject of the Chester walls, the Saxon cemeteries of Kent, various archæological congresses, &c. The volume includes some illustrations to notes of a tour in France, including one of the curious Roman monumental column at Cussy. There is a great deal of interesting reading in the book, on a variety of subjects not linked together by any special plan.

Correspondence.

To the Editor of THE BUILDER.

THE THREATENED STRIKE AND LOCK-OUT IN THE BUILDING TRADE.

SIR,—It seems very sad, after a long winter, when building works were necessarily suspended, that the carpenters and joiners should bring on a further suspension now by their excessive demands. The point on which they lay most stress is a reduction of the hours of labour, and the men appear to ignore altogether the fact that dark, wintry weather must be reckoned on for, at least, three months every year. If the men would calculate the number of hours actually worked on buildings during the past twelve months, and divide the total by 300 (which is about the number of working days throughout the year), they would find an average of not more than eight or nine hours per day, which cannot be considered excessive. Building is, to some extent, similar to agricultural pursuits, in which it is necessary to "make hay while the sun shines." The carpenters and joiners have, however, I am told, large subscribed funds, which, judging by past experience, I fear they will have to get rid of before they listen to reason.

A SORROWFUL LOOKER-ON.

PROGRESS IN ARCHITECTURAL RESTORATION.

SIR,—I so frequently pass the lately-restored north transept of Westminster Abbey, and look at it always with so much pleasure, that I have ventured to think my criticism of it may be of some interest, especially as I feel that we must all be proud of the progress lately made in this branch of art.

I trust my criticism will not be regarded as in any way personal, I simply write what seems to me written on the stones of the building.

It will be remembered that this restoration was commenced under Sir Gilbert Scott about twelve years ago, and has just been completed under Mr. Pearson, who was entrusted with the restorations at Westminster Hall. The porches are Sir Gilbert Scott's work, and the upper part is Mr. Pearson's. To my mind, there is no comparison between the two; the porches, as one stands close to them, although full of carvings and rich mouldings, look harsh and uninteresting to a degree, and consequently resemble a great deal of modern work (amongst other, Lichfield West Front), whilst the upper part strikes one at once as being full of interest, and as having already toned down. In my opinion, this stamps the work as some of the best of modern work (like the beautiful new piers at Peterboro' Cathedral), and it certainly closely resembles ancient work.

Now to examine the different work in detail, to endeavour to understand why they strike one so differently, why the one seems imbued with the spirit of the ancients, and the other seems modern commonplace. I think, too, such an examination will prove the architect in *Punch* to have been wrong who stated,—"I can build you a house, but only centuries of time can give it the desired tone and interest."

Examining the porches (1) as to the design of the detail.

Note how each cap of each column resembles the others; how the same leaf ornament is repeated over and over again in endless monotony round outside the doors, and exactly the same diaper pattern is plastered over the walls round the doors; how regular and exactly the same in size are all the ornaments in the mouldings, just as if they are all cast in a mould or executed by some other spiritless and mechanical process.

Examine the side doors, how fearfully monotonous is that beautifully-designed ironwork repeated over and over again, until one ceases to care about it at all.

2. As to execution.

Note how all the stones from the same quarry seem purposely chosen of exactly the same tint, how regular they are in size, how the face of all stones is covered with chisel marks all exactly the same size and inclination, how sometimes a joint between two stones comes right through the centre of a carved leaf; how the joints in the arches, &c., are attempted to be concealed.

Then as to the upper parts:—

1. As to the design of the details.

Step back a few yards so as to see that rich arcade just over the porches.

At first one notices nothing peculiar, but certainly it seems less formal than the porches. As however, one examines the caps of columns, one finds to one's surprise that some are moulded, and some are carved without any apparent regularity; that the diaper work, both above and below the arcade, is wonderfully varied, that not two pieces of carving that are near one another are anything like

similar. It is no doubt owing to this irregularity, that the work looks so full of life and interest.

Looking higher still, one notices quite a different entasis given to the different stone roofs of the pinnacles; those that are most required for weight to counteract thrust having a much bolder curve than the lighter and more graceful ones; and see what an unobtrusive ornament is at the apex of these pinnacles, then compare all these pinnacles and ornaments with the vulgar pinnacles and ornaments near the Western Towers.

2. As to execution.

I think the softness or immediate toning down of the design is produced principally by the prominence given to the joints between each stone, to the varied grades of colour, and to the different sizes of the courses of the stones. Even greater care than this is taken, for if the surface of each stone is carefully examined, one finds that the tool marks which cover the surface are also carefully varied in size and inclination—in fact, I have heard that, in order to insure variety in this particular, Mr. Pearson insists on the employment of some left-handed masons.

Then, again,—another reason for the absence of harshness in the work,—examine carefully any of the repeating ornaments placed under corbel tables, or in the mouldings, and one actually finds that they are placed at different distances apart, and are not of uniform size. This may seem to some to be faulty work, so I hasten to give a practical reason, as well as to state the fact that it is invariably found in ancient work.

As the building is built of stones of different lengths, and as no joint should come through a piece of carving, it naturally follows that the spacing and sizes of these ornaments must vary with the varying lengths of the stones. One of the most beautiful ancient classical vases in the Louvre is in the Salle des Cariatides, and it stands on a modern base. Go and examine them, and your eye at once tells you where the modern ends and the ancient begins, for you find the modern ornaments as regular as if cut out by machinery, whereas the ancient ornaments, whose beauty "has stood the test of ages," were evidently spaced out by eye only, so great is the variety between them.

This freedom with the use of conventional forms undoubtedly requires, in architecture especially, a high intellect on the part of each individual workman, together with an eye "imbued with the spirit of ancient times," to control it, and to my mind this is seen to perfection in Mr. Pearson's restoration of this magnificent North Transept.

ARTHUR CAWSTON.

13, *Queen Anne's Gate, Westminster.*

THE R.I.B.A. ELECTIONS OF COUNCIL AND COMMITTEES.

SIR,—The excessively large number of the existing Council and Committee who are nominated for re-election leads me to suggest that it would probably be to the interest of the R.I.B.A. that a fair proportion of the Council should *not* be eligible for re-election for more than two years or so.

There are no less than *eighty* members of Council and Committees seeking re-election, and it is to be hoped that the members generally will give due consideration as to the advisability of giving new candidates a proper representation at the Institute.

"SUUM CUIQUE."

The Student's Column.

VENTILATION AND WARMING.—XIX

HEATED AIR COLUMNS.

THE use of heated columns of air to promote ventilation is one of considerable antiquity in practical working, having been long employed for the ventilation of mines

There are various methods by which a column of heated air may be produced for ventilation purposes. An open furnace or fire-grate may be constructed at the base of a chimney, as is done at the Houses of Parliament, a stove may also be employed in a somewhat similar manner, or in conjunction with a sheet-metal pipe passing up the chimney; hot-water or steam-pipes arranged in coils or radiators; hot-water boilers or gas jets may also be used.

As the employment of heated columns of air to produce ventilation is almost universally directed to the exhaustion of the foul or vitiated air, the method necessarily implies the co existence of the difficulties which inevitably attend all exhaustion systems of ventilation, and which have been already discussed in speaking of draught and its prevention.

In the application of heated-air columns in order to obtain the maximum of efficiency with the minimum of expense, it is important to so proportion the height of the shaft or flue to the temperature of the moving column of air, that it shall escape at the top with no great excess of temperature above that of the external atmosphere.

Referring back to fig. 4, in chapter viii., we saw, in considering the movement of air by reason of temperature difference, that although the column of warm air, whose superior lightness to the external atmosphere causes the current, is theoretically of the height $H + h$, it is impossible to rely upon the activity of the portion h. Therefore, for the sake of economical working, it is desirable that h shall be as small as possible, and H as large as possible, or, in other words, that as much of the height of the heated column as possible shall be contained within the flue or shaft.

From this consideration we can readily understand that in ordinary cases the use of an open furnace or fire-grate is an extravagant and wasteful means of producing a heated air column for ventilation purposes. It is not every day that we have a Victoria Tower to serve as an aspirating shaft, and unless we have a considerable length of flue the temperature at its mouth will be wastefully high.

Again we learn that the proper place for our heating agent is at the bottom of our flue, not at the top, for only thus can we utilise fully the effective energy of our heated air.

The extravagance of furnaces results from the high temperature produced at the bottom of the flue by the combustion of the fuel. The temperature of the heated air as it leaves the furnace is usually above 2,000° Fahr., and it is almost impossible to effectively utilise this high temperature for ventilation.

Remembering that we have already in previous chapters found that the velocity of air currents produced by heat depends on the temperature, it may at first sight appear that the high temperature produced by a furnace would not be altogether a disadvantage. There are, however, two unfavourable concurrent factors in the problem, first that the high temperature produced is partly expended in raising that of the flue walls, for as the ratio between the temperature of the heated air and that of its enclosure increases, the proportion of the heat expanded in warming the walls of the shaft increases; again, the high velocity caused by the high temperature, results in a large part of the heated air being carried off before it has exerted its full potential energy.

The objection to the use of furnaces applies also similarly to the use of gas-burners for producing heated columns of air. These are likewise extravagant in the effect produced by the consumption of a given amount of fuel, with the additional drawback that the fuel is a costly one.

The application of gas-burners is, however, frequently so exceedingly convenient that its suitability in this respect outweighs the extravagance. This is particularly the case with domestic ventilation, where convenience is of high importance, where the amount of ventilation required is not usually very considerable, and where it is desirable to have the opportunity of readily increasing or decreasing the activity of the ventilating agents.

In utilising gas-burners as sources of heat for ventilation, the practice has occasionally been adopted of dividing the shaft or flue by sheet metal, on which the gas-flames are made to impinge, the idea being that the radiation from the heated metal surface would more effectively warm the air in the shaft. This practice, however, falls into a two-fold error. First, the heat of the gas is still more rapidly led to the upper part of the flue, and thereby some of its efficiency is lost; second, the increase of surface largely increases the friction of the air current, and thus a further portion of the useful energy is dissipated.

It should be hardly necessary to mention that gas-burners, when used solely for ventilation, should be "atmospheric"—that is, constructed like a Bunsen burner, to give the maximum of heat and the minimum of light, but it is also possible to utilise the heat generated by gas-burners primarily employed for lighting purposes. This particularly applies where sun-burners, or the large gaseliers used in theatres, are found. The heat that these necessarily throw out can be well adapted as an assistance to the ventilation.

We now have to consider the employment of steam or hot-water pipes for the production of heated columns of air.

The rule as to the location of the heating agent, which we have seen to obtain with furnaces, applies also in this case. Our coils of heating-pipes should be at the bottom of the shaft, so as to obtain as great a length of this latter as possible. The method that has been frequently employed of placing hot pipes in the roof or at other high levels is wrong in principle and wasteful in practice.

Further it is desirable that the coils should not block up the shaft, and they should, therefore, be placed in an enlarged chamber so that the free area shall be about 10 per cent. greater than the sectional area of the flue or shaft. At the same time, it is important that in this enlarged chamber the pipes should be distributed and arranged so that no air will pass without coming in contact with heated surfaces. The principles that have been already enunciated as to the length of the shaft should also be observed.

The most economical occasions for the use of steam or hot-water pipes for the purpose we are now considering will be those in which these means are adopted for the warming of a building. It would rarely be desirable to institute the necessary apparatus solely for the purpose of ventilation.

The determination of the amount of pipe necessary for any particular scheme of ventilation is a fairly easy matter, and a simple formula for this purpose has been arranged by Professor Trowbridge, of Columbia College, U.S.A., as follows:—

$$S = \frac{W T_a}{H (T_e - T_a)} \times 1500$$

Where S represents the number of square feet in the exterior surface of the coil or cluster of heated pipes at the base of the shaft, T_a is the *absolute* temperature of the external air, that is, the common or thermometric temperature + 459·4° Fahr. W represents the weight of air in pounds which is drawn off by the shaft in one second, H the height of the shaft, and T the *absolute* temperature of the steam or hot water in the pipes, that is, the thermometric temperature + 449·4° Fahr.

In using this formula it is advisable that the sectional area of the shaft in square feet should be 3 W, that is, three times the weight in pounds of the air to be drawn off. This then gives a satisfactory velocity of the air in the shaft of 5 ft. per second.

This formula is applicable whether the pipes contain steam at high pressure or low pressure, or hot water at either high or low pressure.

Motors.

We may close this chapter with a brief consideration of the various types of motor which may be employed to drive fans or other moving apparatus for the production of air currents.

These may be classed into steam-engines, gas-engines, electric motors, and water power.

The order in which these are here given fairly represents their relative efficiency in the utilisation of energy.

Steam engines are undoubtedly the most effective as compared with the cost of the fuel they consume, but they are frequently surpassed by gas engines in convenience, where a small amount of power for ventilation purposes is required. It is impossible to lay down a hard-and-fast rule which shall fit all circumstances, but, generally speaking, when not more than 5 horse-power is needed, gas engines will be found preferable; but, beyond this, steam engines should be used. Whenever steam is employed for warming, steam engines should certainly be adopted for the ventilation.

Electric motors are still more costly in loss of energy or work; but here, again, convenience may sometimes compensate for the loss. It is so much easier to convey power by electric current in a couple of wires than by steam pipes or gearing, that this will occasionally render it advisable to adopt this method when we desire to run a fan at a considerable distance from our central source of power.

Water-power will seldom be found advantageous in use for ventilation purposes, except where considerable heat is obtainable at very low cost. If we have to pay a water company for the water used, the expense of applying this source of power will be found prohibitive, except for very rare occasions, and we may consider it, therefore, beyond the pale of practical ventilation work.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—In consequence of the great demand on the resources of the Holborn Restaurant, the annual dinner of this Society has to be unavoidably postponed until May 27, 1891, at 6.30 for 7 p.m., in the above building (Queen's Salon).

SURVEYORSHIPS.

LLANDUDNO.—Mr. T. T. Marks, Assoc.M.Inst.C.E., who has been since 1876 Clerk and Engineer to the Llandudno Improvement Commissioners, has resigned those offices to enter upon private practice. A large number of the Commissioners and their townsmen on the 1st inst. entertained Mr. Marks at a farewell banquet, and presented him with an address, which recounted in flattering terms the works which Mr. Marks had carried out for the town during his fourteen or fifteen years' tenure of office. These include water-works, gas-works, sewerage, and town improvements. The address was accompanied by a purse containing the sum of 130*l.*, and by other presents. From the reports of the speeches made on the occasion, and from the enumeration of his works, Mr. Marks appears to have done a great deal for Llandudno, and to have well merited the thanks of its townsmen.

SOUTH SHIELDS.—The Town Improvement and Sanitary Committee of the South Shields Town Council have recommended the Council to increase the salary of the Borough Surveyor (Mr. Matthew Hall) from £400 to £450 per annum.

GENERAL BUILDING NEWS.

LIVERPOOL GENERAL POST OFFICE.—It is believed that Parliament will shortly vote the necessary funds for the site of a new General Post Office, which the increase of business in Liverpool has made necessary. A site in Victoria-street, about equidistant from the three principal railway stations, is spoken of as the probable one. The Liverpool Post Office has been for many years housed in a portion of the Custom-house buildings, which is now said to be quite inadequate for its double duty.

SCHOOLS, DONCASTER.—A new school-room in connexion with the Marsh-gate Mission Church, Doncaster, has just been completed. The new school is in Cheswold-street, and is connected by a passage with the playground at the back of the church. The site of the new school and the playground have both been given by Alderman Elwis. The contract for the school-room was let to Mr. W. Johnson for 657*l.*, and the plans were supplied by Mr. Herbert Athron. The building is 55 ft. long and 18 ft. wide, and has accommodation on one floor for 123 children. The Domestic Gothic style of architecture has been adopted, the facing being of pressed brickwork with stone dressing, and the roof being covered with green Westmoreland slates. The internal wood-work is of pitch-pine, with wood block flooring on asphalt concrete.

NEW WESLEYAN CHURCH, NORTH SHIELDS.—On the 26th ult., a new Wesleyan Methodist Memorial Church was opened for divine service at North Shields. The church has been erected in memory of a daughter of the late Mr. J. Robinson, of North Shields. The plan is cruciform, and consists of a nave and aisles, a transept on each side, and an orchestra separated from the body of the church by a stone arch; the extreme length inside is 93 ft., and the width across transepts 43 ft. It has galleries carried round three sides. The central part or nave is separated from the aisles by arcades of timber arches, carried on metal columns, which are of two tiers; the lower ones carry the rolled-iron girders supporting the gallery joists, and the upper ones the rolled girders on which the roof is placed. The ornamentation of the caps of columns is all of iron. The construction has been carried out in iron and wood, and all wood spandrils of arches are pierced with tracery work. To prevent any lateral thrust from the roof, wrought-iron tie-rods and king-rods are used, and relieved with moulded ironwork. The main entrance is by two moulded arched doorways in the south gable; inside these is an outer lobby, a door on either side communicating with inner lobbies, from which the interior of the ground-floor is reached—while from these inner lobbies access is obtained to the east and west staircases to the galleries. All these doors open outwards. The gallery staircases have separate exits by doors on their east and west sides. All the lobbies are laid with Minton's tesselated tiles, and the screens and door panels are filled with ornamental leadglazing. At the north end of the building, under the orchestra, is the minister's vestry, and on the east side of this are two vestries, one over the other, with the heating-chamber in the basement. Attached to these are lavatories and retiring-rooms. Separate access to the orchestra is obtained by a staircase on each side. In a yard in the rear are outbuildings. The whole of the seats and the gallery-front are of Canadian oak, with Orham (a Canadian ash) panels. A pulpit has been dispensed with, and a platform substituted, with a central desk for the officiating minister. The tower, which contains the west gallery staircases, is 73 ft. high, with a stone spirelet. Four of Honeyman's ventilators have been inserted in the roof of the building. The main south gable is pierced for four lancet lights, divided by red sandstone shafts with carved foliage caps, with three orders of moulded arches. The work has been carried out by Messrs. J. & W. Simpson, of North Shields. The heating apparatus has been supplied by Messrs. Dinning & Cooke, of Newcastle. Memorial windows, erected by the Messrs. Robinson to commemorate their late father and mother, have been placed in the six ground-floor windows of the west transept, forming two groups of three windows. Each window has a canopy in colours, with central panels containing the subjects. The windows have come from the studio of Mr. R. J. Newberry, of London. Mr. F. R. N. Haswell, F.R.I.B.A., has designed and carried out the work at the church.

BAPTIST CHAPEL, RODLEY.—On the 2nd inst. six memorial-stones were laid of a new Baptist chapel at Rodley, Yorkshire. The building is in the Classic style of architecture, freely treated, and is being built on a site fronting the Shipley and Bramley main road. The architect is Mr. J. P. Kay, of Leeds. The building will cost about 1,700*l.*, and will accommodate 300 persons.

WESLEYAN MISSION-ROOM, HUNSLET.—On the 2nd inst. memorial-stones of a new Wesleyan Mission-room, with class-rooms and caretaker's house adjoining, were laid at Hunslet, Yorkshire. The buildings are being erected from the designs of Mr. George F. Danby, architect, Leeds, upon a site situated in Church-street and Milner-grove, Hunslet. There will be a mission-room (entered by a lobby from Church-street) 31 ft. wide and 54 ft. long, which will accommodate 300 adults. Class-rooms of various sizes will be arranged on either side, giving further accommodation for 115, exclusive of another room 21 ft. by 16 ft. The main room will be lighted by three windows at each end and dormer windows in the roof. The buildings will be built of brick, with Harehills stone dressings, and the roof will be covered with Bangor slates. The internal woodwork will be of pitch-pine, varnished. Some of the windows will be glazed with tinted leaded lights, and the class-room windows will be glazed with rough plate-glass. The room will be ventilated by means of gratings in the ceilings, connected with Stevens's exhaust ventilators. The cost of the buildings, exclusive of warming and furnishing, will be about 1,325*l.* The contractors are Messrs. Hutchinson, Joseph James, J. W. Richmond, James Cockerill, jun., William Pennington, and Alfred Welham.

BATHS, BURSLEM. On the 6th inst. the Town Council of the Borough of Burslem instructed their surveyor, Mr. F. Bettany, to prepare plans for public baths on a site which has been presented to the town by Messrs. Woods.

LYCH-GATE, EMBERTON, BUCKS.—A lych-gate has been erected at the north-east entrance to the churchyard. It is of English oak, richly moulded, and resting on walls of Weldon stone, with Ketton stone dressings, and internal seats of York stone. The roof is covered with selected old tiles, and surmounted with a cross of iron and copper. The woodwork has been done by Mr. Wilford, of Newport Pagnell; the stonework by Mr. Mansfield, and the smith's work by Mr. E. Downing (both of Stony Stratford), from the designs and under the supervision of Mr. E. Swinfen Harris, architect.

NEW BATHS, SALTBURN.—On the 11th inst. Mr. Arthur Pease opened some new brine baths at Saltburn-by-the-Sea, Yorkshire. The building in which the baths are contained has a frontage, facing the railway station, of 80 ft., a depth of 130 ft., and covers an area of 1,155 square yards. In the centre of the building is the swimming-bath, surrounded by the various medicinal and curative baths and other offices. There are two principal entrances, one for ladies and the other for gentlemen, with offices between. Opposite the entrance is the swimming-bath, which comprises an enclosure 83 ft. long by 43 ft. wide, the bath itself being 75 ft. long by 30 ft. wide, and having a depth varying from 3 ft. at one end to 7 ft. at the other. This will be supplied with sea water pumped directly from the sea by means of special pumping-engines fixed near the sea level, the water being kept at a tepid temperature by steam-pipes carried along the bottom of the bath. Along one side of the bath are the dressing-rooms, twenty-one in number, with a balcony above for spectators, the building being covered by a glazed roof with pitch pine principals. Around the building there passes a corridor which gives access to the various sulphur and other baths, there being a complete and distinct set on each side of the building. Passing along the corridor to the right, which is the gentlemen's side, the first apartment is a waiting-room, adjoining which are attendants' rooms, massage-rooms, fresh-water bath-rooms, and the brine bath-rooms, with separate dressing apartments. At the back of the building are situate the douche-rooms. The arrangements on the other side of the building,—set apart for ladies,—are exactly similar. At the back of the building is situate the engine and boiler-house, with Cornish boiler for supplying steam for heating purposes. The building is of red pressed brick with terra-cotta ornaments, the interior woodwork being of pitch pine. The tower adjoining the principal entrance is fitted with tanks for storing the sea-water and brine, the latter being conveyed by rail in specially-constructed tank waggons from the brine wells at Middlesbrough. The builders' and joiners' work has been carried out by Messrs. W. & R. Blackett, of Bishop Auckland, and the engineering work and the construction of the baths by Messrs. T. Bradford & Co., Manchester. Mr. A. F. Griffiths, was the architect, assisted by Mr. Duncan, of Middlesbrough. The total cost of the establishment, including the site, has been 5,000*l.*

RESTORATION OF ST. GERMOE CHURCH.—St. Germoe Church, near Marazion, Cornwall, has just been reopened after restoration. The church had fallen into almost a ruin, and it was found necessary to rebuild nearly the whole of it. The walls have been rebuilt on the old lines, and the stones as far as possible have been replaced in their original positions. The whole church has been re-roofed with old English oak, a low carved oak screen separates the nave from the chancel, and an oak screen separates the south transept (which will be used as a vestry) from the nave. The floor has been paved with Bridgwater tiles, and the choir stalls are of carved oak. The Rev. Ernest Geldart was the architect, and Mr. James Julian, of Truro, was the contractor. The cost has been nearly 2,000*l.*

NEW R.C. CHURCH, HULL.—On Tuesday last, the new R.C. Church of St. Mary's, in Wilton-street, Hull, was opened. The church is Early English in style, freely treated; and consists of a nave 65 ft. in length by 22 ft. wide, with north and south aisles 10 ft. wide, and at the end of each is a side chapel. Each chapel has a rose window, filled with stained glass, carved stone altars with polished Irish marble columns, and a tiled reredos, and the floors are of encaustic tiles, with polished red marble steps. The sanctuary has a circular apse, and is divided from the nave by an arch resting on clusters of polished red marble shafts, with carved capitals of Early English pattern, and moulded bands and bases. The arches which separate the sanctuary from the side chapel are filled in with traceried oak screens. The nave is divided on either side from the aisles by an arcade of four bays, with moulded arches and labels on stone columns, the shafts of which are composed of blue Normanton stone. In the spandrils of the arches are circular panels, with angels in attitudes of devotion, and above the arcade is the clearstory, which is lighted by lancet-shaped windows. The roof timbers are of pitch-pine, and are divided into bays by moulded principals raised on carved stone rafters. Inside, the rafters are boarded with Soderbamn boards, and divided into panels by moulded ribs. The floor is laid with Mr. Roger Lowe's patent wood-block pavement in herring-bone pattern. The sanctuary is laid in encaustic tiles, the predella being of polished red marble. The altar-rails are of Ancaster stone, with a polished alabaster coping, and the gates of wrought-iron and polished brass. The pulpit and the font have been erected in carved Ancaster stone, with Irish green marble columns. The two stone doorways at the west end are under a deeply-recessed moulded brick arch, in the centre of which is a representation of Our Lord crowned with thorns, and on either side spandrils of carved Early English foliage. Over this arch is a crocketted gable, in the apex of which is a carved niche with the Madonna and Child. Above this rises a recessed triple window with stone columns and carved corbels. The church is seated with open pitch-pine benches, with kneeling boards attached. The choir stalls are of oak enriched with carved figures. There are two confessionals made of yellow pine, with pitch-pine panels, and a large working sacristy, with a glass conservatory corridor leading from the presbytery. The six sanctuary windows are filled with stained glass by Mr. Alfred Hemming, of London, and the west window with Grisaille glass. The rest are glazed with cathedral tinted glass in quarries. The church, which is heated by hot water on the high pressure system, will accommodate 500 adults. The contractors are Messrs. Colley & Levitt, bricklayers; Mr. Councillor Scott, joiner; Mr. Peers, Mason; and Mr. Beal, plumber and glazier. Mr. Seal, of London, executed the stone carving, and Mr. Frith, of Hull, the pulpit, the font, and the side altars. Messrs. King & Co. had the fitting of the hot-water apparatus. The architects were Messrs. Smith & Brodrick, and Mr. Arthur Lowther.

NEW R.C. CHURCH, LEEDS.—On the 30th ult., the new church of St. Patrick, Quarry-hill, Leeds, was formally opened. The church stands on ground acquired at a cost of 3,000*l.*, at the top of Quarry-hill, near to Marsh-lane. The cost of the building, which has been constructed from plans prepared by Messrs. Kelly & Birchall, of Leeds, is about 7,000*l.* The style of the building is Decorated Gothic, and the material is brick with stone dressings. The church consists of a nave, 31 ft. wide by 118 ft. long, and has double aisles on both north and south sides, with two ranges of arcades, giving a clear width of 72 ft. The principal aisles are arranged with chapels and confessionals alternately. The sanctuary at the west end is of the same width as the nave, and has an apsidal end. At the north side of the sanctuary is the Lady Chapel, with screened arches; and on the south side is the organ chapel and clerestories for chapel and choir. The nave is divided into five spaces, each having a double, three-lighted clerestory window, with geometrical traceried stone heads. On both north and south sides there are two high, three-light traceried windows. The roofs are of dressed timber, with moulded cornices. The walls are of pressed brick, with moulded cornices, the surface being relieved

with brick panelling. The arches of the nave are supported by stone pillars, with moulded caps and bases. The floors are of wood-block paving, and the seats of pitch pine. The principal contractors have been Messrs. Barber, Leeds, for the stone-work; Messrs. Taylor, Yeadon, for the joinery; and Mr. Calloway, Bradford, for the plastering.

NEW SCHOOLS, DARNALL, SHEFFIELD.—On the 9th inst. the foundation-stone of the new Church schools at Darnall, Sheffield, was laid by Mrs. E. W. Stanyforth. The new schools will be in a two-story building of stone, in the Gothic style, with the various rooms arranged for Sunday school purposes, as well as for parish meetings, &c. Accommodation for day schools is provided for 240 boys, 240 girls, and 212 infants. Block flooring will be provided, and movable partitions will be placed between the school-room and the class-room. The ventilation has, it is said, had special attention. Messrs. George Longden & Son are the contractors, their contract being 3,902*l.*, and the architect is Mr. C. J. Innocent, of Sheffield.

WORKS AT MANCHESTER CATHEDRAL.—We are informed on authority that the cost of the temporary repairs only to the roof of the choir of the Cathedral is estimated at over 300*l.* This is simply to clear the building from the risk and danger which, in the judgment of Mr. Crowther, the architect, was imminent. The immediate outlay has received the sanction of the Bishop, but it will very shortly be necessary to take into consideration further expenditure for the complete repair of this portion of the fabric. These repairs will be carried out strictly on the lines of the present construction, and Mr. Crowther has furnished the Chapter with a report both on the construction and condition of the choir roof, which has been for a considerable time in a somewhat critical state.—*Manchester Courier.*

MASONIC HALL, KINGSBRIDGE, DEVON.—The dedication of a new masonic hall, situate in Duncombe-street, Kingsbridge, Devonshire, took place recently. The inside measurement of the hall is 30 ft. by 20 ft. The angles are ornamented with Tuscan columns, carrying heavily-moulded cornices, from which spring curved and moulded ribs dividing the ceiling into sixteen panels. It is fitted with a Doric Bath stone chimney-piece and with pitch pine seating. Mr. George Hooper was the builder, and Mr. E. Watson was the architect.

NEW R. C. CHURCH, CARLISLE.—The plans of Messrs. Dunn, Hansom, & Dunn, of Newcastle-upon-Tyne, for the erection of a new Roman Catholic Church on the Warwick-road, Carlisle, have just been passed by the Carlisle Health Committee. The plans show that the building will be set back from the road to the extent of about 30 ft. It will cover an area of about 900 square ft., and consist of a nave, two aisles, two chapels, two sacristies, entrance porch, tower, and baptistry. The tower is at the west end, and is surmounted by a flag turret. The east window is of rose design with an entablature and four statues of saints below. The building will be of red stone, and the windows of plated glass. The roof will be slated; and in the interior of the church on each side of the nave there will be Gothic arches with columns, and the whole building will be in the Gothic style.

SANITARY AND ENGINEERING NEWS.

THE LONDON WATER SUPPLY BILLS.—The Hybrid Committee of the House of Commons upon the various London Water Supply Bills of this session, having taken further evidence in support of the Water Trust scheme promoted by the Vestries, have interrupted their execution of that Bill in order to take up that introduced by the Southwark and Vauxhall Waterworks Co. Before doing this, however, they took evidence from Mr. Grover, C.E., engineer of the Rickmansworth and Leatherhead Waterworks. This witness explained that the present supply of water for London was derived by the eight companies partly from springs and partly from flowing rivers, the springs being chiefly those of Kent, and the rivers being the Thames and the Lea. The population actually supplied was 5,581,491, and the number of houses was 752,555. The supply amounted on an average to 167,000,000 gallons a day, but on some occasions it had risen to 196,000,000 gallons a day. The Thames contributed 85,000,000 gallons, the Lea 58½ millions, and springs and wells 23¾ millions. From the Kent springs he thought some further supply could be obtained, but not much more from the Kent wells, which varied in depth down to 300 ft., and from which 17,000,000 gallons a day were being drawn. With regard to the Lea nothing more could be taken from the running river, but he understood that wells were being sought in the Lea Valley, and with some success. The maximum draft of the Thames to all the companies was 100,000,000 gallons, and, in his opinion, they ought not to be allowed to draw more than that quantity. Very little more water could be obtained from the present sources for London, and it had been manifest for the last ten years that additional sources were urgently needed. At Leatherhead the supply from the chalk was far greater than was required, and he believed that, by sinking in the valley between Leatherhead and Dorking, very nearly 10,000,000 gallons a day might be safely relied on with the present pumping-stations and two or three additional ones. And at Rickmansworth he believed they might safely depend on getting 20,000,000 gallons a day, not at the stations only, but from various points along the valley. The Leatherhead and Rickmansworth undertakings being adjacent to London, and an additional supply being necessary, they were the natural sources, and the only sources at present. Mr. Grover also stated that, at the present rate of increase, the population of London in 1891 would probably be found to amount to nearly 7,000,000, and that would require 45,000,000 gallons of water per day than was at present provided.

ALMONDSBURY WATER-WORKS.—The water-works at Almondsbury, Gloucestershire, which have been in course of erection for some time past, have just been opened. The water is supplied by means of a windmill, situated about a quarter of a mile from Almondsbury, at the base of which is a well 24 feet deep. The water is forced from this well by a Simplex wind engine, and also a double-action pump, through a main-pipe 3 in. in diameter, leading to a reservoir, situated at the brow of the hill. From this reservoir, which will hold 4,000 gallons, two supply-pipes are fixed, one leading down the hill by the post-office, and the other extending along the brow of the hill. At the end of these supply-pipes will be a fountain by Beck & Co., of London, at which the parishioners will obtain the water. The work has been carried out by Mr. John Wallis Titts, of Warminster.

NEW RESERVOIR, BURY, LANCASHIRE.—On the 7th inst. Mr. Alderman Peers, of Bury, cut the first sod of a new reservoir to be constructed by the Bury Corporation at Clough Bottom, near Newchurch-in-Rossendale. The gathering-ground is 736 acres, the surface of the reservoir 32 acres, the maximum depth 76 ft., with a capacity for two hundred thousand million gallons.

DRAINAGE AND SEWAGE WORKS, DODWORTH, YORKSHIRE.—On the 8th inst. Colonel W. M. Ducat, R.E., an Inspector of the Local Government Board, held an inquiry at Dodworth into an application of the Dodworth Local Board to borrow 5,000*l.* for works of drainage and sewage disposal. Mr. Gibson, the clerk, explained that the district had not hitherto had any proper system of drainage, but the sewage from the houses in the district had been conducted into the dyke which runs along the north side of the village and through Dodworth Bottom. The inefficiency of the present method had long been realised, and the Board had been anxious to remedy the defects and prevent the pollution of the dyke at the earliest possible moment. Inspectors of the Local Government Board had also called attention to the matter, and the Board had refused to sanction any scheme of sewerage which did not provide for the purification of the sewage before any portion of it was allowed to enter the stream.—Mr. John Wade, surveyor, Barnsley, explained the system which the Board on his recommendation had adopted. The town would be properly drained, the surface water being taken out of the sewers, and the sewage would be treated on seven acres of land which the Board had acquired.—After hearing the evidence, Colonel Ducat visited the site of the proposed works.

SEWAGE WORKS, RAINHILL, LANCASHIRE.—On the 30th ult., at the Rainhill National Schools, Major Phipps Carey, R.E., held an inquiry on behalf of the Local Government Board with respect to an application by the Prescot Union Rural Sanitary Authority for power to borrow 1,500*l.* for works of sewerage in Rainhill. Mr. S. H. Hartley conducted the Sanitary Authority's case, and said the proposed scheme was the completion of that of 1875, which, if adopted, would complete the sewerage of the township. Mr. Oppenheim said the Widnes Local Board did not oppose the scheme, but the sewage farm was a great cause of complaint.

FOREIGN AND COLONIAL.

FRANCE. There is some talk of demolishing, to replace it by a business building, the celebrated Pompeian house in the Avenue Montaigne, built under the Second Empire by M. Normand, and which belonged to Prince Napoléon.——There is also talk of a competition for the building of a new Salle des Séances for the Chamber of Deputies, and of additional salons at the Palais Bourbon. The total expenditure proposed is 2,000,000 francs, with a first premium of 12,000 and a second of 4,000 francs.—The design prepared by M. Guillotin for the rebuilding of the Opéra Comique has just been laid before the Minister of Public Works, who, after taking the opinion on it of the "Comité des Bâtiments Civils," will submit it shortly to the Chambers.——The Champs de Mars Salon was announced to open on the 15th (yesterday).——M. Claude Monnet, the painter, has organised at the Durand Ruel Gallery an interesting collection of his works, which will be open till the 20th of this month.——The widow of a rich collector has left to the museum of the Society of Antiquaries of Normandy a triptych in Limoges enamel of great value, dating from the sixteenth century. The centre panel represents the Adoration of the Shepherds, the two others the Annunciation and the Salutation of the Angel.——The Bishops of Rodez, St. Flour, and Viviers have taken the initiative for the erection of a colossal statue of the Virgin on the hill of Fontaneilles, situated on the confines of Rouergue and Gévaudan.——The Minister of Public Works opened last week the railway from Champagnole to Lons-le-Saulnier.——At Avignon the centenary celebration of the annexation of the county of Vénaissin to France has been commenced, and the fêtes will last to the end of May, when there will be inaugurated, on the Place de la République, the commemorative monument intended to replace the statue of Crillon which has been moved to the Place de Château des Papes.——M. S. H. Berthoud, a man of letters recently deceased, has left a splendid collection of works of art to Douai, his native town.——A subscription has been set on foot among the revolutionary clubs in Paris for the purpose of erecting a monument to the victims of the recent collision with the authorities at Fourmies.——There have been discovered at Avallon (Yonne), on the Côte-des-Chaux hill, the remains of a Roman house which is supposed to have been an advanced post of a Roman camp. A number of objects were found, such as pieces of amphoræ, cups, arrow-heads, &c.——On the occasion of the anniversary of the 1889 Exhibition, M. Dutert, the architect of the Palais des Machines, has been fêted at his native town of Douai. He was received at the railway-station by the representatives of the Municipality, and conducted to the Hôtel de Ville, where he was offered a "vin d'honneur" as well as the gold insignia of the Legion of Honour. This kind of honour to an architect deserves notice as being a somewhat rare incident.——The death is announced of M. Joseph Antoine Gardet, a sculptor of much talent, who obtained a second medal in 1888 for a bas-relief entitled "Le Drapeau," which was purchased by the Municipality of Paris. The present Salon has his latest work, a group in marble representing "Le Sommeil de l'Enfant Jésus."——The ex-Empress Eugénie has built a château on the promontory of the Cap Martin, near Mentone.——M. Larroumet, the Directeur des Beaux-Arts, has been classed in the first line among the candidates who present themselves for the place left vacant at the Académie des Beaux-Arts by the death of Prince Napoléon. M. Lafenestre is in the second line. The election takes place to-day (Saturday).

HAMBURG.—The new block of Municipal Buildings, the so-called new "Rathhaus," now in course of erection, is progressing gradually, and it is hoped that the roof will be on next year. 6,750,000 marks have been voted to cover the costs of the building, 700,000 marks are to be voted for the sculpture on the façades, so that, when complete with internal fittings and furniture, the total is likely to reach 1,000,000 marks, or nearly £50,000. We hear that no fewer than twenty emperors and six nobles are to be commemorated by statues in the façade, besides some twenty-four allegorical figures.

KONIGSBERG.—The University here, thanks to unbounded liberality of an old student, now resident at New York, will be the first German University to have some institution in connexion with it, in which bodily exercise and mental recreation can be had. An extensive block of buildings, including a club-house on a grand scale, a riding-school, swimming-baths, a gymnasium, and a school of arms, is to be erected here. The preliminary competition for designs has already taken place.

RUSSIA.—The French Arts and Crafts Exhibition at Moscow, the idea of which was so very popular on account of political reasons, seems to have been a false step from the mercantile point of view, at least for Russia, as the Moscow merchants seem to have already found out, to their cost, that they will in future have an exceedingly stiff French competition to deal with, and are bitterly complaining.——Referring to the proposed railway across Siberia, a technical paper informs us that the two schemes (see December 27, 1890) advocated are being worked out, but that up to the present it is not settled which of the two will be taken in hand. The cost of the direct route from Tjumek, in the Urals, to Vladivostock, on the Pacific coast, 8,000 versts long, is estimated at 340 millions of roubles. The cost of the indirect route, from Tomsk to Vladivostock, in which a combination of short railways with the great waterways of the country is recommended, which line could, however, only be open one-third of the year owing to the rivers Obi and Irtysk being frozen over, is estimated at 120 million roubles. Whichever route be taken, a railroad to the Pacific coast will be of great strategic and also commercial importance to Russia.——From an official report just issued by the Russian Minister of Communications, we learn that the working of the Russian railway last year was satisfactory. The length of the private lines was 19,231 versts, and that of the state lines 8,007 versts, making a total of 27,238 versts (3 versts=2 miles).

There has been a steady increase of both passengers and goods traffic during the last quinquennial period. The earnings of the private railways decreased last year by 2 per cent., but those of the State increased by nearly 4 per cent. On the new great line into Central Asia the receipts even increased by 22 per cent. in the period 1885-1890.

NORWAY. — The buildings designed by Herr Munthe for the German Emperor, in Norse style, to be erected in Silesia and at Potsdam, and to which we have previously referred, will be executed and put together by Herr E. Olsen, builder, of Frederickstad, and then taken to pieces for subsequent re-erection at the places of destination. —— The committee charged with considering the designs for a new theatre in Christiania has accepted those of Herr Henrik Bull, a well-known architect, and they have now been on view to the public. The cost of the building is estimated at about 40 000*l.*, and the interior fittings, with warming and electric-light installations, at 20,000*l.*——The Eastern Railway Station, in Christiania, is to be greatly enlarged, but this year only some 2,500*l.* are to be expended on the work.——It is proposed to pull down the old Palace, a former Royal residence in the capital, and use the site for the erection of some public building, possibly a new custom-house.——The municipality of Christiania has adopted plans for the erection of a large central electric lighting station, the site to cost 5,000*l.*, and the building and works 23,000*l.*——A series of stringent regulations respecting scaffoldings, &c., in the capital, have been issued by the authorities.——A new central post-office is to be built in the town of Bergen, at a cost of 12,000*l.*, the designs accepted being those of Herr Dybwad.——An important work to Norwegian architects and builders will shortly be issued, viz., "Handbook of Architecture," by Edvard Kolderup, engineer, and two prominent architects,—Herrer Trap-Meyer & Ebbell. There does not exist a single work in Norwegian on architecture and building, those used by architects being principally German.——The Storthing has a scheme under consideration for the improvement and protection of the important port of Bodö, on the north-west coast, at a cost of 34,000*l.*

MISCELLANEOUS.

THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—A Midland Counties District meeting of this Association is to be held at Stourbridge on Saturday next, the 23rd inst., when the following papers will be read:—(1) "On the Sewage Disposal Works of the Stourbridge Main Drainage Board," by Mr. W. Fiddian, F.S.I.; (2) "On the Market Harborough, Great and Little Bowden Waterworks," by Mr. H. G. Coales, Assoc. M. Inst. C.E. Afterwards, the party will leave in brakes for a visit to the glass-works of Messrs. Thomas Webb & Sons. They will then visit the sewage pumping-station and the sewage-farm at Whittington, subsequently returning to the Town-hall for the discussion of the papers.

LECTURES AND DEMONSTRATIONS FOR SANITARY OFFICERS AND OTHERS.—We are informed that the County Council of Staffordshire, having observed the great advantage arising from the periodical courses of instruction given by the Sanitary Institute to sanitary officers, have asked the Council of that Institute to co-operate with them in organising similar lectures in the county of Stafford. Accordingly a list of lectures has been arranged for the special instruction of those desirous of obtaining knowledge of the duties of sanitary officers. The County Council very laudably undertake to pay the travelling expenses of all Inspectors holding office in the administrative county of Stafford who enter for the examination to be held in Stafford by the Sanitary Institute at the end of the course. The first of the twelve lectures arranged for was to be given on Wednesday last in the Shire Hall, Stafford, by Sir Douglas Galton. Among the lecturers is Mr. P. Gordon Smith, the Architect to the Local Government Board, who will lecture on "Sanitary Building Construction" on the 27th inst.

THE FINNISH IRON AND STEEL INDUSTRY.—From the annual report, just issued, of the Finnish iron and steel industry, we learn that the ores used in the same are derived wholly from lakes and bogs, *i.e.*, so-called "lake" and "bog" ore, having but small contents of iron. Of these kinds of ore 15,000 tons were raised. There is only one small iron mine being worked, the balance of ore required being imported from Russia. We further learn there were fifteen furnaces in blast in Finland, producing 1,500 tons of pig-iron, valued at 65,000*l.*; whilst the manufacture of bar iron amounted to 3,400 tons, valued at 30,000*l.*; and that of plates, rods, angles, and mill bars to 6,700 tons, valued at 63,500*l.* The make of steel in ingots was 1,350 tons, valued at 15,200*l.*; of iron and steel goods, 2,500 tons, valued at 36,500*l.*; of cast-iron and steel ware, 4,200 tons, valued at 38,000*l.* Owing to the non-working of the largest Finnish iron and steel works, which in the preceding year produced some 3,500 tons, there is a falling-off in the output of iron and steel in Finland amounting to 2,600 tons. The number of men and women employed in these industries is 17,534. The value of the fuel used in the manufacture is estimated at 24,000*l.*, whilst the entire metallurgical production of Finland is valued at 645,000*l.*, being an increase upon the preceding year of about 50,000*l.*, or 9½ per cent. Naturally, most of the Finnish iron and steel goes to Russia, but by a ukase passed some five years ago the imports are limited, whilst duties are imposed on certain kinds of iron which has entirely crippled this flourishing trade. Since this law came into force the total imports and limits have been as follows:—Pig-iron and blooms, 110,000 tons (limit 120,000 tons); bars, 103,700 tons (limit, 120,000 tons); manufactured iron and steel goods, 10,640 tons (limit 21,000 tons); machinery, tools, &c., 1,500 tons (limit, 18,000 tons).

THE RUSSIAN METAL INDUSTRIES.—From an official report just published on the Russian metal industries in 1888, we learn that iron ore was raised from 612 mines and 149 lakes to the amount of 1,380,000 tons, as against 1,305,000 tons in 1887. Pig-iron was produced at 132 foundries, the output being 610,000 tons, of which 400,000 tons were produced in the Ural. The increase of make since 1887 is 52,000 tons, or about 9 per cent. In the decennial period 1879-88 the manufacture of pig-iron has increased 54 per cent., or 230,000 tons. Bar-iron was manufactured in 1888 at 173 works, the make being 350,000 tons, as against 345,000 tons in 1887. In the period 1879-88 the make of bar-iron has increased by 80,000 tons. The number of steel works in Russia in 1888 was thirty-two, which turned out 210,000 tons, as against 205,000 tons in 1887. Of late years Russia has gradually been increasing her duties on iron and steel, with such success, according to this report, that at present hardly 10 per cent. of the country's requirements are taken from abroad.

MOSAIC PAVING.—Mr. Batsford announces the publication shortly of a collection of rubbings of floors at Pompeii and Venice, with additional patterns from Rome and Palermo, by Mr. Arthur T. Bolton, A.R.I.B.A. The work will consist of thirteen plates, including the title-page and two of full-sized details; the remaining ten plates being reduced to half full-size, from tracings of the original rubbings made in Italy, of the best examples of old mosaic pavements.

INDIAN PHOTOGRAPHS. — We have received Volume I. of a collection of small but very good photographs of buildings of interest in India, reproduced by the Autotype company from photographs by Lala Deen Dayal, with descriptive notes by Lieut.-Col. Cole, R.E. The first book comprises buildings in Delhi and Agra. It is a little book, but the series when carried out will make an interesting collection of Indian illustrations.

LIVERPOOL ENGINEERING SOCIETY.—The annual general meeting of this Society was held at the Royal Institution, Colquitt-street, Liverpool, on the 6th inst. Mr. Ferdinand Hudleston, Assoc.-M. Inst. C.E., President, took the chair, in the presence of a large number of the members. The following officers and members of the Council were elected for the forthcoming session, viz.:—President: Mr. John T. Wood. Vice-Presidents: Mr. H. P. Boulnois, M. Inst. C.E., and Mr. R. E. Johnston, M. Inst. C.E. Council: Messrs. Blair, Cottrell, Farren, Miller, Mills, Morgan, Potts, and Sang. Hon. Secretary: Mr. J. H. T. Turner. Hon. Treasurer: Mr. O. S. Pilkington. Hon. Librarian: Mr. J. A. Brodie. The remainder of the evening was taken up by the adjourned discussion upon a paper read by Mr. George Farren, Assoc. Inst. C.E., at the previous meeting, entitled "Denudations at Aber-Menai, Anglesey."

ROLLERS FOR GRANOLITHIC PAVEMENTS.—Mr. Alexander Gilchrist, brassfounder, Glasgow, sends us some particulars of his brass rollers and mountings for granolithic pavements. These pavements are composed of chips of granite and cement, are laid out in a semi-liquid state, in which condition they are indented by means of these brass rollers, in order to present a good foothold. Mr. Gilchrist has invented a method of making the rollers and teeth all in one piece, which he claims is a distinct advantage over the old method, whereby the teeth were constantly dropping out and needing to be replaced. Rollers of other kinds, for making corrugations or grooves in stable or other floors, are also made by Mr. Gilchrist.

NEW BELLS FOR ST. SIDWELL'S, EXETER. — Messrs. Mears & Stainbank, of Whitechapel-road, London, have received instructions to cast two new bells to fill the vacant "cages" in St. Sidwell's Church-tower, to make the peal of ten complete. Mr. Harry Stokes, of Woodbury, will do the necessary hanging. The work is to be all complete by June 13. So long ago as 1773, Messrs. Mears & Stainbank recast the eight bells at present in the tower. The work of erection will be carried out under the direction of Mr. Ed. Ashworth, architect, Exeter.

ALTAR FRONTALS.—The Decorative Needlework Society, 17, Sloane-street, have just completed two altar frontals, which are on view for two or three days. We are asked to say that the Society has always much pleasure in showing work of this kind to those who are interested in it.

THE LATE MR. VERITY.—We are asked to state that Mr. Hunt was not at any time, as we supposed, in actual partnership with Mr. Verity. They were collaborators in various buildings and competitions, in connexion with which the names of the architects appeared as "Messrs. Verity & Hunt," but they were never in any permanent partnership.

FAWCETT'S FIREPROOF AND VENTILATING FLOOR. —We are informed that a syndicate is being formed for the purpose of developing the United States patent for this floor. The capital of the syndicate is to be 2,000*l.*, in 100 shares of 20*l.* each; no one member of the syndicate to hold more than five shares.

REMOVAL.—Messrs. Szerelmey & Co., manufacturers of the well-known stone-waterproofing liquids and iron paints which bear their name, have removed their counting-house to Faraday House, Charing-cross-road.

LEGAL.

ROAD-SCRAPINGS FOR "MORTAR."

AT the Second Court of the Sheffield Town Hall, on the 7th inst., before Mr. Frank Mappin and Alderman W. J. Clegg, Alfred Margerison was summoned with regard to four houses he is erecting in Vincent-road, the charge being that he did not use "good mortar compounded of good lime with clean sharp sand, or other suitable material; or with good cement; or good cement mixed with clean sharp sand."

Mr. H. Sayer, the Deputy Town Clerk, who appeared for the prosecution, explained that the charge was under the building by-laws of the Corporation, and this was the first case under the by-laws with regard to mortar, which must be of the quality mentioned in the summons. An inspector found that the defendant was using road-scrapings as mortar for the foundations, and some of the superstructure of the four houses he was building in Vincent-road, Sharrow-lane, and this, it was contended by the prosecution, was not suitable material.

Mr. Fairclough, District Building Inspector, said he visited Vincent-road on March 5, and saw that the defendant had four houses in course of erection. On a mortar board he found a small quantity of lime mortar, but on pulling down part of the foundation stones he discovered that nothing but road scrapings had been used. At one part of the foundation wall there was a quantity of horse manure. He took samples to dry for the purpose of analysing, but the smell arising from the material as it became warm was so bad that he was obliged to throw it away. He afterwards learned that some of the material had been taken from gulley grates.

Defendant admitted the offence. He said many other people used the same stuff, and were not prosecuted, whilst he, who had only had two or three loads was summoned.

Mr. Mappin said the Inspector had to throw the stuff away, it smelt so when being dried.

Defendant said he believed it would smell when warm.

Mr. Mappin said the magistrates considered the case to be a very bad one, but as it was the first prosecution under the by-law, a fine of 3*l.*, and costs 2s., would only be imposed.

Defendant, as he left the box, said "I shall build no more after this lot."—*Sheffield Evening Telegraph.*

CAPITAL AND LABOUR.

THREATENED GENERAL LOCK-OUT OF LONDON CARPENTERS AND JOINERS.—At a large and influential meeting of the builders of London, held at the Westminster Palace Hotel on Monday last, at which nearly all the leading firms were represented, it was resolved, with but one dissentient:—"That this meeting, representing the largest employers in the building trade of London, being of opinion that the demands made by the carpenters and joiners are unreasonable, authorises the Committee of the Central Association of Master Builders of London to give notice to the United Trades Committee of Carpenters and Joiners that unless the firms struck against are enabled to obtain sufficient men to meet their requirements by the 23rd day of May, 1891, the only course open will be to close all shops and works against carpenters and joiners, and this meeting pledges itself to do so."

THE BUILDING TRADE IN WELLINGBOROUGH.—The *Northampton Mercury* reports the results of a meeting of the representatives of the master builders and the bricklayers and joiners with reference to arranging for a code of working rules and an advance of wages. As to the former, the rules were gone through, and an agreement was practically come to; and as to the wage, the masters decided to recommend their Association to pay a maximum sum of 7d. per hour to those men who are considered worth that amount. The joiners' representatives agreed to this, and decided to recommend their Association to accept it, but the bricklayers did not come to a decision, their opinion being that the extra wage should be given all round.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
Public Baths	Shrewsbury Corp.	50*l.* and 20*l.*	June 1
*Buildings for the Manchester Whitworth Institute	The Council	100*l.* 75*l.* 50*l.* &c. ..	Sept. 29

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Gas-holder Tank	Finedon Gas Co.....	John Euson	May 19
Police Station, Gorton	Lancashire C. C.....	*Official*	do
New Streets, Diversion of Stream, &c. Ton Pentre, Neath	R. P. Morgan	.....	do.
Asphalting, &c. South End schools, Eiland	Eiland with Greetland School Bd	*Official*	May 20
Fittings for Purifiers, Gasworks.....	Rotherham Corp.	.....	do
Railway Sidings.....	Leeds Forge Co.....	*Official*	do.
House, Shop, and Outbuildings, West Ryton-on-Tyne	Jos. Todd	.....	do.
Poor Law Offices, Becket street	Derby Guardians	Ernest Ryley	do.
Alterations to South Wellington-street Police Station	Glasgow Police Com.	*Official*.....	do.
Rowley Ragstone (5 000 tons)	Aston Manor Loc. Bd.	W. Augustus Davies..	do.
Road-Making, Culvert, &c. Dyserbert and Treorchi, Cardiff	Marquess of Bute	.....	do.
*Painting, Woolwich.....	War Dept.	*Official*	do.
Three Shops, Lower Parliament-row, Hoyley, Staffs	J. H. Davis	G. W. Bradford	May 21
Extensions, Board School	Cardiff School Board..	Seward & Thomas	do.
*Cleansing, Whitewashing, Painting, &c. Infirmary	St. Pancras Parish.. .	*Official*	do.
*Painting and Cleansing Works, and Repairs, Caterham Asylum	Met. Asylums Board	do.	do.
Additions to Glove Factory, Court Ash Yeovil	.....	Edward Vining	May 22
Painting, Repairs, &c. at Infirmary	St. George-in-the-East Guardians	Wilson, Son, & Aldwinckle	do.
Premises, Seaham Harbour, Sunderland	Co-op. & Indus. Soc. Lim.	Wm. Milburn	May 23
Hotel, Pepygraig, Pontypridd	.....	A. D. Evans.....	do.
Dwelling-house, Shop, and Premises, Wyndham-street, Bridgend	Mrs. Ann Morgan	G. F. Lambert.....	do.
*Two Slate Tanks	Cambridgeshire Asy.	*Official*.....	do.
*Erection, Furnishing, and Heating of School	Swansea School Board	T. P. Martin.....	do.
Wesleyan Church, Tenworth-st. Lichfield		Thos. Guest	May 25
Grand Stand, Shedding, &c. Show yard, Leek, Staffs	Staffs. Agric. Soc.	*Official*	do.
*Painting &c. Works, N. W. Fever Hosp.	Met. Asylums Board..	do.	do.
*Construction of Filters, &c. Sewage Works	Nuneaton Local Board	J. S. Pickering	do.
New Premises, Wharton street, Cardiff ..	Septimus Fletcher....	E. M. Bruce Vaughan	do.
Work at Cemetery, Hebburn	Hedworth, Monkton, & Jarrow Burial Bd.	J. H. Morton	do.
*Brick and Pipe Sewers, &c &c.	St. Giles B. of W....	G. Wallace	do.
*Roofed York Paving Stone	Bermondsey Vestry ..	*Official*	do.
*Riding School, Stables, and Sheds.....	War Department	do.	May 26
*Wood Paving Materials	Vestry of Chelsea	F. W. E Higgens	do.
*Construction of Engine House, &c.	West Ham Council ..	Lewis Angell	do.
*Storage Reservoir, Auxiliary Pumping Station, &c.	Belfast Corporation ..	*Official*.....	do.
*Works and Materials	West Ham Council ..	do.	do.
*Roadmaking Works.....	Lewisham Bd. of Wks.	do.	do.
Eight Houses, Sowerby Bridge, Yorks....	.....	S. Wilkinson	do.
Day rooms, Dormitories, and Two Pairs Semi-detached Cottages	Hereford Asylum Com.	W. W. Robinson.....	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Painting, &c. Interior of Casual Wards, Hoxton	Shoreditch Guardians	F J Smith	May 27
*Joining Sewers Works, &c.	Greenwich Bd. of Wks	*Official*	do.
*Broken Granite, Flints, &c.	Hackney B. of W.....	J. Lovegrove	do.
*Scavenging and Watering Streets, &c	St. Saviour's B. of W	(*office*)	do.
Sewerage Works.....	Middlewich Loc B. ..	R. T. Worth.....	do.
Extension of Schools, Ely, Cardiff	Cardiff Union Guardians.....	Seward & Thomas	May 28
Central Stores, West Hartlepool	Co-op. Soc. Lim.....	Wm. Young	do.
*Sewerage Works.....	Stockton-on TeesCorp.	*Official*	do.
*Rebuilding Bridge.....	Essex County Council	do.	do.
*Bridge over River Ingleborne	do.	do.	May 29
*Iron Fence, Manhole Covers, Step Irons, Gratings, &c.....	Hornsey Local Board	T. de Courcy Meade ..	June 1
Offices, Stores, &c., St. Vincent's Ironworks, Bristol	John Lysaght (Lim.)..	R. M. Drake	do.
*Forming and Laying-out of a Public Park	Stockton-on-Tees Cpn.	K. F. Campbell	do.
Portland Cement, Macadam, & Chippings	Toxteth Park Loc. Bd	John Price.....	do.
Work at Goods Yard, Halton station	L. & N.W. & G. W. Joint Railways.....	*Official*.....	June 3
*Four Houses with Out-buildings at Purfleet	Admiralty.....	do.	do.
*Steam Water Heater	Edmonton Union	do.	do.
*Roadworks at Fulham.....	LondonCountyCouncil	do.	do.
*Erection of Stone Bridge over River Taff	Merthyr Tydfil Loc. Bd	do.	do.
Ironwork, Retort House	Preston Gas Co.	Henry Green	June 3
Alterations, &c., to Hospital, Brithdir....	Merthyr Tydfil Union Guardians	James Jones.....	June 4
*Sewerage Works	Atcham R.S.A.....	.....	June 6
Additions to Hospital	Chesterfield & N Derbyshire Hospital....	*Official*	June 3
*Superintendent's Lodge, Battersea-park..	London County Council	do.	June 9
Lighting Town Hall with Electricity	Manchester Corp	do.	June 17
*Police Stations	Carmarthenshire County Council	do.	June 29
Granite Road Metal (2,000 tons)	Audlem (Nantwich Highway Board	do.	July 1
*Guild Hall, Municipal Buildings	Borough of Oswestry..	Henry A. Cheers.....	No date
Roads, Footpaths, &c. Burton Latimer, North Hants.....	Building Society	Ed. Sharman	do.
Repairs to Mill, Foxley, Towcester	Geo. Osborn.....	.....	do.
Eight Houses, Shiremoor, Earsdon	W. Dobson	.....	do.
Seven Houses, Cannock Wood, Staffs	John M'Mic.....	.....	do.
Twelve Cottages, West Stanley, Durham	West Stanley Colliery Co.....	.....	do
Rebuilding Residence and Stables, Ashton, Devon.....	F. Treeby	E. H. Harbottle	do.
Row of Houses, Blenkinsopp, Greenhead, Carlisle	Thompson & Sons	G. Dale Oliver.....	do.
Additions to Wesleyan Schools, New Wortley, Leeds	.....	T. Butler Wilson.....	do.
Three houses. Commercial-road, Halifax	Richard Horsfield	.....	do.
Parish Church, Beckmondwike	.....	Peterson & Cowgill....	do.
Presbyterian Church and School, Belling-ton, Northumberland	.....	Mr. Macard	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Surveyor, Inspector of Nuisances, &c.	Ware Local Board	125*l.* &c.	May 19
*Building Inspector	Southend Local Board	.....	May 20
*Assistant City Engineer.....	Cape Town Corp	300*l.*	May 23
*Assistant (Borough Engineer's)	Stockton-on-TeesCorp.	150*l.*	May 23
*Sanitary Inspector	Hanover Square Vest.	200*l.*	June 1
*Inspector of Nuisance.....	Paddington Vestry ..	120*l.*	June 4

Those marked with an Asterisk (*) are advertised in this Number. *Competition, p.* iv. *Contracts, pp.* iv., vi. *and* viii. *Public Appointments, p.* xviii.

MEETINGS.

SATURDAY, MAY 16.

Glasgow Architectural Association. — Visit to Kilbirnie Church, &c.

MONDAY, MAY 18.

Royal Society of Antiquaries of Ireland. — General Meeting to be held at Kilkenny. 2 p.m.

WEDNESDAY, MAY 20.

British Archæological Association. — 1. Mr. G. Allis on "The Discovery of a Roman Colonnade at Lincoln." 2. Mr. A. G. Langdon on "The Padstow Crosses, Cornwall." 8 p.m.

Guild and School of Handicraft.—Mr. G. Thomson on "The Industrial Partnership of Woodhouse Mills." 8 p.m.

Royal Meteorological Society.—Three papers to be read. 7 p.m.

THURSDAY, MAY 21.

Society for the Encouragement of the Fine Arts.—Mr. R. Phené Spiers on "The Origin of Some Architectural Forms." 8 p.m.

Institution of Electrical Engineers.—8 p.m.

FRIDAY, MAY 22.

Architectural Association.—(1) Election of Officers. (2) Mr. Ernest Newton on "Homelike Houses." 7.30 p.m.

SATURDAY, MAY 23.

Architectural Association.—Visit to Mansions, Palace-court, South Kensington. Meet at 3 p.m.

Incorporated Association of Municipal and County Engineers. – Midland Counties District Meeting at Stourbridge.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

8,817.—HINGES: *K. Radler.*—The hinge which is the subject of this patent is made adjustable by means of a screw, and a method is adopted to prevent this adjusting-screw from working loose or changing its position.

19,102. — TARRING FIBROUS MATERIALS: *J. F. Anderson.*—For tarring all kinds of fibrous materials, some of which may be used for roofs, &c., it is claimed that an improved arrangement consists in passing the material to be tarred over an open conductor. The tar is applied in a continuous stream from above by means of a pipe or other conductor, the superfluous tar being passed through a perforated hollow in the conductor or squeezed out by being passed through a pair of rollers.

21,087. — DRAUGHT IN FIREPLACES: *J. Sepulchre.*—This invention consists in giving the draught two exits from the fire, into chimneys, one over the fire and one below the top of the fire, through the fuel; either of these dampers may be closed at will to divert the draught into the other. A plate constituting the back of the grate is raised to open the bottom exit to the chimney, or the lowering of the plate closes the lower exit and opens the top one; while holding the plate midway partially opens both exits.

2,884. — SCAFFOLD BRACKETS: *S. Van Vliet.* — The bracket which is the subject of this patent is so arranged that when in place the weight which is superimposed upon it will cause the bracket to adhere more firmly and tightly fasten itself to the bracket.

2,894.—IMPROVED PAVING: *C. Claussen.*—The paving which is the subject of this patent has a foundation of concrete with a covering layer of asphalte within which are embedded forged or wrought-iron ribs set on their edges and of the same height as the thickness of asphalte. The frames with the ribs are heated and placed in the asphalte paste before it hardens, and only the edge of the iron rib shows above the asphalte.

3,351.—PLASTER SLABS: *R. R. Coursen.*—The slabs referred to in this specification are made in moulds, and have a wire backing. The bottom of the mould is provided with upwardly-projecting wires or headless nails reaching to the level of the top of the mould, and numbered to correspond with the moulding and number of wires in the slabs. These form holes in the plaster slab which are convenient for fixing them.

3,724.—CONSTRUCTING STAIR-WAYS: *R. Hermans.*—Where one, two, or three steps are required in out-door work a rough-and-ready method of making them of iron supports filled in with earth is employed.

NEW APPLICATIONS FOR PATENTS.

April 27.—7,209, W. Eddleston, Fasteners for Windows.—7,229, G. Cooper, Self-acting Hooks for Holding Doors or Gates.—7,234, G. Rieunier, Grates.—7,250, W. Hoare, Circular Saws.

April 28.—7,279, W. Withington, Disinfecting Water-closets, &c.—7,347, C. Kimpien, Machines for Making Bricks, Tiles, &c.

April 29.—7,359, J. Merrill, Syphon-flushing Cisterns.—7,370, T. Hunt, Glazing Earthenware Pipes, Tiles, &c.—7,389, H. Hill, Barrel Bolts.—7,411, W. McKinnon, Chimney Cowl.—7,429, A. Simmons, Combination Tap Socket and Pipe Connexion or Sleeve for Pipe, to enable water or gas to be drawn from any desired part of a pipe without the usual joint; applicable also for closing the open parts of burst pipes.—7,431, J. Cole, Window Fastenings. — 7,432, E. Breething, Brick-moulding Machinery.

April 30.—7465, G. Inkpen, Ventilation of Shop Windows.—7,470, G. Alston, Stoves, Flues, and Fireplaces.—7,475, R. Jeffrey, Door Knockers.—7,486, J. De Long, Window Ventilators.—7,497, S. Allin, Check Springs for Doors.—7,507, A. Heming, Sash-fastener.—7,510, R. Marshall and E. Fitz Gerald, Air-propelling or ventilating.

May 1.—7,532, J. Bone and W. Wilton, Sash or Screw-up Sockets for Shop Window Fittings, Arms, Racks, or Branches.—7,534, J. Williams, Glazing.—7,563, F. Marwood, Window-fasteners.—7,567, W. Martin and others, Convertible Window-sashes.—7,576, W. Alexander, Sash-fasteners.

May 2.—7,609, J. Reynolds, Butt Hinges, &c.—7,616, T. Bury, Vertical Sanitary Pipe-pressing Machines for Bricks, Wall Coping, Floor Tiles, &c.—7,631, A. Adams and J. Haldam, Sash Fastenings.—7,638, T. & W. Pile, Machines for Moulding and Pressing Clay, &c.—7,649, F. Gibbons, Locks of Window Sashes.—7650, H. Downing, Sash-fasteners.—7,652, H. Earl and W. Briggs, Sanitary Pipes, &c.—7,659, G. Emerton, Glazing Roofs, Skylights, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

4,383, R. Warren, Fastening Attachment for Gates.—4,743, N. Dobbs, An "Engaged" Indicator for Doors.—4 918, H. Smith, Plane for Beading and Side Fillister.—4,931, H. Clark, Gullies, Traps, &c., in the Apparatus for Ventilating Drains, &c.—5,200, W. Burr, Water-waste Preventing Cisterns —5,807, J. Lander and W. Thompson, Bath Walling and Flooring Tiles —5,866, W. Thompson, Tyeing or Holding Together Door Frames, &c.—5,945, J. McNaughton, Water-closet Cisterns —6,524, W. Filking, ton, Kilns for Annealing Plate-glass —6,610, G. Hay-wood, Ventilators.—6,630, J. Griffiths, Street and other Pavements.—6,810, I. Singer and A. Berens, White Lead.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

6,747, C. Elliott, Exhausting or Removing Gases or Vapours, and for Ventilating Rooms, &c —8,668, B. Piffard, Varnishes.—9,493, J. and A. Duckett, Water-closets. — 9,977, R. Hickes, Ventilator. — 9,999, R. Halschek, Ventilating by Purified and Ozonised Atmospheric Air.—10,198, E. Waring, Supporting Railway Carriage Doors, &c.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MAY 4.—By *Ellis & Son:* 40, Mincing-lane, City, u.t. 12 yrs., g.r. 450*l.*, r. 1,112*l.*, 3,250*l.*—By *Rutley, Son, & Vine:* 66, St. George's-rd., Regent's-park, u.t. 49 yrs., g.r. 5*l.* r. 42*l.*, 375*l.*—By *J. Carey & Co.:* 49, Maury-rd., Stoke Newington, u.t. 84 yrs., g.r. 7*l.*, 380*l.*—By *F. Yarley:* to 7 (odd) Palmerston-rd., Holloway, u.t. 73 yrs., g.r. 28*l.* r. 120*l.*, 700*l.*—By *King & Chasemore:* "Rusper House Farm," Rusper, Sussex, f., 50a. 0r. 12p., r. 15*l.*, 1,300*l.*; enclosures of f. land, 54a. 0r. 15p., r. 10*l.*, 650*l.*; and 28a. 3r. 16p., f. Leith-hill, Surrey, 5,500*l.*; "Clark's Green Farm," Capel, 64a. 1r. 6p., f. 2,000*l.*; "Clark's Green Farm," northern position, 135a. 1r. 18p., f. 2,500*l.*—By *F. S. Priest* (at Willesden): Thirty plots of freehold land, Willesden, 1,921*l.*

MAY 5.—By *W. Copping:* 77, Ifield-road, West Brompton, u.t. 68 yrs., g.r. 8*l.*, r. 40*l.*, 360*l.*; 9, St. Ann's

Park-ter., Wandsworth, u.t. 75 yrs., g.r. 8*l*., r. 45*l*., 280*l*. —By *W. H. Keer*: F.g.r. of 70*l*. a yr., with reversion in 75 yrs., Notting-hill, 1,680*l*.; f.g.r. of 69*l*. 10s., with reversion in 75 yrs., 1,490*l*.—By *J. Hibbard*: 126, Mildmay-rd., Islington, f., r. 45*l*., 565*l*.—By *Debenham, Tewson, & Co.*: The residences "Rathcoole" and "The Lawn," Hornsey, and 10¼ acres, part f. and part c., 7,100*l*.—By *Driver & Co.*: "The Savings Bank," Peckham rd., u.t. 378 yrs., no g.r., area 10,100 ft., 1,000*l*.; F.g.r. of 15*l*., with reversion in 18 yrs., Lee-ter., Blackheath, 900*l*.—By *C. Slee & Sons*: 16 and 17, Leighton-grove, Kentish-town, u.t. 50 yrs., g.r. 12*l*. 12s., r. 60*l*., 545*l*.—By *Mullett, Booker, & Co.*: I.g.r. of 36*l*. 5s., Gloucester-pl., Paddington, u.t. 46 yrs., g.r. 4*l*. 5s., 570*l*.; i.g.r. of 45*l*., Porteus-rd., u.t. 45 yrs., g.r. 5*l*., 730*l*. By *Moss & Jameson*: 3, Pelham-cres., Kensington, u.t. 22 yrs., g.r. 12*l*., 780*l*.; 14 and 16, Queen's-rd., Dalston, u.t. 53 yrs., g.r. 9*l*., r. 83*l*. 14s., 555*l*.; 4, Clifton-hill, St. John's Wood, u.t. 46 yrs., g.r. 10*l*. 10s., r. 55*l*., 450*l*.; 10, High-st., u.t. 9½ yrs., no g.r., r. 55*l*., 300*l*.; 9, Portland-ter., Regent's-park, u.t. 9½ yrs., g.r. 10*l*., 200*l*. By *Messrs. Cobb* (at Rochester): Three freehold cottages, Miles-pl., r. 23*l*. 8s., 210*l*.

MAY 6.—By *J. & R. Kemp & Co.*: L.g.r. of 60*l*. 13s., u.t. 50 yrs., Walpole-st., &c., Chelsea, 1,110*l*.; No. 167, Clapham-rd., f., 1,250*l*.; 123, Borough-rd., Ratcliff, c., 800*l*.—By *Pettitt, Son, & Bryne*: 32, Warwick-st., Pimlico, u.t. 46½ yrs., g.r. 8*l*., r. 110*l*., 1,505*l*.; 17, Graham-st., u.t. 30 yrs., g.r. 6*l*., r. 46*l*., 490*l*.; 18 and 19, Rillington-pl., Notting Hill, u.t. 73 yrs., g.r. 13*l*., r. 74*l*. 12s., 545*l*.—By *Rushworth & Stevens*: 37, Albemarle-st., Piccadilly, f., r. 300*l*., 5,800*l*.—By *Matthews & Morris*: "Greenfield Farm," Felstead, Essex, 23a. 0r. 4p., f., 400*l*. —By *F. Jolly & Co*: 57, Osbaldeston-rd., Stoke Newington, u.t. 87 yrs., g.r. 8*l*. 8s., 455*l*.; 136, Abbott-rd., Bromley-by-Bow, u.t. 82 yrs., g.r. 5*l*., r. 33*l*. 16s., 230*l*.—By *A. Richards*: 5, Fortune-gate, Harlesden, u.t. 73 yrs., g.r. 4*l*., r. 26*l*. 8s., 325*l*.; 19, Stanley-rd., and 26, Canterbury-rd., Islington, u.t. 61 yrs., r. 70*l*. 8s., 500*l*.; 110, Spencer-rd., Hornsey, u.t. 61 yrs., no g.r., r. 24*l*., 300*l*.; F.g.r. of 5*l*., with reversion in 59 yrs., The Ter., Tottenham, 110*l*.; F.g.r. of 8*l*. 15s., with reversion in 59 yrs., Dorset-villas, 180*l*.; F.g.r. of 25*l*. 15s., with reversion in 59 yrs., Northumberland-park, 550*l*.; 4 to 6, Thomas-pl., f., r. 108*l*., 1,030*l*.; 2, 3, 7, and 8, Castle-pl., f., r. 69*l*. 15s. 4d., 715*l*.; Eight cottages, Fountain-sq., u.t. 13 yrs., g.r. 2*l*. 10s., r. 65*l*., 115*l*.; 188, Upper Fore-st., Edmonton, c., r. 30*l*., 470*l*.; "Marsh House," Angel-rd., u.t. 15 yrs., g.r. 4*l*., 200*l*.; "The Fountain Nursery," c., r. 20*l*., 510*l*.; 1 and 2, Angel Cottages, f., r. 23*l*. 8s., 230*l*.; 1 to 4, Rose-cottages, Ponder's End, f., r. 57*l*. 4s., 600*l*.; f.g.r. of 40*l*., with reversion in 48 years, Bonny-st., Camden Town, 900*l*.; 81, Camden-rd., u.t. 48 yrs., g.r. 12*l*., r. 70*l*., 800*l*.; 2, Dalston-lane, Dalston, f., r. 100*l*., 2,150*l*.; 157, Morninglane, Homerton, f., r. 30*l*., 280*l*.

MAY 7.—By *Newton & Co.*: No. 17, Canonbury Park North, u.t. 45 yrs., g.r. 9*l*., 770*l*.; 4, 5, 6, and 9, The Crescent, Edmonton, f., r. 72*l*., 755*l*.; 1 and 2, Crescent-cottages, f., r. 17*l*. 16s., 200*l*.—By *E. Stimson*: No. 350, Clapham-rd., f., r. 36*l*., 800*l*.; 25, Wenlock-st., Hoxton, u.t. 15 yrs., g.r. 4*l*., r. 30*l*., 155*l*.—By *R. Wood*: 9, Nightingale-rd., Bethnal-green, f., r. 18*l*. 4s., 245*l*.—By *Wilkinson, Son, & Welch*: 19, Charlotte-st., Brighton, f., 776*l*.

MAY 8.—By *G. Drewitt*: "The Newark Flour Mills," near to Byfleet, 24a. 3r. 0p., f., 2,550*l*.—By *Toplis & Roberts*: I.g.r. of 13*l*., u.t. 71 yrs., g.r. 4*l*., Clyde-st., Hampton, 360*l*.—By *Montagu & Robinson*: I.g.r. of 30*l*., with reversion in 24½ yrs., Worship-st., Finsbury, 3,600*l*.; I.g.r. of 115*l*., with reversion in 60 yrs., 7,200*l*.; 2, peppercorn rent, Dysart-st., with reversion in 15 yrs., 600*l*.; 24 and 26, Woodbridge-st., Clerkenwell, u.t. 22 yrs., g.r. 8*l*., r. 100*l*., 620*l*.—By *Hampton & Sons*: 28, Bainbridge-av., Kilburn, u.t. 67 yrs., g.r. 10*l*., 345*l*.—By *W. W. Jenkinson*: 2 and 3, Bank-buildings, Camberwell, r. 200*l*., 3,710*l*.; 4 and 5, Bank-buildings, r. 195*l*., 3,860*l*.—By *Heaps, Son, & Reeve*: 4, Brondesbury Parkvillas, Willesden, u.t. 77 yrs., g.r. 18*l*., 1,000*l*.

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; I.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.			TIMBER (*continued*).	
Greenheart, B.G.	ton	8/0/0	9/0/0	Satin, St. Do-
Teak, E.I..	load	8/10/0	14/0/0	mingo .....ft.
Mahoganies, U.S.ft.cn.		2/3	3/0	Porto Rico ....
Ash, Canada load		2/10/0	4/5/0	Walnut, Italian..
Beech, do.		2/5/0	4/5/0	METALS.
Birch, do.		3/10/0	4/15/0	IRON—Bar, Welsh,
Deals, &c.		2/0/0	3/15/0	in London .ton
Elm, do.		2/10/0	4/10/0	Do. do. at works
Fir, Canada		4/17/6	6/10/0	in Wales .....
Pine, Canada red		2/10/0	3/10/0	Do. Staffordshire,
Deals, do. yellow		2/0/0	3/10/0	in London ....
Spruce, do.		2/0/0	3/0/0	COPPER—British,
Staves, Pantile,		5/0/0	6/0/0	cake and ingot
Pitch, Archangel		5/0/0	7/0/0	Best selected ..
Quebec, Pine				Sheets, strong..
Deals, 1st & 2nd		7/15/0	10/10/0	Chili, bars ....
Do. 4th & 3rd..		7/5/0	8/5/0	YELLOW METAL, lb.
Do. Riga		6/5/0	7/15/0	LEAD — Pig,
Flooring, St. Petersburg,				Spanish.....ton
Do. 1st yellow ..		9/15/0	14/10/0	English, com.
Do. 2nd yellow		8/5/0	9/5/0	brands .....
Do. white		8/15/0	10/10/0	Sheet, English,
Do. Swedish		6/15/0	15 15/0	3 lbs per sq. ft.
Battens, Boards,		8/5/0	17/0/0	and upwards ..
Deals, Canada, Pine ist		13/0/0	24/0/0	Do. Staffordshire,
Do. do. 2nd....		9/0/0	15/10/0	in London ....
Do. do. 3rd, &c.		6/10/0	10/0/0	ZINC — English
Do. Spruce. 1st		8/10/0	11/0/0	sheet .....ton
Do. do. 3rd & 2nd.....		6/5/0	7/15/0	Vieille Mon-
New Brunswick		5 5/0	7 5 0	tagne.....
Planks, all kinds		3/10/0	15/10/0	TIN—Straits ....
Flooring Boards,				Australian ....
1 in. prep.				English Ingots
Do.		0/10/0	0/14/0	OILS.
Do. 2nd.....		0/9/0	0/10/0	Linseed .....ton
Timber qualities		0/8/0	0/7/6	Cocoanut, Cochin
Spar, Cubs ..ft.		/4	/4½	Do. Ceylon ....
Deals, do.		/4	/4½	Palm, Lagos ....
Battens, &c.		/4	/4½	Rapeseed, English
Mahogany, Cuba.		/4½	/5½	pale .....
Do. Domingo,				Do. brown .....
Honduras, cargo av		/4½	/6½	Cottonseed ref..
Mexican do. do.		/4½	/5½	Oleine .....
Tobasco do. do		/5½	/7	Lubricating, U.S.
Honduras do..		/5½	/6½	Do. refined .....
Tarpaulin, Turkey ton		4/0/0	13/0/0	TAR—Stockholm
Wainscot, Rio.....		10/0/0	20/0/0	barrel
Do. Bahia		9/0/0	18/0/0	Archangel ....

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ALMONDSBURY.—For building "Prospect House," Almondsbury, near Brist.l. Messrs Bernard & Drake, architects, Bristol:—

J. Blackwell	£782 17	E. T. Hatherly	£894 0
Geo. Tucker	754 14	R. Wilkins & Son*	603 0
Wm. Cowlin & Son	746 0	W. Handy	580 0
A. Tambling	700 0	Thos. H. Brown	509 0

* Accepted.

ASHFORD.—For the erection of farm buildings at Court Lodge Farm, Great Chart, Ashford, Kent, for C louel Tuke. Mr. A. R Stenning, architect, 121, Cannon-street. Quantities by Messrs. Mew & Gwenden, 121, Cannon-street:—

Wood	£1,037	Howland	£922
Baker	991	Steddy & Co	920
Peters	970	Knock, Ashford*	900
Giles, Burden, & Giles	950		

* Accepted.

AUDENSHAW.—For sewering a portion of Audenshaw-road, from Kershaw lane to Manchester road. Mr. J. H. Burton, surveyor, Ashton-under-Lyne:—

Worthington & Pownall		Underwood & Bros.	£264 17 0
Wm. Clarke	£373 8 0	Thos. Storer, Denton*	238 0 0
Wm. Clarke	357 19 0	F. Marland	230 0 0
Wm Bennison	273 1 0	* Accepted.	

BRISTOL.—For heating apparatus for new Board Schools, at Kingswood, for the Oldland School Board. Mr. W. L. Bernard, architect, 3, St. Stephen's-chambers, Baldwin street, Bristol:—

C. Gray	£1,020 0 0	Skinner & Board	£935 0 0
J. Jones & Sons	795 0 0	T. Wood & Co....	883 16 5
Rosser & Russell, Ltd.	766 11 0	J. Crispin & Sons	859 11 8
Wenham & Waters, Ltd.	755 0 0	G. Tunkard	845 7 6
		J. Weech	4.80 0 0
		S. Diplock	289 15 0

[Architect's estimate, £900.

* Too late. † Accepted. ‡ Informal.

BRISTOL.—For laying carriage-ways of Nicholas-street, Bridge-street, Small-street, and St. Stephen-street with wood paving (5,978 square yards), for the Urban Sanitary Authority. Mr. Fredk. Ashmead, M. Inst. C.E., 51, Prince-street, Bristol:—

Chas. Bradshaw & Son	£3,213 3 6	Jas. Durnford & Son	£3,188 5 4
		A. Krauss (accepted)	2,713 0 2

[All of Bristol.]

BRISTOL.—For alterations to premises, 8, Clare street, for Messrs. Frost & Reed. Messrs. Bernard & Drake, architects, 24a, College-green, Bristol:—

J. E. Davis	£525 0 0	R. Wilkins & Son	£479 12 8
E. H. Redd	504 0 0	J. Perrott (accepted)	478 0 0

BURTON UPON-TRENT.—For the erection of a new retort-house, iron roof, and other ironwork at the gasworks, for the Corporation. Mr. F. L. Ramsden, engineer, Gasworks, Burton-upon-Trent:—

J. & Wm. Horton	£1,442 1 5	E. Cockey & Sons, Ltd.	£1,015 13 3
Daniel Howard	1,317 16 5	Thornewill & Warham	1,003 0 2
Gough & Fetgate	1,172 7 9	E. C. & J. Keay	921 15 10
R. Dempter & Sons	1,098 15 10	W. C. Holmes & Co.	
J. Abbot & Co., Ltd.	1,087 17 9	Huddersfield*	870 4 6
Thos. Piggott & Co.	1,040 0 5	* Accepted.	

CAMBRIDGE.—For proposed additions and alterations to the house-block of The Leys School, for the Governors. Mr. Robt. Curwen, architect, 16b, Palmerston-buildings, E.C.:—

E. Lawrence & Sons	£2,570	S. & W. Patterson	£1,054
Holloway Brothers	2,145	Kerridge & Shaw	1,049
Kirk & Randall	2,124	J. L. Glasscock & Son	1,040
W. Saint	2,019	Bishop's Stortford*	1,005
J. Otway	1,964	* Accepted provisionally.	

CASTLE CARY (Somerset).—For the erection of new organ transept to the Parish Church, Castle Cary. Messrs. C. & C. B. Benson, architects, Yeovil. Quantities by architects:—

T. Lydford	£572 0 0	J. L. Francis, Castle Cary (accepted)	269 10 0

CHINGFORD.—For alterations and additions to the "Prince Albert" public-house, Chingford, Essex, for Mr. R. Parkinson. Mr. Fred. A. Ashton, architect, Stratford, E.:—

H. Whitty	£1,933	S. W. Hawkings	£1,539
J. Lilwall	1,723	J. Hughes	1,550
W. Shurmur	1,692	F. Voller	1,546
F. J. Nickolds	1,645	Heatle & Farrow (accepted)	1,478

CHINGFORD.—For erecting parish room, Chingford. Mr. W. Stair, architect:—

Wm. Shurmur	£891	Wilmott	£566
Wells	687		

EBBW VALE.—Accepted for various works in connexion with the extension of the waterworks for the Local Board. Mr. T. J. Thomas, Engineer, Local Board Offices, Ebbw Vale:—

Contract No. 1.—Supplying Cast Iron Pipes.

J. & S. Roberts, We t Bromwich	£923 10 6

Contract No. 2.—Supply of Valves, &c

J. Blakeborough & Son, Brighouse	131 18 6

Contract No. 3.—Pipelaying.

T. Jones Davies, Cardiff	280 11 6

Contract No. 4.—New Filter Beds, Tank, and New Road

T. Jones Davies, Cardiff	£1,823 0 0

GESTINGTHORPE (Essex).—For alterations and additions to Over Hall, for Mr. W. E. Oates. Mr. Arthur Blomfield Jackson, architect, 65, Chancery-lane, W.C. Quantities by Mr. J. Rookwood:—

Killby & Gayford	£1,120	Grimwood & Sons	£2,896
S. Parmenter	3,179	H. Munnacles, Halstead*	2,749 10

* Accepted.

HORNSEY.—For supplying a traction engine and steam road-roller, combined, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer:—

Wallis & Stevens	£905	Aveling & Porter, Rochester*	£841
Fowler & Co.	853	Green & Son	807
Fowell & Son	833	J. & H. McLaren	495

* Accepted.

LONDON.—For rebuilding the London Commercial Sale Rooms, Mincing lane and Mark-lane, E.C., for the Directors of the London Commercial Sale Rooms, Limited. Mr. E. B. Lamson, M.A., architect. Quantities by Messrs. D. Campbell & Son, 69, Finsbury pavement, E.C.:—

Ha l, Beddall, & Co.	£93,980	Peto Bros.	£91,910
Cubitt & Co.	92,825	Riggs & Hill	89,994
Grover & Son	92,000	Lawrence & Sons	89,758
Rider	92,158	Charters	88,887
Ashby & Horner	91,980	Chappell	88,866
Colls & Sons	91,833		

LONDON.—For erecting offices, Duke-street, Aldgate. Messrs. Bridgman & Sons, architects:—

Gre nwood	£4,576	Jocelyn, Young & Co	£3,957
Morter	4,464	Lawrence & Son	3,899
Nightingale	4,296	Dixon	3,884
Kirk	4,169	Tonn	3,883
Neave & Neave	4,000	S. R. Lamble (accepted)	3,787
Perry & Co.	3,997	Williams	3 549

LONDON.—For erecting shop in Walworth-road, for Mr. W. Hunlock. Messrs. Lander & Bedells, architects:—

Williams	£4,883	Burman & Son	£3,139
Smith & Son	3,720	Holloway Bros.	3,034
Ebbage	3,319	S. R. Lamble*	2,993
Mattock Bros.	3 193	* Accepted.	

LONDON.—For erecting pianoforte factory in Kentish Town-road, for Mr. Carr. Mr. W. H. Boney, architect:—

Davenall (accepted)	£1,550	0	0

LONDON.—For the enlargement of the Broomsleigh-street school, West End, Hampstead, by 394 places, for the School Board for London. Mr. T. J. Bailey, Architect:—

W. M. Dabbs	£4,521	James Longley & Co.	£3,940
Killby & Gayford	4,223	J. Bulls, Son, & Co., Ltd.	3,875
Patman & Fotheringham	4,162	S. & W. Pattman	3,764
E. Lawrance & Sons	4,010	Treasure & Son*	3,664

* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of a school to provide accommodation for 800 children on the site in Chaldmi-road, New Cro s, and for the erection of laundry and cookery centre, for the School Board for London. Mr. T. J. Bailey, Architect:—

Perry & Co.	£21,019	Thomas Boyce	£18,972
J. W. Hobbs & Co., Limited	20,498	J. T. Chappell	18,959
S. & W. Pattinson	20,074	Holloway Bros.	18,857
Treasure & Son	19,836	Hart Bros.	18,426
W. H. Lorden & Son	18,857	Kirk & Randall	17,713
		H. Lovatt*	17,275

* Recommended by the Works Committee for acceptance.

LONDON.—For cleaning, painting, and repairing the interior of the Brenda Road Industrial School, for the school Board for London. Mr. T. J. Bailey, Architect:—

E. Lawrance & Sons	£540	Atherton & Latta	£332
W. Gregory & Son	463	J. T. Robey*	337
F. J. Coxhead	481		

* Accepted by the Works Committee.

LONDON.—For the erection of a school to provide accommodation for 1,200 children on the site in Honeywell-road, Wandsworth, and also for the erection of a schoolkeeper's house, with a cookery centre underneath, for the School Board for London. Mr. T. J. Bailey, Architect:—

Penn Bros.	£22,000	Killby & Gayford	£20,249
Foster & Dicksee	20,840	J. W. Hobbs & Co., Ltd.	20,131
Hart Bros.	20,732	Holloway Bros.	19,969
J. T. Chappell	20,676	H. Lovatt*	18,959

* Recommended by the Works Committee for acceptance.

LONDON.—For erecting public library, Perry-hill, Lewisham, S.E., for the Lewisham Board of Works. Mr. A. L. Guy, architect:—

Waddington	£342 10 0	Christmas	£283 18 4
Sykes	304 0 0	Robson, Lewisham	290 0 0

* Accepted.

LONDON.—For rebuilding the "Greenan" Restaurant, Strand. Messrs. Sowerbutts & Martin, architects:—

E. Toms	£4,245	Bywaters	£3,788
S. Goodall	4,233	Gregory & Co.	3,727
W. Shurmur	4,194	Gould & Brand	3,697
Ashby Bros.	3,770		

LONDON.—For repairs at 35, Commercial-street, for Mr. E. J. Rose. Messrs. Wilson, Son, & Aldwinckle, architects:—

Todd	£545	Mills	£483
Shurmur	486	Staines	409

LONDON.—For erecting engine-room, chimney-shaft, &c., at Lower Thames-street, for the Laing, Wharton, & Down Syndicate. Mr. W. Bartlett, architect:—

Hobbs & Co.	£3,766	Stimpson	£2,960
T. Boyce	3,725	W. Shurmur	2,790
Pattinson	3,213	J. H. Mollett	2,780

LONDON.—For building ten cottages in Kennoure-avenue, Hackney. Mr. J. Hamilton, architect:—

Dabbs	£2,244	Hayworth & Son	£1,947
Godfrey & Son	2,227	Beale	1,900
Wm. Shurmur	2,196		

LONDON.—For the erection of Mission premises, Warden-road, Rentish town. Messrs. Spalding & Cross, architects, 16, Queen-street, E.C. Quantities by Mr. Bernard Swinstead:—

Pocock	£3,850	Outhwaite	£2,683
Dove Bros.	3,275	Gould & Brand	2,835
Jones	2,970	Holloway	2,800
Neave & Neave	2,950	W. & H. Castle, Southwark	
Shepherd	2,894	Bridge-road (accepted)	2,745

LONDON.—For renovations to Wycliffe Chapel and Schools Philpot-street, Stepney:—

W. Gladding	£225 0 0	Curtis	£145 10 0
Cleaver	184 0 0	G. Barber (accepted)	138 0 0
E. Tutt & Co.	151 15 0	W. Calmur	111 0 0

LONDON.—For erecting stabling at Loughborough Junction. Mr. Walter Hall, architect, 38, Chancery lane:—

Rowe	£250 0	G. Perry	£215 10
Isaac Whiteing	218 0	E. W. Mitchell, Brixton*	215 0

* Accepted

MOUNTS (Devon).—For the restoration of Woodleigh Church, St. Mary's Church, for the Vicar and Churchwardens. Mr. Geo. H. Fellowes Prynne, architect, 10, Torrington-square, London, W.C. Quantities by Mr. R. Reury Hale, surveyor, 6, Duke-street, Strand, W.C.:—

Laithorne & Good	£2,759 9 0	F. Vanstone	£1,778 0 0
Reed, Blight & Co.	2,500 0 0	W. Hurley & Son	1,645 0 0
Limited	2,378 0 0	J. A. Steere	1,499 5 0
Philip Blowey	1,853 0 0	Farr Bros	1,100 17 8

NEWCASTLE-ON-TYNE.—For rebuilding stone piers and walls &c., at cemetery, for the St. John, Westgate, and Elswick United Burial Board. Messrs Stockwell & Spicer, architects, 11, Pilgrim-street, Newcastle-on-Tyne. Quantities by architects:—

J. & W. Lowry	£1,380 0 0	Geo. Scott & Sons,	
Robt. Veitch	944 18 0	Douglas* terrace,	
W. & W. Scott	890 1 0	Newcastle-on-Tyne*	£850 0 0

* Accepted.

NORTHWICH.—For the erection and formation of a new cemetery at Witton, for the Witton and Dane Bridge Burial Board. Mr. James Holland, architect, Castle, Northwich. Quantities by the architect:—

		Boundary-walls.
Winnard	£1,025	£1,450
Hamilton	2,000	1,450
Leicester	3.02	1,249
Morris	2,025	1,477
Sydlance & Sons, Northwich (accepted)	1,790	925
Matthews (too late	2,455	885

ORPING-TON (Kent).—For decorative repairs and painting works to houses. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C.:—

W. R. Taylor	£366 0	Holt & Son	£347 0
McLachlan & Sons	307 15	Somerford & Son*	295 0

* Accepted.

PONTYPOOL.—For the erection of a master's house and premises, at Pontnewynydd, for the Trevethin School Board. Mr. E. A. Lansdowne, architect, High street, Newport, Mon.:—

H. A. Lloyd	£420	W. Pontypool	
Morgan & Evans	407 0	(accepted)	£403 10

PONTYPRIDD.—For the erection of twenty four cottages at Ynysybwl. Mr R Llewellyn, architect, Ynysybwl:—

J. Howells	£3,768	J. Rees (accepted)	£3,720

[Both of Ynysybwl.]

PRESTATYN (North Wales).—For the erection of a day school and outbuildings. Mr. J. H. Burton, architect, Warrington-street, Ashton-under-Lyne:—

J. Wilhams & Son s	£600 0 0	Jones & Roberts	£495 0 0
Wright & Son	599 0 0	J. Pritchard	455 0 0
W. Williams	591 17 10	G. Raines, Prestatyn	
F. Foulkes & Sons	495 0 0	(accepted)	408 5 0

READING.—For the erection of the western portion of a chapel at Bradfield College. Mr. J. Oldrid Scott, F.S.A., architect, 35, Spring-gardens, S.W. Quantities by Mr. H. L. Beckwith, 14, North John-street, Liverpool:—

Lovell	£5,925 0	Botterill	£4,674 0
Franklin	5,507 0	Thompson	4,658 0
Dove Bros.	5,010 0	Kimberley	4,576 0
Dobson	4,986 0	Webster & Cannon	4,500 10
Higgs & Son	4,861 0	Wheeler, Reading*	4,386 0

* Accepted.

RICHMOND (Surrey).—For making up private streets. Mr. Walter Brooks, Borough Surveyor :—

	Lancaster Park.	St. George's-road, Trinity, &c., Roads.
B. Cooke & Co.	£1,930 0 0	£1,439
J. G. B. Marshall	1,740 0 0	—
Neave & Son	1,068 0 0	1,293
Nicoll & Ribson	1,658 0 0	1,271
E. Hawkins	1,400 0 0	975
D. W. Lewis, Southsea	1,380 0 0	*960
W. H. Wheeler	1,300 0 0	1,074
J. Munro, Richmond	*1,272 3 6	1,009

* Accepted.

ROMFORD.—For new infirmary and other works at Romford Union Workhouse. Mr. Frank Whitmore, architect, Chelmsford. Quantities by Messrs. Stanger & Son, London :—

	Dining Hall, Kitchen, &c.	Infirmary.	Total.
Woodard & Co.	£5,700	£17,100	£22,800
S. & W. Patterson	6,738	16,591	22,329
B. E. Nightingale	5,588	16,576	22,164
J. Shillitoe & Son	5,800	16,100	21,900
Perry & Co.	5,718	16,081	21,794
Holloway Bros.	5,415	16,121	21,536
G. Grimwood & Co.	5,617	15,679	21,296
Jos. Holland	5,262	15,314	20,576
H. Everett & Son	5,147	15,247	20,394
J. S. Hammond, Romford*	4,953	13,640	18,593

* Accepted.

ST. ALBANS.—For the erection of a residence for Mr. W. H. Spear, at St. Albans. Quantities by Messrs. Cuxon & Leigh. Mr. F. W. Kibner Pite, architect, 26, Furnival-street, Holborn :—

	Residence.	Sanitary work.
J. & W. Savage	£4,174 0 0	£292 0 0
W. G. Denman	4,750 0 0	290 0 0
Boff Bros.	3,925 0 0	311 0 0
C. Misbin	3,540 0 0	280 0 0
Turner & Co., London, Watford (accepted)	3,387 0 0	274 0 0
R. P. Beattie	—	315 0 0

ST LEONARDS-ON-SEA.—For alterations, additions, and improvements at the "Royal Victoria Hotel," St. Leonards-on-Sea. Mr. Arthur Wells, architect, Hastings :—

Thos. Silter	£4,629
T. Lester	4,607
Elder, Ice & Cruttenden	4,522
H. E. Cruttenden	4,508
A. H. White	3,124

For Hydraulic Passenger Lift.

W. J. Adams	£474
Taylor Bros., Hastings	—
(accepted)	4,389
Waygood & Co., London (accepted)	£575 0 0

ST PAUL'S CRAY (Kent).—For the erection of stables to private residence, Mr. St. Pierre Harris, architect, 1, Basinghall-street, E.C. :

Somerford & Son	£521
R. A. Lewis	487
D. Payne	485
T. Knight	£171
W. Owen (accepted with modifications)	449

SHALFORD (Surrey).—For alterations and repairs to the "Parrot Inn," Shalford, near Guildford, Surrey, for Mr. E. Best H. Mr. Fred A. Ashdown, at Great Strafford, E. :

Hearle & Pirbo	£50 0 0
J. & F. Bate	521 0 0
Mat Bell Bros.	£42 0
F. L. Downes, St. Neots	16 10

* Accepted.

SOUTHBOURNE (Hants).—For the erection of house at Southbourne, for Dr. Yelverton Dawson. Mr. A. R. Stenning, architect, 121, Cannon-street :

Hoare	£ 191
Palmer	6,040
Sabey, London*	£2,987

* Accepted.

SUTTON (Surrey).—For erecting three pairs of small villa residences at Sutton, for Mr. A. Saunter :

Hy. Adams	£1,285 0 0

[No competition.]

UPPER WARLINGHAM (Surrey).—For the erection of a new billiard-room and stabling at "Hintfield," Upper Warlingham, Surrey, for Mr. H. D. Rawlings. Mr. David Burnett, F.S.I., architect :—

	Billiard room.	Stabling.	Total.
T. Little	£797	£407	£1,204
J. Horrocks	500	498	998
W. Marrisse, Croydon (accepted)	423	365	788

YEOVIL.—For the erection of a factory in Addlewell-lane, for Messrs. Clothier, Hitchcock, Coles, & Co. Messrs. C. & C. B. Benson, architects, Yeovil. Quantities by the architects :

Carey	£1,125 10 0
Walbridge	1,067 14 0
Lye & Sons	971 16 5
Green	920 0 0
Bird & Pippard	£917 0 0
Hutchings	913 17 4
Andrews, Thornford*	810 0 0

* Accepted.

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The Builder.

Vol. LX. No. 2530. Saturday, May 23, 1891.

ILLUSTRATIONS.

Wall Decoration, "The Tree of Jesse," leading into Lady Chapel, Folkestone Parish Church.—By Mr. A. O. Hemming ..... *Double-Page Ink-Photo.*
St. Mary's Church, Newbury: Exterior View.—Mr. A. E. Street, M.A., Architect ..... *Double-Page Photo-Litho*
Figures from Window in the Church of St. Mary, Stamford.—Designed by Mr. C. W. Whall ..... *Double-Page Ink-Photo.*
Derbyshire General Infirmary, Derby.—Messrs. Young & Hall, Architects ..... *Double-Page Photo-Litho.*

Blocks in Text.

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The Two "Salons" at Paris.

We have waited till the Champ de Mars Salon was open as well as the old one, to make some review of the French art of the year. Neither collection is equal to that of last year, and the result seems to show decisively the mistake, in an artistic sense, of the division in the camp. The new Salon is the more refined collection, and by far the pleasanter to look at from the less crowded hanging and the lower level to which the pictures are kept. At the old Salon there is the usual enormous expanse of paintings, and more than the usual proportion of things which are odd, uninteresting, or simply bad, though of course a considerable number of fine things can be picked out from this large collection.

The immense space covered is partly due to the great size of some of the works. These huge canvasses seem to grow larger every year. Some of these are decorative pictures for public rooms, others seem painted as immense *tours de force*. The most justifiable of these is M. J. P. Laurens' "Voute d'Acier," commemorating the reception of we forget what eminent personage (the catalogue is silent on the subject) at the Hôtel de Ville of Paris, where an arch of crossed swords is formed by men standing in a parallel row up the steps. This is painted in a flat fresco-like style suitable for mural painting, and is a very fine work, rather spoiled (decoratively) by the great space taken up in the foreground by the steps and the rough railing put up them, which is not an effective foreground object. M. Rochegrosse's "Mort de Babylon," on the other hand, is a gigantic easel picture, containing some superb painting of architecture and (of course) a heap of sprawling women in the foreground. As a power as a painting however is undeniable. M. Aubert's "Saints Patrons de la Ville des Champs" is a painting in wax intended for the apse of Notre Dame des Champs. This is a group of people bringing various offerings of cattle, flowers, and fruit to a central altar; a young girl in white, with a lily, kneeling in the centre. The figures are rather deficient in individual interest, and the whole composition entirely conventional, but on that account the better suited for its intended position. M. Ferrier's ceiling painting for the French Embassy at Berlin, "Glorification des Arts," is one of the old-school ceiling paintings with figures flying all over it and with little meaning, but it is bright and certainly decorative, and its tone of colour suitable for a ceiling. M. Rouffet has made a great painting which is evidently popular on patriotic grounds, "La Fin de l'Épopée," representing an incident of the Battle of Waterloo evolved from the historical imagination of Victor Hugo, viz., the failure of the last charge of the French cavalry from their coming on an unexpected ravine or ditch, into which they rolled over on each other before they could pull up, and which accounts for the final issue of the battle. A diptych painting by M. Vimont for the decoration of the Salle des Mariages (we presume) of the Mairie of Lilas, "La Jeunesse: la Famille" is one of those realistic mural paintings which have come a good deal into fashion in Paris of late, and which to our thinking are not decorative or mural painting in the true sense. Among these large paintings is one truly poetic work by M. H. T. G. Martin (a pupil of J. P. Laurens), "Chacun sa Chimère." A file of typical personages, "condemned for ever to go on hoping," march across a sandy waste, in the midst of them a great white-robed figure of Hope with wings pointing upward. A man in the front rank carries a Victory and laurels, a monk by his side looks upward in aspiration; a mother walks behind nursing her child—that is her "chimère," and some far sadder examples follow. What the French call the *facture* of the painting is odd, misty, unreal, perhaps purposely so, to keep it out of realism; but the idea is fine and impressive.

What the French paint at present is of interest to note, as well as how they paint it: their range of subjects is certainly wider than ours. We do not know however, that the increasing habit of painting life-size scenes of everyday life, with no attempt at pictorial effect, is quite the best use to make of a large expanse of canvas. This is an increasing tendency at present. In the new Salon, for instance, is a huge painting looking up the interior of a terminal railway station, with a few passengers and porters walking down the platform, and the front of the locomotive facing the spectator; it is well done, but who is the better for it? In the old Salon we have a typical example of the class, in M. Bramtot's "Le Suffrage universel," the interior of a bare office, with a few figures standing about voting or preparing to vote; the types of classes represented are well studied, but pictorially it is a bare and uninviting work. Of the immense number of figure pictures of various types merely a few can be picked out here, nor is it very easy to classify them except to a limited extent. Of figure paintings of the more ideal type M. Bouguereau has two, pretty and sentimental as usual, "Premiers Bijoux," a girl of the golden age making earornaments of cherries handed to her by her lover, and "L'Amour mouillé," Cupid sheltering under the trees from a shower. Both are of course admirably drawn and of an ivory prettiness of texture and tint (the colour of Cupid's arsenical green trees, however, rather sets the teeth on edge), but both belong to the region of learned mediocrity: M. Bouguereau gets always to a certain point of excellence, never (or very rarely) beyond it. As to the other figure studies, there are two distinct reasons for painting "the nude," one the representation of the material beauty of the living body, coupled with the painter's interest (little understanded of the people) in mastering the greatest difficulty of his art; the other the use of the abstract human figure in poetic ideals with which the materialism of dress has nothing to do. There are plenty of studies in the Salon, no doubt, that come, as far as we can see, under neither head. Among those of the first class, in which the simple painting of the figure is the object, one of the finest is M. Benner's "Jeunesse," which is a beautiful piece of work: and another admirable picture, of a very different class of execution, is M. Layraud's "La Sculpture," a half-draped female figure at work on a statue; a sketch for a decorative panel for the Salle des Arts at the Hôtel de Ville, though this perhaps should be classed with ideal figure painting. Among the purely poetic figures are M. Henner's

"Pleureuse," remarkable for the fine rich colour of the whole, figure, drapery, and background; M. Lefebvre's "Nymph Chasseresse," M. Berthault's "Dernier Nuage de la Mist," a floating figure with a dusky veil behind it, fine in line, painted with a certain mistiness and reticence which removes it entirely into the world of idealism, and M. Boyé's "Crépuscule," in which a half-lighted figure stands with her back to the spectator, among trees and in front of a moonlit pond, figure as well as landscape resolved into the uncertainty of twilight. A critic of a cynical frame of mind might perhaps say that this method of treatment avoids some of the principal difficulties of figure painting. This is poetry of a kind, however; so is Mr. Fantin-Latour's "Tentation de Saint Antoine," a reminiscence of the feeling and grouping of Titian in a much subdued key. M. Gervais' painting of the "Saintes Maries," landing from a boat in which they had been cast adrift, according to we know not what curious legend, is ludicrous as a conception; the idea of a "Sainte Marie" in the coquettish figure getting out from the boat is too absurd, though there is a fine broad style and originality of colour in the picture. M. Bonnat's "La Jeunesse de Samson," Samson rending the lion, offers an example of a vigorous study of the male figure, but the lion is more vigorous still, and in a conflict of muscular force it is mechanically impossible that man could pull about that lion as he pleased; the painter has taken an ordinary strong young man as his model, whereas Samson should have been represented as almost supernatural in his development. Albert Dürer's treatment of the subject comes nearer the mark in this respect; but Albert Dürer had imagination, while modern painters are so anxious to follow a model correctly that they too often leave imagination to take care of herself.

Among the great variety of the other figure pictures a few of the best only can be noted in passing. M. Beaury-Saurel's "Travail" is an interesting and pictorial work representing a young woman seated before an easel reading, with a white canvas, on which is seen the first sketch of a picture, as the background to her warm buff dress. It may be a portrait, but artistically it is an incident of pose and colour. M. Bertaux "Leçon de Violoncello" is another of those pictures in which one or two figures are planted in the middle of a large floor-space; a boy studies a difficult passage before his teacher, straining his whole attention on his task; this seems to be a studio of all arts, for at the back is a stretcher with a very large architectural perspective lined in, and to the left is a young man on a ladder at work on a large picture. M. Bloch's painting of Franc-tireurs in the snow engaged in pulling up the rails for the wreck of a hostile train, is one of the best of the war pictures of the year. In "Le Laminoir" M. Bordes has endeavoured to make a picture out of the operation of welding steel coils on a gun. M. Bontigny's death of General Raoult at Woerth is another good battle picture, and the large painting by M. Brouillet of the Comédie Français in 1870, made use of as a hospital, is an interesting bit of history, the corridors of the building, with their festive architectural appearance, forming the setting to a series of wounded victims of the war. M. Chevilliard's "Une Repetition" is an admirable little study of character, a choir of children and girls to whom a stout priest beats time. In "Un Membre du Conseil des Dix" M. Debras has painted a study of a powerful aged head of a man otherwise enveloped in a scarlet gown. "Un Asile de Nuit" by M. Geoffroy, is another of the large paintings of every-day life, an interior of what would be called here a woman's casual ward; this is a fine work with both pathos and character in some of the figures. M. Gérome, whose lion hunting amid a desert landscape we noticed last year, has followed this by a large rocky landscape in the foreground of which is a "Lion aux Aguets"; at first sight the work seems to have little in it, but it grows upon one on study; this savage beast in the foreground, the one living creature in the landscape, has an ominous effect, though it is not equal to the hunting lion of last year. M. Haquette's "Le Premier Embarquement du Mousse" is a picture a little reminding one of Mr. J. C. Hook, in general feeling and motive; the figures in the foreground are well studied and characteristic, and there is a freshness in the scene which we certainly do not find in all French sea-coast painting of the day. M. Lecomte-de-Mouy's "Le Dieu et la Mortelle" is stated to be "fragment d'un triptyque sur l'amour," and is a work which in style and colour somewhat carries us back to the days of Ingres; it represents Jupiter in a kind of semi-human disguise grouped with Baucis as the "Mortelle," the colouring is of a warm and effective but somewhat commonplace type, the picture is interesting as a kind of survival of a past style. Mr. Lehoux's large picture of "Ulysse et Télémache" looks like a study for tapestry in antique style, and is eccentric enough even from that point of view. Ulysses and his son sit beneath the walls of a kind of model house, which might be timber, canvas, stone, or anything; around is a waste surface of ground on which a Noah's ark kind of dog and some tufts of Noah's ark vegetation are planted here and there at random. This is a curious example of the eccentricities into which some French painters are now wandering apparently in the endeavour to find some new outlet for painting; the picture suggests the idea of being a joke, though a somewhat large and formidable one. M. Letourneau gives us in "Le Salle des Titres du Credit Foncier de France" another example of the large painting of everyday scenes; it is more finished and composed, perhaps than "Suffrage Universel," but little is made of the expressions or characters of the waiting people; it is simply the scene as you might see it any day on casually looking in. This is a kind of reaction against sensationalism, no doubt; but if respectable and safe, it is certainly, from an artistic point of view, dull. We may just mention among other works M. Lemattre's "Le Dernier Voile," an admirable piece of figure painting; M. E. Luminais' "Fin d'un Roman," a duel scene in which both figures and landscape are finely treated and seem to help each other out in giving the melancholy impression of the story; Mdme. Luminais's small "St. Michel Chassant Lucifer du Ciel," a fine bit of drawing of the falling angel; M. Micheléna's large painting "Combat d'Amazones," a tumultuous mass of horses and nude figures, showing great ability but withal not very interesting; Mr. Pearce's "Un Enterrement Civil," a very pathetic work and showing a great deal of study of character in the figures of the peasant women seated in the foreground (the artist is an American by birth and pupil of M. Bonnat); M. Pezant's "Vache Blanche au Bord de la Mer," a fine piece of animal painting; M. Roy's "Le Reveil, lendemain de Solferino," not a first-class military painting, however, at least not for a French artist; Mr. Swan's "Maternité: lioness and cubs," which has been seen in London, and is one of the best works in its way in the Salon; M. Vibert's "Cordon bleu," which seems to have great popular attraction, and is a most brilliant piece of cabinet painting; and last but not least M. Tattegrain's beautiful work "Vérotières au petit jour," the only one from his hand. This represents an expanse of dark shore with figures digging on it, uncertainly seen as shadows carrying lanterns. The effect of the lantern light is given with remarkable reality, and the picture is perfect as a study of a special effect, but one rather expects something more than that from M. Tattegrain.

Among portraits, the finest of the year is perhaps M. Cormon's "M. Gérôme," who is represented standing, clad in a grey coat and painting on a small sculptured figure set on a table before him; the face looks out of the canvas as if at some object the painter is copying from, a thin nervous eager countenance; a very fine portrait of a great artist. M. Benjamin-Constant sends a grand-looking portrait of Mdme. Benjamin-Constant, in black velvet, the costume and head alike painted with great power, though it may be thought that the costume forces itself rather too prominently on the attention. M. Delaunay's large portrait of Cardinal Benadou in his robes is a study in reds with a rich crimson curtain in the rear, a Romanesque column, part of a church, is an accessory. The effect of the draperies is to make the face rather cold, this would be so in reality, but possibly should have been amended in painting. M. Dieudonné's "M. W. . . , Consul de France," is a fine example of portraiture pure and simple. M. F. Flameng sends a sumptuous portrait of "Mdme. P. . . .," descending a staircase, clad in a rich satin dress, the hands and arms beautifully drawn, the pose of the figure noble; a carved sphinx surmounts the stair-newel. Among other noticeable works are M. D'Issoncourt's "Mdme. la Comtesse . . .;" M. Maurice Jeannin's portrait de "M. G. J. . . . ," very much of the modern school, a man seated with his hat on, on a high stool in the middle of a bare floor and with a white wall behind, from which the figure stands out strongly; M. Lemeunier's small portrait of M. Detaille at work on a ladder in his studio; M. Mengin's "J. Baudry," a fine painting of a boy with a dog; M. Munkacsy's rather staring portrait of "Madame B——" in a light primrose dress with a yellow cloak—a leaf out of the book of Carolus-Duran; Mr. C. S. Pearce's full-length portrait of a lady in dark dress attaching a flower to her corsage; M. Saint-Pierre's of the "Comtesse Edgard de T——" in an Arabian costume, a most brilliant piece of work of its kind; and another highly decorative portrait by Mr. Julian Story, "Mdlle. Eames," in a dress rich and very harmonious in colour.

The mischief of French landscape painting, to our thinking, is the want of sunlight. There are brilliant (in every sense) exceptions this year, and the State seems to be bent on accentuating this quality in landscape, having purchased several of the most sunlit works. Among these (not so purchased, however) is M. Bourgeois "Pâtures Normands," a beautiful glade with sunlight shining through the trees, and M. Cagniart's "La Neige sur les Buttes Montmartre," a snow-covered slope with the house-roofs seen below, a very real work. M. Dupré's "Un Chemin au Mesnil" purchased by the State, is a very powerful work, looking up a lane with old barns in the foreground, the buildings painted with great power, but the whole in keeping; the same artist's "Dans l'Herbage," a cattle picture, is equally full and broad in execution. The State also possesses M. Dufour's "Pont St. Bénézet, Avignon"; there are one or two other Avignon paintings, topographical rather than pictorial. M. Fauvel, in "Les Fonds de Beaurepaire," reminds one of De Köning in the treatment of the distance. "Plein Midi, Auvergne," by M. Gagliardini, a State purchase, is a nook of a landscape, with white houses under a strong sunlight, very forcibly rendered. M. Leenhardt's "Un Soir en Galilée," with figures representing the walk from Emmaus, and his "Au Petit Jour Levant," are fine landscapes of rather solemn feeling; and "Sur la Falaise, à Etretat," by M. Le Poittevin, is a fresh and breezy coast scene. M. Olive's "L'Île de Maire, environs de Marseilles" shows rocky islets in very strong sunlight, contrasted with a sea rather too deep in colour for the bright light on the land; it is the kind of thing Mr. Brett has sometimes done, but cannot claim to equal him. Another State purchase, "Verdun" by M. Petitjean, is a fine picture of the kind; an irregular mass of old houses rising above the river. M. Vauthier's "Bassin de l'Arsenal" is a Paris picture purchased by the city; not remarkable. M. Hareux' "Nuit d'Août," a town scene, is a brilliant effect of moonlight. M. Japy's "Soi-d'Octobre" is an example of what we complain of in many of these large French land-

capes of the day; it is a fine scene, but a dead reen on the hills and no look of air or light. M. Quignon's "Les Regains" is a fine work of class of which there are good examples in ur own Academy, an expanse of field nd rank vegetation; it is not a beautiful cene, but there is truth and breadth f treatment in it. M. Renouf sends a great ard picture of Brooklyn Bridge in evening ght, striking mainly from its size. The sea aintings generally are more ambitious than uccessful. We doubt if French painters rn sailors and study the sea in all its aspects s ours now do. M. Chigot's "Perdus au arge," a great picture of a boat and men in rough sea, gives the situation and movement f the boat powerfully, but the water has ot the consistency or surface of water. Pendant le Tempête," by M. Maillard, is nother tremendous storm scene, a collision a steamer and ship, in which the sea is ner, but the whole thing rather sensational, nd the ships badly drawn. We may men- on, in the rather questionable field of deco- ative landscape, M. Le Liepvre's "Un Coin Luxembourg—panneau pour l'Hôtel de ille," in which the problem of reducing a rden scene to a decorative treatment has een fairly done.

The exhibition contains a few splendid eces of still-life painting; M. Fouace's Dejeuner de Chasseurs" and "Ma Chasse," game picture; and M. Monginot's "Dans office" and "Dans la cuisine." The beauty of ese last is that they give not merely realism, nt realism combined with a kind of exposi- on of how painting can handle such subjects; ere is no attempt at illusion, but a fine oad, bold, translation of the qualities of ght, surface, and colour of the objects repre- nted, into pictorial effect. M. Rouby's Après le Nettoyage" represents the sublime great shining copper vessels; and M. ollon, in "Argenterie," glorifies the work of e silversmith in the same fashion.

In sculpture there is the usual number of hibits, but alas! what a falling off from st year, an absolute catastrophe. The ulpture collection last year was a splendid ie, but the impulse does not seem to have en renewed, and the number of works of gh interest is very small. M. Falguière as a beautiful "Diana," a nude figure fol- wing with her eyes the arrow just dis- arged, with the beautiful type of small and *piritueł* head in which this sculptor's female gures are quite unequalled; but it is not ite equal to the noble "Juno" of last year. here is however nothing else to name with in the Salon. M. Allar's group of Jeanne Arc and her patron saints, for the new asilica at Domrémy, should hardly be judged xcept in its intended position; it should ave a fine decorative effect there. M. Bar- oldi's "Alsace et Lorraine se réfugiant au ed de l'autel de la Patrie," two seated back-to- ack figures holding children, is a respectable iece of decorative sculpture, not inspiring. mong other things may be mentioned M. A. oucher's colossal nude figure of a man igging, "A la Terre," a figure of consider- ble grandeur and energy; M. Chapu's kneel- ig figure of "Cardinal de Bonnechose," ith gilt crosier beside him, the drapery fine, ut it is rather a difficult subject for a ulptor to render interesting; M. Cordier's olossal equestrian statue of General Lasale, which the cavalry uniform is very much t variance with sculptural requirements; M. elaplanche's kneeling figure of "Eve avant Péché," a finely-modelled figure; M. elhomme's colossal statue of Carnot; M. errary's "Phryne," remarkable for the haracteristic expression of the head, which istinguishes it from mere average nude statues ith classical names; M. Houdon's "Repos e Diane;" M. Holweck's "Vestale allant au upplice;" M. Laoust's "La Musique," a raped figure with lyre, fine in action; M. evasseur's monument to Comte, a pedestal ith bas-reliefs and a seated figure of the ilious philosopher on the top; and the same culptor's nude figure called "Inspiration." ne cannot quit the sculpture without a word f indignation against M. A. Paris's screech- ing figure of Danton for the intended monument at Paris,—one of the worst and most vulgar pieces of monumental bronze sculpture we ever had the misfortune to see.

At the Champ de Mars Salon sculpture has been charmingly provided for in a great glass-covered garden court in a part of the building formerly consisting of picture-galleries, the intermediate floors and partitions having been removed. Unfortunately the show of sculpture is meagre in quantity and of little interest generally in quality. Nor has the promise of a gallery of decorative art been carried out, about which so much was said. There are a few objects in pottery and silversmiths' work, &c., scattered about the galleries, but nothing of any special interest. The central point of the Champ de Mars Salon, where the pictures of each artist are for the most part grouped together, is the splendid collection of portraits by M. Carolus-Duran, who may be called the Vandyke of the present age. This is not the most intellectual class of art, certainly; but the Parisian aristocrat lady in all her armour of gorgeous attire is nevertheless an object well worth painting, and providence clearly appointed M. Carolus-Duran to paint it. All the portraits are fine, both in the brilliant execution of the costumes and in the fine pose of the figures; there are nine of them, among which perhaps we may prefer to all the "Miss L——," presumably either an English or an American lady, but very Parisian (or Parisienne) in style and physiognomy; she stands, her head a little posed on one side, with drooping right-hand holding a bunch of flowers, dress a delicate pink, with crimson curtain for a background; a model of a portrait *de luxe*. The finest one next to this is a portrait of "Mdme. C——," a seated figure in light primrose-tinted satin with a grey furred cloak, and again the favourite crimson curtain in the background. The same care is visible in all the portraits; none of them are slurred over or hastily painted, which, alas! cannot be said of all portraits by our most eminent portrait-painter. In the midst of these glories of silks and satins the painter has shown what he can do without their assistance, in his nude "Danaë," as fine in colour and execution as any of the clothed figures.

The end of one gallery is occupied by M. Puvis de Chavannes' large decorative picture of "L'Été," for the Hôtel de Ville. The painter has succeeded in giving a fine decorative treatment of landscape, the massive cluster of trees in the centre is very fine, the bathing figures in the foreground are not very beautiful or interesting. The painter has two other decorative pictures of more realistic class, "La Poterie" and "La Céramique," for the staircase of the Musée Céramique at Rouen. These are figures of men and women engaged in pottery work, and are pleasing, hardly more. We fear "Puvisme" is rather on the decline, but it is not every painter who can claim to have invented and led a new style for nearly a generation. We can only glance at a few others of the prominent works. M. Jean Béraud has made a curious experiment in what may be called moral painting in his "La Madeleine chez le Pharisien." This is the scene, "Let him that is without sin among you cast the first stone at her," transferred to modern life; a dining-room round which are collected an admirably-studied group of men of fashion and position; every countenance is a separate and individualised study, but among them is seated the figure of Christ in flowing garments and with the nimbus round His head, and at his feet falls a woman in brilliant modern dress! It may sound absurd, but the effect is powerful and pathetic; and after all does not the painter suggest a very pregnant thought—what would be the attitude and feeling of Christ towards modern society of the more fashionable and self-indulgent class? Curious as the medley seems, the effect of the work justifies it. This is a small cabinet work, very highly finished. Among the large paintings, which also find their place here, is M. Binet's "La Sortie," a scene of the Siege of Paris, a crowd accompanying and cheering the march out of some troops. This is a success; it is real without losing decorative character. This painter is also the author of the railway station picture before referred to. M. Chabas's two decorative pictures for the Mairie of Montrouge, "Repas Nuptial" and "La Famille" are good in a decorative sense, but most of the figures in the first-named are unredeemably vulgar; people who—

"Hold a high position in the lower middle class."

In the "Famille" the young mother seated on the grass with her infant is a very pretty figure. M. Dagnan-Bouveret has an admirable work, "Les Conscrits," four or five conscripts following a boy with a drum and tricolour, their countenances seen in profile one behind another. M. G. Dubufe's two decorative panels, "La Cigale et la Fourmi" are clever, but rather *cinquant* in colour. M. Friant's "Ombres portées," two figures with their shadows on the wall, is clever and original, and his portrait of the two Coquelins admirable. M. Gervex's ceiling for the Hôtel de Ville, "La Musique," is too absurd. At the foot of the composition are the heads of persons in the stalls of a concert-room; above is a big woman playing a violoncello in the clouds, and surrounded by flying figures. M. Gilbert calls his painting of a goods railway station decorative, which is just what it is not; it is meant for the Salle d'Audience of the Chamber of Commerce, but will never look well as a wall-painting. M. Lerolle gives us a flight into Egypt with a very real group of figures and donkey in a very real landscape, but followed by a troup of flying angels; the two parts of the picture do not belong to each other. M. Marest's "Jeune Femme Dessinant" is evidently in reality a portrait, but treated as a picture interior with figure, with great effect and fine colour.

Among portraits, other than those already mentioned, attention should be directed to M. Boutet de Monvel's curious but very effective "Portrait de Jeune Fille"; M. Carrière's oddly-composed and affected but very clever portrait of M. Alphonse Daudet; the group of portraits by M. Courtois; M. Sargent's splendid "Portrait de Jeune Garçon," a model of fine free execution and life-like expression—why does he not always paint like this? A collection of small portraits by M. Weerts is also well worth attention.

There are some lovely little landscapes which find a more fitting home in these galleries than in the more crowded collection of the old Salon, where they would be killed. Among these is M. Rixens' coast scene "Les Graves d'Houlgate," a beautiful landscape, and a couple of small sea paintings, better than anything of the kind in the old Salon. M. Dauphin's paintings about Toulon give very vividly the glare of the light southern sunlight. Mr. Harrison's sea paintings are really remarkable; he is a New York artist who may (or does) run Mr. Henry Moore very close, which no French sea painter could do, as we believe the French admit since they made the acquaintance of his works in the 1889 Exhibition. There are two fine works by Mr. Moore himself.

The new Salon is interesting and inviting as a contrast to the old; fewer pictures, often more delicate and refined, and pleasanter and better-lighted galleries. But it does not seem to attract visitors away much from the other gallery, and the rooms on the day of our visit were very empty. It must be added that things seem to be admitted, to fill up space, which it is almost an impertinence to hang in any first-class exhibition, and if the "Salle des Refusés" contains worse things than these, it must indeed be a chamber of horrors.

The best thing we can wish is that the two Salons should unite again, and then proceed to reduce the numbers and raise the standard for the future. The rivalry has a bad and not a good effect on both exhibitions, and leads to the lowering of public taste by hanging many works that are not worth the honour.

A NEW WORK ON TESTING.

IT is a long time since so remarkable a contribution has been made to engineering literature as Mr. W. G. Kirkaldy's book on "The Strength and Properties of Materials." It is remarkable because while it contains so much that is useful and instructive, the information is unfortunately so much combined with purely personal considerations. It is to be very much regretted that the author should have thought that this was a fitting opportunity to ventilate what he and his father consider grievances, for in so doing he has detracted very seriously from the value of his work. Wherever it is possible to do so, the author refers to the complete and conscientious manner in which work entrusted to his firm is carried out, and and he evidently considers it necessary to take every opportunity to direct the reader's attention to the fact that "there has never been any shirking of the work under the plea of being tedious and guessing the amount, as appears, most unfortunately, to be far too frequently done elsewhere." In describing his own work, the author says, "Such a collection of original data is practically unique,—certainly very different from the usual style of others, when compiling books upon the 'Strength of Materials,'" and many similar pharisaical expressions are to be found throughout the book. We are told so much about the faithful discharge of professional duties, and Mr. Kirkaldy's considerations of his moral procedure, that we feel somewhat relieved when the author informs us that on one occasion his father "overruled his feelings of delicacy," because this seems to indicate that at one time such feelings actually existed, although it is a source of regret that they were not hereditary.

The chief grievance complained of appears to us to be stated by the author in the following words:—"It undoubtedly has been, and remains still, a disappointment to Kirkaldy that his services have never been acknowledged in any form; he was the last to expect a monetary reward, but certainly had hoped that his further researches would have been promoted by the many who benefited so enormously by his labours." It could hardly be expected in a book of this description that professors of engineering would escape notice, and the author seems to anticipate "a general conversion of technical laboratories from purely educational uses, into establishments where outside work is undertaken and charged for." We think many will agree that professors of engineering are not the best persons for making such tests as are required in every-day practice, and that it would be better if they did not undertake such work.

The author objects, and we think not without cause, to the way in which some engineers specify that tests are to be made "by Kirkaldy or by ——," inserting an additional name, and there can be no doubt that it would be better to decide in the first instance who is to make the tests, and not leave it optional to the contractor, who very possibly will get the work done in the cheapest manner.

Our space will not permit us to consider other injuries of which the author complains. We are very willing to acknowledge that Mr. Kirkaldy has done much useful work during his lifetime, but it must not be forgotten that his operations have been carried on as a commercial undertaking, and judging from appearances with financial success, and in our opinion the author's tedious account of what he considers his father's grievances is as uncalled for as the references to his abilities as an experimenter.

We now come to the technical portion of the book, which it is hardly necessary to say is most instructive, since it represents the chief results arrived at by Mr. David Kirkaldy during a quarter of a century. The records of about 12,000 different tests are given in a series of fifty-two reports, printed and arranged in an admirable manner; indeed, it would be almost impossible to speak too highly of this portion of the work. In addition to the reports there are twenty-five plates, giving drawings of the specimens tested, and other information. If we were to attempt to notice the chief points of interest to be found in this part of the book we should have to go systematically through the whole of the reports, but we must content ourselves by mentioning only a few of them. A test described by the author on page 12 has a particular interest just at the present time owing to the collapsing of the railway-bridge on the Brighton line at Norwood Junction. Mr. Kirkaldy tested specimens cut from a cast-iron girder which had been subjected to railway traffic for thirty-three years, and the results obtained proved that in this instance, at least, the metal had undergone no change during the long period the bridge had been in use. A similar series of tests were carried out at the author's works upon rivetted wrought-iron girders taken from a railway-bridge at Willesden Junction, London and North-Western Railway. The results of the several tests are very fully given in two detailed reports, and it appears that although trains had been running over this bridge for twenty years no change could be detected in the iron by any of the tests, and that it had not changed from the fibrous to the crystalline state.

A very complete series of experiments on steel rails is given, showing their strength under bending stresses, as well as under ordinary tension, and the tests made and recorded on the full-size links of the Albert and New Hammersmith bridges are also most instructive. The specimens taken from thirteen rolled joists supplied by Messrs. Dorman, Long, & Co., show a very high quality of material, the average strength being 28 tons per square inch, with an ultimate extension of nearly 29 per cent. in 10 in. The report giving the result of many tests on ordinary timber will be found useful, as it gives the strength of several large specimens under both bending and compressive stresses.

At the end of the work the author has added an historical sketch, giving an outline life of his father, and dealing at some length with his professional career, but the chief value of the book is to be found in the fine collection of experiments above referred to, which will be of great interest both to architects and engineers.

NOTES.

WE regret to hear that, up to the time of our going to press on Thursday afternoon, there is no prospect of averting the threatened lock-out of carpenters and joiners in London. The following circular was issued to its members by the Central Association of Master Builders on Thursday:—

"31, Bedford-street, Strand, W.C.,
London, May 21, 1891.

SIR,—I am desired by the Committee to say that as the firms struck against have not been able to meet their requirements, it will be necessary to carry out the resolution come to at the meeting on May 11 last, and close all shops and jobs to carpenters and joiners on Saturday, the 23rd inst.

Kindly let me hear on Monday how many men in your employ this notice has affected.

The Committee also desire me most earnestly to impress upon you the extreme importance of united action in this matter.

I am, sir, yours truly,
E. S. HENSHAW, Secretary."

We trust that, even at the last moment, counsels of moderation and conciliation may prevail.

AT the last sitting of the House of Commons Standing Committee on Law, Mr. Ritchie (President of the Local Government Board) explained that Clause 34 of the new Public Health Bill, which was then under consideration, would apply not only to underground rooms or dwellings to be built in the future, but to those now existing. He pointed out that under the present law in London, basement dwellings need not be more than 1 ft. above the ground, but in the provinces every room built previous to 1875, was required to be at least 3 ft. above the ground, and the Act of that year entirely prohibited the occupation as a dwelling of any room not completely above ground. In the metropolis, he further explained, there was a very great amount of unhealthiness in connexion with such underground abodes, and clause 34 as it stood provided that any room not let separately as a dwelling before the passing of the Bill should not be let or occupied unless it was 7 ft. high from floor to ceiling, was at least 3 ft. above the ground, and had in the front an area of 4 ft. in width. With respect to existing underground dwellings, to meet certain objections to the original clauses, Mr. Ritchie proposed modifications giving to the Sanitary Authority instead of to the County Council the power of granting exemptions, and to any person to whom an exemption was refused, a right of appeal to the Local Government Board. He also proposed to modify the clause so as to provide that any room not let or occupied before the passing of the Bill might be less than 3 ft., but not less than 1 ft. above the ground, if the width of the front area was equal to the depth of the room below the surface. With these, and some minor amendments, the clause was agreed to.

THE Board of Trade railway rate proposals are remaining but little affected by the inquiry before the Parliamentary Committee, most of the amendments introduced last week being, as before, overruled. The first question dealt with after the ten days' adjournment caused by the prevailing epidemic was the charge for fractions. The original demand of the railway companies was for fractions of a quarter of a ton to be charged for as a quarter of a ton. The revised schedule only authorises them to charge for quarters of *cwts.* as quarters of cwts., except in the case of consignments weighing over five tons, in which case the original proposal is adopted. In spite of this great difference, the traders' representatives asked for a further reduction, the effect of which would be to charge for each 14 lbs. instead of each 28 lbs. The traders are not really so insatiable as this request would appear to indicate, inasmuch as it embodies the system which has been in practise for the past ten or twelve years. The amendment was, however, rejected. The clause relating to empties,—which, it may be remembered, we characterised as most peculiar,—was admitted by Mr. Courtenay Boyle to be one which the Board felt a difficulty in defending; as, although the drafting of the clause had occupied them a considerable time, it hardly effected what they desired. As it stood, much elaborate calculation would be required in every case in order to get at the sum actually authorised; and the subject presented so much difficulty to the Committee that the consideration of it had to be deferred. Finally, a scale of charges for empties was adopted, commencing at 3d. per cwt. for distances below twenty-five miles. This is a great concession, the existing scale being considerably higher, and to firms who deal with returned packages on a large scale it will make a considerable difference.

ON Saturday last the so-called "international" Electro-technical Exhibition was opened at Frankfort-on-the-Main, in presence of the Dowager Empress Frederick and her court, the former Mayor of the city, now Prussian Minister of Finance, reading the address. The exhibition, which is expected to prove a great success, was, however, by no means ready on the opening day, and is scarcely likely to be so for six weeks hence. We may refer to those parts of the exhibition which directly or indirectly pertain to architecture or the building trades at a later date. For the present we will only mention that the idea of having this exhibition originated with the Frankfort Electro-technical Society, at a general meeting in November, 1889, in which

err Sonnemann made some propositions in e form of a preliminary programme. This ogramme was adopted and kept to in most ants, a Committee elected, and placed under e presidency of Herr Sonnemann, Herr Oscar n Miller being appointed as Vice-President d Technical Manager. The honorary pre- ency was accepted by the former Mayor, '. Miguel, now Minister of Finance; and e distinguished electricians, Werner von emens (Germany), Von Waltenhofen ustria), Marcel Deprez (France), S. P. ompson (England), and Edison (America), nsented to act as honorary members and visers. The usual system of awarding plomas will not be adopted at this exhi- ion. A special body of examiners, elected rtly by the Managing Committee and partly nt by the Government, divided into eight ctions, according to the subjects, will, how- er, act as a jury on the exhibits, and will ve the duty of making a full report on ery exhibit in the grounds, thus compiling a blication which is likely to contain some luable information.

WHILE the general characteristics of [Oxford remain the same, continual anges are taking place in particular details. nite recently the ceiling of the hall of ncoln College was removed and the roof storied. During the coming Long Vacation, understand that the present windows of e hall are to be removed and Gothic ones bstituted for them. The existing windows e comparatively modern, with square heads, d it is intended that the new ones shall be nilar to those which from old drawings ere either actually in the building or in- nded to be there. The work is to be done der the direction of Mr. T. G. Jackson, d it is, we believe, owing to the patriotism former members of the College that funds r the purpose have been forthcoming.

THE Central Direction of the Prussian Archæological Institute have wisely cided on a formal change in the issue of the ntiken Denkmäler, to which we have so ten had occasion to refer. It is to retain s present form of five numbers, with twelve ates each, making up the single volume, but no longer to be a yearly publication. his seems very wise in the case of a work hich consists mainly of magnificent plates hich require extraordinary care in their re- oduction. Moreover, nothing is more resome than the habit, grown with most chæological periodicals to a confirmed ce, of never being "up to date." he numbers will now be issued when ey are ready, and, according to the ressure of archæological material. The ntents of the present number are various d valuable. We have full-sized plates to ustrate Dr. Sauer's article on the Parthenon ediments, to which we drew attention last eek, and some very careful sketches of the agments of sculpture still actually *in situ* ill interest archæologists. Plate 51 is evoted to a plan of the newly-discovered mples at Locri (in Calabria). The ground- an of the two successive temples is clearly ade out, and even in structure of the naller and older temple two periods of ilding are differentiated. To architecture so is devoted plate 50, which gives beauti- l coloured facsimiles of portions of archaic arble cornices. In the department of culpture we have a very fine reproduction the much-discussed archaic statue, attri- uted by some to Antenor. Its relation to ie inscribed basis is dealt with afresh, but e are glad to note that the uncertainty of ie relation (pointed out by the Director of ie English School at Athens) is now frankly dmitted. From the Locri temple we have late 52) a very remarkable fragment of a culptured group, a horse and horseman, the orse supported on the figure of a sea onster. It is conjectured that this may present one of the Dioscuri coming over ie sea from Sparta to the assistance of the nhabitants of Locri.

A VERY interesting paper by Mr. R. H. Thurston on the "Permanent Effect of Strain in Metals," and a good discussion on the subject, is to be found in the *Transactions of the American Society of Engineers* for March. The author points out that if a metal is subjected to a stress of any given kind sufficient to produce a permanent strain and set, then its ultimate resistance to that or any other kind of stress will be sensibly increased, and in all directions. This fact, of course, has been long known, but it has never been illustrated by such conclusive experiments as described by Mr. Thurston. Much was said during the discussion about using iron in structures after it had been stressed up to its elastic limit, and it was generally admitted that no injury was done to the metal so strained. In England there are many engineers who, if they knew it, would reject iron or steel so stressed, overlooking the fact that plates and bars have to be "cold-straightened" before they can be used for structural purposes, which process is nothing more than stressing the metal beyond its elastic limit. Mr. D. J. Whittemore stated that when renewing some railway bridges, he had felt perfectly safe in taking some of the ties, which had stretched several inches, from the old bridges and using them again in the new bridges, although with a moderate stress. In connexion with this subject, we think the suspension-links of the former Hammersmith Bridge teach us an important lesson. These links, which had, no doubt, been overloaded in their original positions, were used for temporary purposes during the erection of the Forth Bridge, and some were found to be so brittle that they not only broke under a very low stress, but while being simply handled, so that it was considered necessary to anneal the remainder before making use of them. In the same volume Mr. R. L. Harris describes how he constructed a coffer-dam or caisson without the use of timber or iron. Having occasion to build upon an existing masonry pier situated in some 28 ft. of water, he succeeded, by grouting, not only in rendering the sides of the pier water-tight for a depth of some 6 ft. below the water-line, but in making at this level a water-tight floor also, so that the interior of the pier, which was of very inferior quality, could be removed and the new work built in its place.

THE site of Nos. 8 and 9, Soho-square, upon the northern side, will shortly be cleared for the erection of the new Eglise Réformée (Huguenote) Française de Londres, after the designs of Mr. Aston Webb. This will replace the church in St. Martin's-le-Grand, which Owen designed in the Gothic style, and which was consecrated by the late Pasteur G. G. Daugars. Having been finally closed on May 29, 1887, it was shortly afterwards pulled down, together with Angel- and Bull-and-Mouth streets, the "Queen's Hotel," and other premises, for the Post Office extension buildings. What, we are informed, are known as the Nonconformist congregation, who now occupy Soho Chapel, 73, Oxford-street, for temporary purposes, had migrated to St. Martin's-le-Grand upon the demolition of their church, St. Mary's, in Threadneedle-street. That church stood upon the site of the old St. Anthony's Hospital and School,—an important school in its day, and the place of education of Whitgift and Sir Thomas More. St. Anthony's Hospital was suppressed *temp.* Edward VI., who gave to this community of the earlier Huguenots a charter, dated July 24, 1550, and established them in close proximity to Austin Friars, which had been assigned in that same year to the Dutch refugees for a place of worship, as the king's own diary records. Foreign Protestants had many churches in Soho and its immediate neighbourhood; among the more important of these were "Le Temple," originally in Berwick-street (1689), and since in Wardour-street; "La Charenton," by Newport Market; the chapels in Leicester-fields and Glasshouse-street, Golden-square; "Les Grecs" in Hog-lane (Crown-street), the scene of Hogarth's painting, "Noon"; and the Swiss Chapel in Moor-street, the site of the old French Exchange. Moreover, a colony of Dutch, German, French, and Scotch workmen settled at St. Martin's-le-Grand as early as Queen Elizabeth's reign, and it is said that there, within the sanctuary limits, some silk-throwsters from Flanders found their first abiding-place in London.

AS the question of street accidents in London is occupying the attention of the authorities, it would be well that some measure were considered whereby the street "refuges," which ought to be multiplied, should not, as is often the case, be made, as it were, traps for the unwary. In some thoroughfares where a policeman is not on duty vehicles pass on the wrong side. The foot passenger, who is naturally looking towards the side from which carriages ought to come, may thus meet with an accident by trusting too much to the very refuge which was erected for his safety. The fact is that severe penalties ought to be placed on these offences. It is useless for the authorities to make constructive improvements in the streets if the benefit which may be obtained from them is nullified by the culpability of drivers of vehicles.

THE southern and western blocks of the old parochial almshouses for St. Martin's-in-the-Fields, in Chapel-place, Charing Cross-road, have been pulled down. Formerly known as the Hog-lane almshouses, these are stated by some writers to have been founded by Nell Gwynne,—we know not upon what authority, nor is her name cited in the several inscriptions that were set up there, and which Hatton quotes in his "New View of London," 1708. The almshouses, consisting of six separate endowments, and since standing within St. Anne's parish, formed an entire quadrangle around an area in which stood the Greek church, consecrated in 1677, and latterly known as St. Mary the Virgin, Soho. Nell Gwynne died in 1687. The founders' names (where given) and the dates of the buildings are as follow:—East side, since removed: by Mrs. Grimes, or perhaps Graham, for four unmarried women and their servant, built and endowed in 1686. South side: Ten houses by Peter Griffith, George Giles, and the parish Vestry,—in 1683. West side: Four houses, with money committed to Dr. Tenison, the then vicar, "by persons who desire to have their names concealed,"—in 1680. North side (site of the Board schools): One house inscribed thus: "This Alms-house, Numb. 13, was built Anno 1684 at the Charge of one of his Majesty's Justices of the Peace and an Inhabitant of St. Martins in the Fields," reputedly, says Hatton, one Captain Dewy; three houses by the private charity of divers parishioners,—in 1685; and two more, built and endowed by Sir Charles Coterel, Master of the Ceremonies to Kings Charles II. and James II. During the period 1680-7. Nell Gwynne was living in Pall-mall, in St. James, Westminster, parish, as taken out of St. Martin's in 1684; so, if she did give any money to these charities, she must have done so for the west group of four houses in 1680, and anonymously. St. Anne's, Soho, was taken out of St. Martin's parish in 1686. A recent addition to the eastern end of the old Greek church was made by, we are told, Mr. W. Slater and Mr. R. H. Carpenter, architects. A water-colour view of the almshouses by T. Hosmer Shepherd, painted in 1854, is in the Crace Collection, British Museum.

IT would be curious if one could know the influences under which some of the letters printed in the *Times* get acceptance in that journal. On Monday, for instance, we find a letter protesting against the application of Board of Trade rules to a new little line of railway in Wales, in which we presume

the writer is a shareholder. This gentleman observes that:—

"On the Western American roads crack trains like the "Fast Flying Virginian," the "Overland Flyer," the "Nellie Bly," or the "Pacific Cannon Ball,"—I am not defending their titles,—make their thirty or forty miles an hour every day in perfect safety without a single Board of Trade appliance (except the necessary one, in an unfenced country, of a good continuous brake), and this over single lines whose construction would turn an English railroad man's hair grey with terror."

Do they do it in perfect safety *every* day? If so, then how is it we get such frequent reports of terrible railway accidents in America, from the overturning of trains and the breaking of insufficient bridges? It is true, unfortunately, as we had occasion to point out in a review of a book on American railroads a little while since, that the American engineers by their own admission frequently make roads and bridges in so haphazard a manner as almost to prepare for accidents. We have hitherto been above this in England, but a shareholder can apparently get the use of the *Times* for the purpose of recommending that the same course should be adopted on English railways, and the lives of passengers endangered to save his money.

THE death of Mr. Thomas Collier, announced in another column, will be a great loss to the Institute of Painters in Water-Colours as well as to the world of art generally. For a long time he was almost the only member of the Institute of Water-Colours who upheld the dignity of the old school of broad and freely-handled painting in pure water-colour, without body colour, of which David Cox was the acknowledged head. Mr. Collier's drawings had a certain resemblance to Cox's in style, especially in his treatment of the sky. For many years his drawings formed central objects at the Institute Exhibitions, and were among the things we always looked for first in visiting the Exhibition. They will leave a gap on the walls not easy to fill up.

WE quoted last week some remarks from a French paper (the *Courrier de l'Art*) in regard to the opening of museums on Sunday in England, and the satisfactory results in regard to the Sheffield Museum, as compared with the system of closed doors in London museums. A further comment on the subject is suggested by the course which is taken at the Paris Salon. A visitor to the Champs Elysées last Sunday afternoon would have seen, as he approached the Palais d'Industrie, two long lines of people, four or five deep, extending on each side from the central door of the Exhibition, waiting quietly for their turn for entrance, while the turnstiles at the door kept up an unceasing "crick, crick," like a sewing-machine at work. These people were not only allowed to enter a picture gallery on Sunday, but were admitted *free*, the Salon on Sunday after mid-day being open for any person in the street to turn in who likes. The crowd inside was naturally very great, but perfectly orderly and well-behaved, and apparently much interested in the pictures. As to the religious question, all these people might, if they wished, have been to church in the morning, but in the afternoon they can go to the Exhibition instead of being left to their own resources for finding entertainment. Surely the contrast between London and Paris in this respect is worth serious consideration.

APPOINTMENT.—At a meeting of the Corporate Property Committee of the Leeds County Council, held on the 15th inst., Alderman Baker presiding, Mr. J. T. Irvine, who has had charge of the work that has been carried out during the last few years at Peterborough Cathedral, was appointed clerk of the works at Kirkstall Abbey, where considerable alterations are shortly to be made in the way of strengthening walls and so on. Mr. Irvine will work under the direction of Mr. Micklethwaite, architect, of London.

STAINED GLASS.*

THE keynote of this window is the dignity to which our human nature has been raised by its being adopted rather than any other nature by Christ, and His choosing to be "born of a woman." I have, therefore,† placed the Virgin and Child central between the two great Archangels and a little raised above them, whilst below the three is the Dragon enemy, with his head beneath the foot of the "Woman's Seed," to whom Michael points as the source of the power by which he has struck him to the ground: "*The Lord* rebuke thee." To strike another note in contrast, I have placed in the two side-lights our nature in its fall,—Adam and Eve. These lights I have kept darker in tone in order to throw into prominence an arrangement suggested to me by hearing of the patron's wish, rather late in the day, that the events of the Virgin's life should also be introduced. I have separated the colour-scheme of the window into two parts, and treated the three central lights and the tracery above as a canopied shrine containing the three great figures, and into the architectural part have introduced, in the form of sculpture, intended to have the appearance of relievos in silver, the incidents of the life: in the base of the central light the Annunciation; in its canopy the Visitation to St. Elisabeth; in the four canopies of the tracery above, the Nativity, Presentation in the Temple, Mary at the foot of the Cross, and Mary in the house of St. John, *spinning*, to draw a comparison with Eve in the lancet below, our common lot of labour and its dignity. The canopy ends in an architectural crown, the crown of our human nature and the Virgin's life; she is received into Heaven by her Divine Son.

But you may well imagine that the influence of love upon one's work does not end with the projecting of it, but models and informs it at every step through all the doing of it, and I have, therefore, reserved till now a description of several methods which do not form part of the ordinary practice of stained glass-work.

First, I may refer to the subject of working from the life. That, however, *is* becoming the practice now, for a good reason, that the public will no longer stand the crude angular horrors of the Early Gothic revival. I may pass over the subject lightly with the remark that, of course, the practice ought to be universal and constant. The Almighty expects us to study His works and to learn them, and never to think in our conceit that we have sounded the whole depth of their beauty, and that for the future we are chartered preachers of it to the crowd of outer Philistines, and can serve it up to them re-cooked in our own dull brain. There is an idea abroad that our business as artists is to teach. It may possibly be so; I do not feel it very forcibly, but I beg to record my entirely positive conviction that our never-ceasing business is to *learn*. Now, take this figure of St. Michael. I made five studies of the nude figure from two different models before I could please myself. I got them enlarged to the full size, and then had the model again, and drew a complete life-size study of the figure; but that was only the beginning. What to do for armour? Well, the practice is, of course, to borrow it out of costume-books, or hire a suit of old armour. But I have always found that all fancy and beauty in design, all the essence of a thing, comes to one only in the course of actual construction,—we must handle with our own hand. Now, as the forging of armour is a lost art, and of course was out of the question, I had to do the best I could, and for days and weeks both I and my assistant devoted ourselves to making a suit of armour with layers of paper, pasted one over the other to the thickness of a crown piece, using the actual limb as the block to mould it on. Of course, the general principles of construction were studied from actual armour; but you can have no conception what a light such a practice throws upon the questions of what is possible, what is wearable, and therefore of what is useful and beautiful. In moulding the joints for the elbow, knee, or shoulder, moving the limb constantly, of course, you see, in a way that no study of books could tell you, what forms must be adopted to defend the joint in all its actions, and what curves must be used to turn aside the most probable blow or thrust; in short, by the time we had made it, we knew how to wear it, and did not feel like "hogs in armour." I have brought you, as an example, the helmet we put together, and I beg to tell you it was difficult enough to draw its subtle curves when made, and to have invented them out of one's own head would have been simply impossible.

The next practice I have to allude to as reasonable, and to deplore as rare, is that the artist should himself paint on the glass. Here is the same figure finished and ready to be put into the lead. Every bit of that glass has passed through my hands at least five times, every bit has been painted under my own supervision, and touched by myself at all stages wherever touching was necessary.

I will now illustrate a third practice by a reference to the same panel. Does it not strike you that the upper part of the figure is, for some reason, less agreeable to the eye than the lower? You may have noticed it without detecting the reason. I will point it out. As far as here you see I have put opaque lines at the back of the plate to represent the lead lines as they will appear in the window. You would think that everyone *must* paint so; that it would be impossible to paint surrounded by lines of glittering light (the sky seen through the interstices) pieces of glass ultimately intended to be seen surrounded by dark (the black of the lead line). Strange to say, whenever this obviously reasonable proceeding has come under the notice of my glass-painting friends, they say they "should think it must be rather a good dodge." What can I reply but that I should think so too?

Then, again, I constantly see windows intended to go 20 ft., 30 ft., 40 ft., or more from the eye being carried out and painted to their ultimate finish, without ever going more than 3 ft., 4 ft., or 5 ft. from it. I have knocked out a door in the extreme gable point of my studio, up to which, sometimes a dozen times a day, with ropes and pulleys, I slung the easel, which weighs over a hundredweight, and if I did not do this I simply could not paint at all.

But the practice of all others which I should have thought could not be dispensed with by any one, and is dispensed with, as far as I know, by every one, is that of choosing the glass by a sketch made *in glass*, not by a sketch made on paper. The ordinary practice is to make a water-colour sketch, and then on the cartoon to write the numbers which correspond with those by which the various coloured glasses are known to the cutters in the cutting-room. Now, to me this is just as if Titian or Veronese had designed their pictures in one room, and handed over their palette to an assistant in another room, merely numbering a cartoon in spaces, "Venetian red," "ultramarine," "yellow ochre," and leaving it to chance how the colours looked when they came together. Here is the kind of sketch in glass by which I think they should be chosen, but not content with that, I go to the racks in the cutting-room and pick the pieces out of the sheets myself, to make sure of having the right depth of tone, and to avail myself of accidental qualities in the glass, which often occur, and are often beautiful.

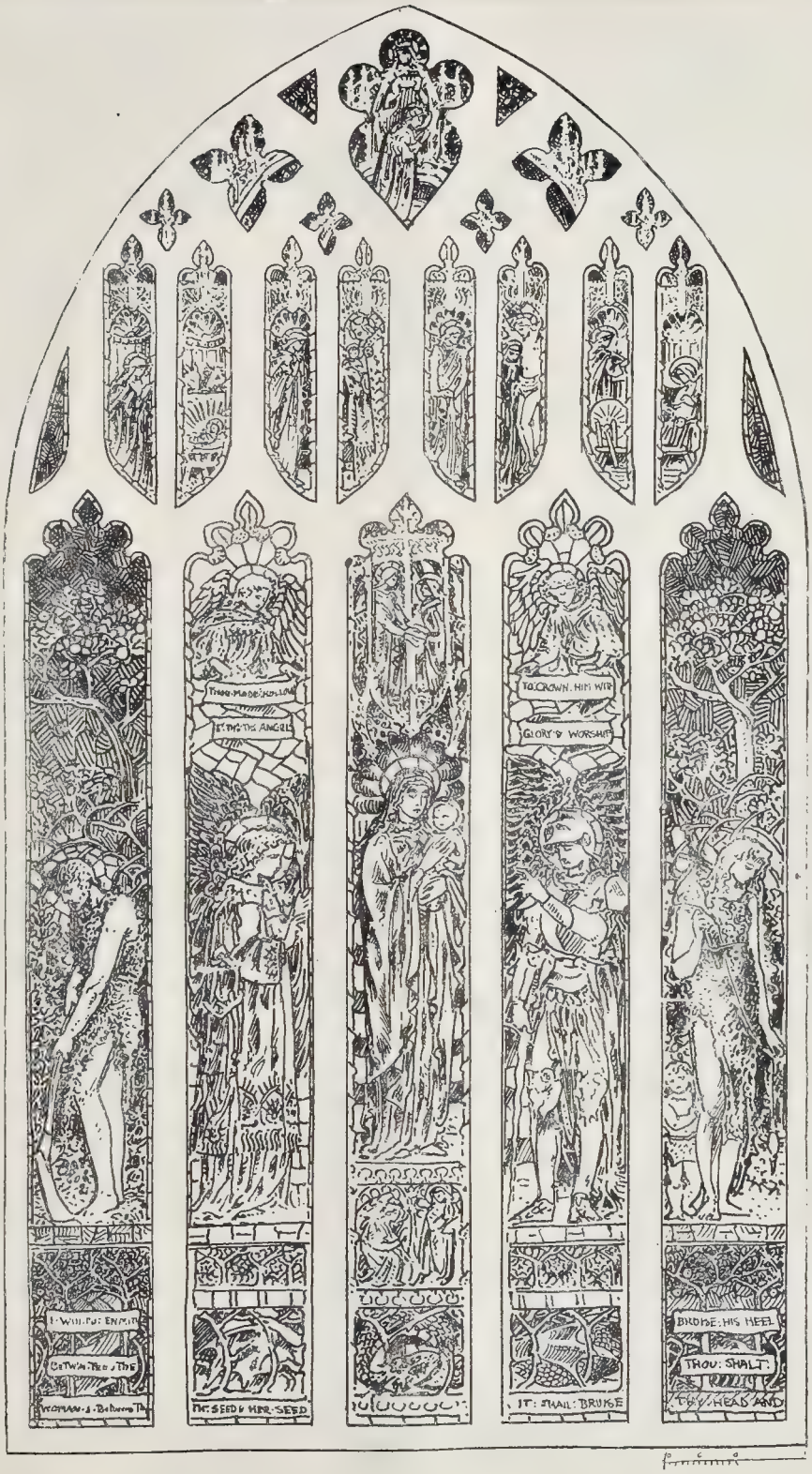
Well, here are the results of all these processes. Of course, I do not claim to have achieved much by them,—pains and care are not genius,—but at least I may claim to have tried, and no amount of genius will cover the loss of one iota of possible pains and care, for all that is possible in these is also necessary. However, it is painful and uncongenial to me to dwell on this contrast between what is and what should be, and I should not do it at all if no useful end could be served by it. But you may some day chance to be placed in the position of patrons or members of some committee, by whose judgment a piece of art patronage will be distributed: I have, therefore, endeavoured to show you what stained glass is, and should be, in order to direct your judgment; but I will try and bring the thing closer home to you.

You have seen somewhere a window that pleases you, and you wish one erected by the

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* A paper read before the Liverpool Art Club, on February 2, by Mr. C. W. Whall. Continued from page 391.

† See sketch of window herewith, and also one of our ink-photo plates for two of the figures on an enlarged scale. As was mentioned by us a fortnight ago, the window has been painted by Mr. Whall's assistant, under his own supervision, and direct from his life studies and the whole retouched by himself. The colour has been arranged by sketches made previously on the actual glass. Reference was made in the lecture to two other window designs by Mr. Whall, which were also exhibited, but as we have no illustrations of these we omit the references to them, which would hardly be intelligible apart from the drawings.



Window for the Church of St. Mary, Stamford — Designed by Mr. C. W. Whall.

same hand. But you are modest, and, distrusting your own judgment, you wish to know whether it is really good. First, then, go and examine the workmanship, for no artistic quality can lessen the importance of that. See that rounded leads have been used, and not flat ones; see that wide leads have been used, and not narrow one. Go at night into the church and look at the painted surface of the glass, which, of course, is not visible with daylight shining through it; examine it by gas or candle; see if any of it looks rusty; if it does, take a pen-knife (pacifying the parson with the assurance that you act in the interests of art!) and scrape at it as hard as you can scrape. Go again by day and examine the parts scraped; and if you can see daylight through the scratches, remember that the glass is badly fired, and that in course of time it will all vanish away.

Having satisfied yourself that the workmanship is good, you will want to criticise the poetic fancy, the meaning of the work. Well, of course, we are all judges of *that!* No canons of taste can be laid down; *De gustibus non disputandum.* But there are certain landmarks possible even here.

First, see that the work is original; because, if a man is content to spend his life repeating his old efforts and rearranging his old sermons, he is no poet or teacher.

Second, see that the work is devoted, *Know your man*, and know that he has the enthusiasm and self-sacrifice of an artist.

And when I say, "Know your man," I mean don't be so foolish as, seeing a window that you like, and wanting one by the same hand, to think that you will necessarily get it by ordering it of the same firm. Go to the same firm, if you like, but see that they employ the same man. It amazes me to see how men and women of culture will act as members of a committee and order a piece of decorative art out of what is to all intents and purposes a shop, without taking the least thought of becoming acquainted with, or even knowing the name of, the artist who is to design it. As if it didn't matter!

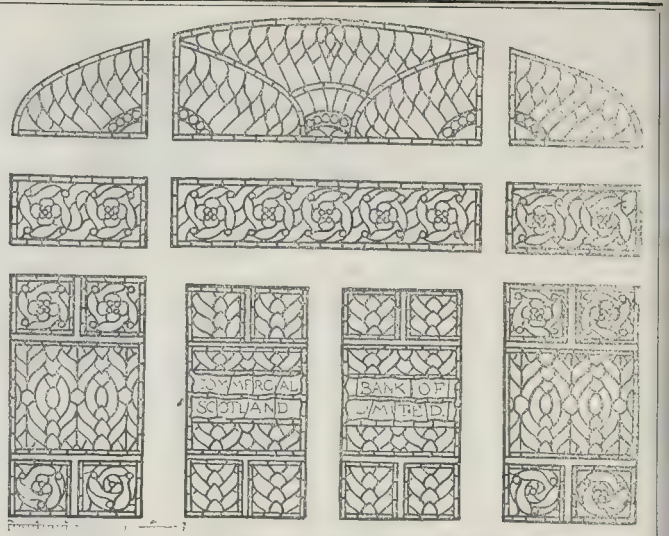
"We have got a splendid idea for our window; it is to be the Last Judgment and the final triumph of Good over Evil. There will be the seven heavens and the nine choirs of angels, the Glorious Company of the Apostles, the Goodly Fellowship of the Prophets, and the noble Army of Martyrs." "Oh, how nice! And who is going to do it?" "Messrs. Brown, Jones, and Robinson." "But who designs it?" "Oh, well, I suppose one of their young men will design it; of course, we leave that to them." So, if you want an ode written you will leave it to Messrs. Chapman and Hall, instead of finding your poet; if you want a sonata or a mass, you will deposit the order on the counter at Novello's, and leave them to choose the musician? And would you not then deserve to get what you do get by ordering works of art in this way; the thoughts of old poets and musicians,—in a word, of artists, of the past,—copied, adapted, patched together, and then used over and over again till the very cartoons are worn out in passing through the shops?

Having got your man, see that he is given proper conditions to work under. These are only two; take care that he have

(1.) Sufficient pay.
(2.) Sufficient time.

Now I need not enter into details as to these, but I will suggest one simple means by which they can be secured.

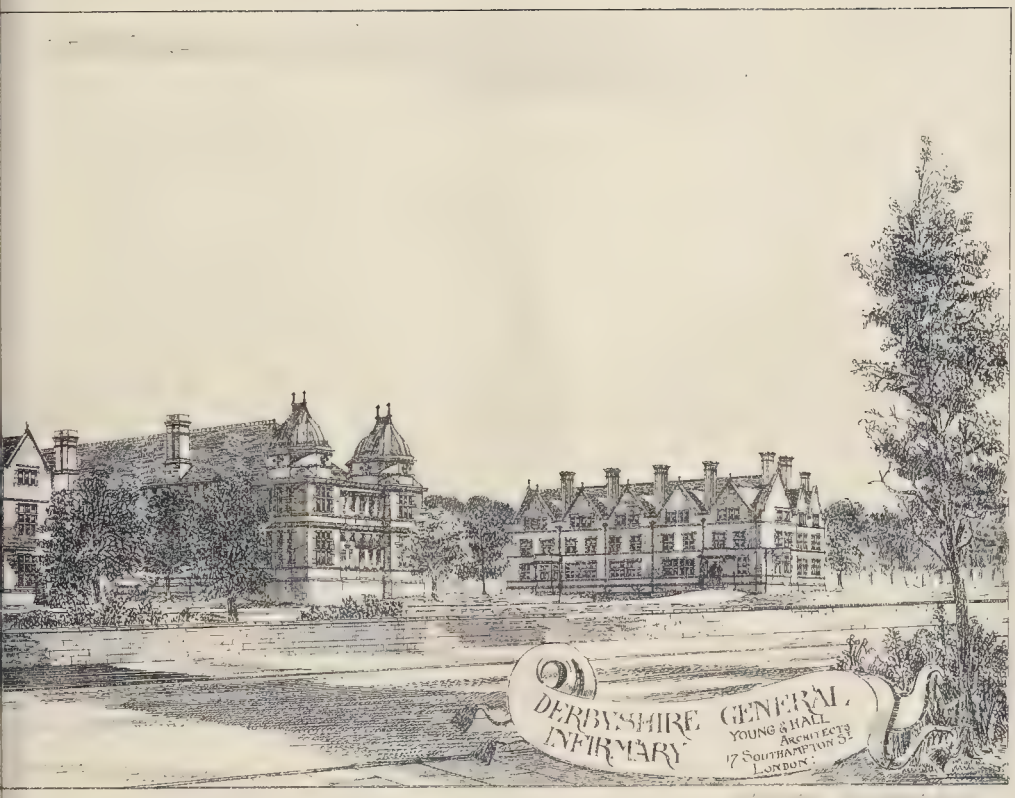
Meet your man. Talk the thing over with him. Show him what the idea is and what the church is, and tell him what you can afford. If he is an artist and a man of honourable feeling he will tell you what can be done and what is fair and reasonable, and you need never fear that he will give you less than your money's worth; it is a hundred chances to one that he will try to give you more. If the sum is not large enough to cover the cost of elaborate figure-work well done, he will make no unreasonable attempt to meet an unreasonable wish on the subject by undertaking to do elaborate figure-work with the hope of passing off such upon you *ill* done. He will suggest some less ambitious scheme which may be just as beautiful of its kind, and, perhaps, even much more suitable to the church in every way. And with regard to the question of sufficient time, which is of much more importance to him than sufficient pay; you may remember that, reasonable diligence on his part being always secured to you by the fact that he will be wanting to get paid, your giving him an interview will allow him the chance of persuading you out of the extreme folly you were contemplating, of hurrying on the work (to its certain ruin) in order to be in time for the Archdeacon's visitation. But in addition to these means of protecting yourself from a mistake, there is one that may often help you. Consult an architect. If the church is new, and the architect of it living, I will go so far as to say that it is your duty to do so: the church is his, and he has a right to be asked about its decoration. But if not, go to some one whom you know to be an artist in his own work, one who loves to build beautiful things. Ask his advice, he will quite probably be able, and certainly willing, to direct you into the right way of setting about it. If all these means fail you, I would say, by way of summing up my advice, "Don't give stained-glass at all. Leave the light of heaven to come in through the plain diamond panes, and put your money into some more utilitarian and less ambitious form of charity: for after all, if I were only allowed to speak one sentence to you to-night upon the subject of stained-glass, I should have no hesitation in choosing what to say. The sentence would run thus: "There's far too much of it!" Church after church is ruined by ambitious attempts to do, by the aid of ordinary people, a supremely difficult thing which can only be well done by its coming under the grasp of genius and enthusiasm. But without straining after so high a flight, much that is beautiful may be done. Good ornament is quite attainable even in these days; and let me even dwell for a moment on the very great beauty of good plain glazing; for the ordinary leadwork of a window, well arranged by a good architect or master of ornament, and containing beautiful material, may have a most charming effect. Certainly the one piece of work which I have myself most enjoyed this year (and all that I show you to-night was done within that period) was this plain glazing for the interior of a bank, where my only source of beauty lay in my making a kind of lacework of the lead, filling it in with various pale tints of this exquisite glass, the existence of which we owe (and it is a real debt) to the enthusiasm and persistence of an architect, Mr. E. S. Prior. I have not seen this particular piece of work *in situ;* it is as far off as Glasgow; but to show you the value of such work well done I may mention that though this is the kind of job that architects sometimes treat as so insignificant that they leave it to the builder to estimate what he likes for it, this particular piece of work, humble as it is, so pleased the architect that he thought it worth his while to write me the warmest letter of commendation and thanks that I have ever received from any one regarding a piece of my work. I am far from sure that my ambitious figure window will give so much or so wholesome pleasure, or do so much good during the thousand years or more that, if left alone, they are each of them well calculated to last.



Leaded Glass Work at the Commercial Bank of Scotland, Glasgow.—Designed by Mr. C. W. Whall.

And now I must draw my remarks towards a close. I fear you will think that in dealing with my subject I have not adopted a very hopeful tone, or painted a very flourishing picture. To do the latter would have been untruthful; but I am very hopeful, and I propose to devote a very few minutes to forecasting what I think may be the future of the Decorative Arts. I said that the Gothic revival was founded on old models, past centuries; but I did not say which centuries. Briefly, then, the thirteenth and fourteenth. This was no doubt largely owing to the teaching of Ruskin, and to the picturesque historic glamour which hangs over those early days. But as far as the architectural arts are concerned, the exaggerated views of the early leaders were seen to be too narrow. Men rebelled against being forced back to live the thirteenth century over again, with all its limitations; the beauties of the later work, of the Perpendicular, even of the "Queen Anne" and others, were reasserted (by no one more generously than by Ruskin himself); whilst men like Bodley and Norman Shaw, Gilbert Scott, jun., and Bentley, Jackson, Champneys, and Sedding working in them, broke the spell, and shattered the old restricted movement to pieces. What I have called the "crude, angular horrors" of the days of Pugin would no longer pass current, and more strenuous efforts had to be made to conquer the difficulties of art as art, and to bring *it*,—and not mere good intentions,—into harmony with the craving after the old religious and poetic spirit of the past. This movement has led men, by strong reaction, back to Classic architecture. I deeply regret that; the return to one century is as artificial as the return to the other. It falls under the same reproach which I have alluded to as the cause of all the failure, for it also says, "What has been shall again be, and all will be well;" but it has served the good end of demonstrating that all attempts to revive the dead past are exhumation, not Renaissance; and while doing this the movement (and this is an advance upon the Gothic movement) is now having a curious but very, very encouraging result. By setting up the standard of perfection in art as art, it is, in painfully following after this excellence, giving the arts of architecture, sculpture, and painting respect for and sympathy with each other, and the men who practise them are drawing together by the single tie and meeting together on the single basis of fine craftsmanship as such, and are setting themselves to school to learn of each other, and to respect the difficulties and limitations of each others' calling, in associations of "Art and Craft." At present it is a movement chiefly amongst younger men, but it is growing and spreading,




DERBYSHIRE GENERAL INFIRMARY
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believe that the future is in its hands. I ot go deeper or travel beyond the arts which it is my business to speak to you, hink I may tell you this much,—though, , you would guess it for yourselves, that men, besides being artists, having, as they such open minds that they are searching truth, are also eminently representative of rious aspects of this many-coloured age e in, and earnest students of the questions, us, political, social, scientific, as well as c, in the development and solution of will lie the history of the future, and the n and colour of the coming days which ildren and children's children will see. no dreamer to promise myself, or to esy, that beauty will triumph over ugli- in the near future, any more than that will triumph over evil; yet I cannot but ourage in the knowledge that upon these genuine artists, to be put off no more bad work, to be cheated no longer by s, to be satisfied no longer by good inten- and to be exploited no longer by com- alism, will lie in such large measure the tion of the arts of the twentieth century.

ARCHITECTURE AT THE ROYAL ACADEMY.—IV.

72. "St. Alban's Church, Streatham Park; ior view:" Mr. E. H. Martineau. A solidly- ed pen-drawing of a solid-looking round- ed Gothic interior. The nave arcade, brick square soffit only relieved by a roll-mould- at the edge, is carried on cylindrical stone mns. The carved capitals, which are rather iedly sketched in, do not seem to have quite gh force for the heavy abacus over them. open timber roof is treated with carved es and tie-beams worked into cylinder sec- between the brackets and the junction with king-post. It may be rather a question ther this manner of treating a wooden tie- n does not suggest too much of the tie and little of the beam, and regarded as a mere it looks rather heavy in the proportions ssarily employed in wood.

773. "David; Twelfth-century Byzantine aic, Daphne, Athens;" Mr. R. W. Schultz. areful coloured drawing, with gold back- und, of a figure clothed in white drapery ved by blue lines, and with a blue cloak a broad gold edging relieved by an alter- ing ornament of dark squares and white tings. The upper portion of the drapery is y effectively designed, and the figure is a example of its class.

1,774. "Home for Ladies, Hove"; Mr. T. J. nson. Sufficiently home-like, and the re- sed doors, under a wide low arch, have a good ect. The houses are treated as a symmetrically igned gabled terrace, with projecting wings. plan showing the manner of arranging one use would have been a useful addition.

1,775. "St. Oswald's Church, Small-heath, rmingham"; Mr. W. H. Bidlake. A delicately- ecuted water-colour drawing, hung too high see detail well. The large solid tower stands little apart from the south-west angle of the urch, with which it is connected by a low of covering a porch which stops the end of e aisle, a similar porch balances this on the her side. The porch interposed between the wer and church might perhaps rather seem to ggest a variation in treatment. A plain ire with large lucarnes rises from the tower, e angles of which terminate in turrets a little ort in proportion for their width: turrets of mewhat similar character form the finish to he buttresses at each side of the west front. he general expression is all in keeping, solid, ut perhaps a little heavy. A plan is added.

1,777. "Design for a Staircase; Interior;" Ir. T. Armstrong Stenhouse. A well-executed oloured drawing of a sumptuous staircase in rather free classic style. The upper landing s carried on a large semi-circular arch with ow springing, built of white marble with carved pandrels, a moulding and a plain frieze of ellow marble over. The handrail and balus- rade are treated very solidly, not with open balusters but with closed panelling, diversi- ied by a circular sculptured panel in the entre of each flight. The newels are square architectural erections with clustered colon- ettes and finials. From the colouring we resume this portion is intended to be wood. This looks a little heavy in effect, but a purpose is given to the treatment by showing the balustrade return on the landing as a surbase to an arcade with classic columns, through which is seen an organ. Generally speaking, however, it is certainly preferable to employ for a staircase a design showing lights through either balusters or pierced work; the effect of so much solid "partition" is apt to be heavy.

1,778. "26, Wigmore-street, and 86, Wimpole-street": by Mr. J. L. Pearson. These are shown in two very neatly-finished coloured elevations in one frame; apparently terra-cotta fronts; terra-cotta has rather taken up its station in Wigmore-street of late. The style cannot be labelled and ticketted according to accepted nomenclature, though there is considerable Elizabethan feeling about it. The ground floor shops are treated with plain windows with wide moulded three-centred arches; portions of the longer front emphasised by a series of pilasters and a gable over them; the intermediate spaces are left with plain walling, pierced in some parts with mullioned windows without decoration. The decorative detail, very carefully shown, seems in some places a little hard and mechanical, but the whole effect is well suited to terra-cotta.

1,779. "St. Peter and St. Paul, Charlton, Dover; Southwest View;" Mr. Jas Brooks. We shall publish in our next a reproduction of this perspective drawing, a finally-executed one in pen and ink, as well as a sheet of geometrical drawings of the same church, which do not appear at the Academy. The design is plain almost to sternness; the west front is treated with three tiers of lancet arches, the lower tier spaced a little apart, the upper ones drawn together forming a continuous arcade; the front is flanked by plain massive buttresses ending in gablets, and on the north side is the plain square saddleback tower, the upper portion of which is battered slightly, the lines falling in towards the top; there are plain lucarned lancets on each face in the upper story, the solid masonry of the lower portion is only broken by one or two slit lights. The low sloping roof connecting the base of the tower with the church leaves a rather awkward angle between its lines and those of the tower wall; we presume this sloping roof represents the end of a passage aisle (no plan to show this), and the design is in that case strictly truthful, but the tower seems crushed a little too close against the northern buttresses of the nave. The transept is treated in an equally plain manner, and its west wall presenting an unbroken expanse of wall. The nave wall has single lancet lights, one to each bay. The whole is a thing that looks built for massive endurance and not for show.

1,780. "The Wall Decoration Leading Into Lady Chapel, Folkstone Parish Church; the Tree of Jesse;" Mr. A. O. Hemming. We publish an illustration of this drawing in the present number, which of course cannot show the colour. The branches of the tree are a dull red in tone, with leaves partly in a lighter tint of the same, partly in a delicate green. The draperies of the figures are treated with a considerable variety of rich and harmonious colour. The design is original and effective, and suggests something rather new in the way of ecclesiastical wall decoration.

1,781. "City Bank, Ludgate-hill;" Mr. T. E Collcutt. This is one of the best line drawings in the room, and a very rich and effective piece of street architecture. A plainly-treated ground story built in large blocks, with a large round arched window and a strongly-marked moulding at the first floor level; above this the treatment of the windows is very varied and picturesque. A slightly-projected buttress, semi-hexagon in plan, on each side of the window in the ground story, is further developed above, and becomes a solid pier dividing and strengthening the series of windows. A coved convex cornice runs along the top, with plaster (?) decoration, and from behind the balustrade over this rises a gable the front of which is nearly solid, except for the tier of windows continued along its base. The angle of the building is canted, and over the entrance door rises an octagonal turret corbelled out, and finishing in a small cupola. There is a great deal of thought and contrivance in this design, carried out to a very pleasing and picturesque result.

1,782. "View of Peterborough Cathedral;" Mr. Arnold Mitchell. This is the drawing which was produced in our English Cathedrals series in the issue of the 4th of April, and is in fact the property of this journal, for which it was commissioned from the artist, though exhibited here in his name. Under the circumstances, we of course pass it over without further remark than to record its presence on the walls.

1,784. "Cottages, stables, and farm buildings at Clipsham Hall, Rutland;" Mr. Arthur Young. This is a large bird's-eye view executed in sepia of a large group of buildings which appear picturesque as far as can be judged at the height at which the drawing is hung. As the work of an architect who is an expert in farm-building, plans, elevations, and sections would have been more to the purpose, for farm-building is a class of architecture in which economy of structure and technical convenience of plan are of such importance, for any possibility of financial success in farming, that picturesqueness is quite from the purpose unless these practical claims are first fully satisfied. Here we have the picturesqueness only, with nothing to show how the building fits its purpose. We may again comment on what we have several times noticed before: viz., the persistency with which birds-eye drawings are hung, at the Academy, at the highest possible point, in defiance of the conditions of perspective.

1,785. "Portion of a design for a ball-room:" Mr. W. F. Randall. A large and richly-coloured elevation showing four bays of the side of a classical room, gorgeous in marbles and stained glass. The piers show each two marble pilasters of a Corinthian order, with decorative panels with figures between: the order carries an entablature and that again a balustrade, apparently the front of a gallery, and over this is an arcade, the springing of the arches being of the level of the balustrade. The effect of this is not very satisfactory, as the arches appear to belong to the order and yet to be too much separated from it; that is the effect in elevation, possibly plans and sections or a perspective might have showed it in a different light. The details are carefully executed, and the effect of the whole is sumptuous though not very original.

1,787. "The Courtyard, Claridge's Hotel, Brook-street;" Mr. W. D. Caröe. A pen-and-ink view showing two sides of a courtyard, on the left an arcaded loggia on the ground story, with rusticated columns and a balustrade over; at the end of this a semicircular projecting bay sits rather piquantly astride of the balustrade; the general character of the building is more or less Elizabethan, but with a free treatment. There is too large a development of what we are disposed to term bottle-stopper finials on and about the gables.

1790 "Great Hall, Rhinefield, Hampshire;" Messrs. Romaine-Walker and Tanner. This is a large and fine pen-and-ink drawing, one of the best in the room, of a spacious hall of a mansion, with an open timber roof of very elaborate design. The details partake both of Elizabethan and of Gothic, and in the roof the traceried Gothic arcades introduced as part of the ornamental treatment seem at variance with the feeling both of the finials and of the pierced strapwork ornament of the spandrels of the roof-principals. The lower part of the hall is wainscotted, with a Ionic pilaster order. Above the cornice of this runs a balustrade on the first floor level, of odd design, the square balusters being designed in imitation of masonry, with joints cut upon them. If this is old (we believe the house retains some ancient portions amid the modern additions) it is interesting: if it is new, it is bad taste, with which moral we will conclude for the present

THE IRON, HARDWARE, AND METAL TRADES PENSION SOCIETY. The forty-eighth anniversary festival dinner will take place in the hall of the Ironmongers' Company on May 26, under the presidency of Mr. Howard J. Kennard, Chairman of the Blaenavon Co. and Falkirk Iron Co. About fifty years ago this charity was founded by Mr. R. W. Kennard, M.P., with the view to contribute relief of a permanent character to distressed members of the iron and steel industries of the upper ranks; and as showing the need existing for such an institution, it has, through its agency, distributed in the form of annuities a sum closely approaching 100,000*l.*

NEW R.C. CHURCH, CULLYHANNA. On the 18th inst. the foundation-stone of the new Church of St. Patrick, Cullyhanna, Parish of Lower Creggan, County Armagh, was laid by the Rev. Dr. Logue. The first contract for the new church is estimated at 1,500*l.*, exclusive of woodwork, ceiling, flooring, plastering, altars, &c.; and that for the erection and completion of the new Presbytery will be about 1,700*l.* The architect is Mr. William Hague, Dublin. Mr. James Wynne, Dundalk, is the builder.

Illustrations.

MURAL DECORATION,—"THE TREE OF JESSE."

THIS illustration shows the east wall of the north transept of Folkestone Parish Church leading into the Lady Chapel, the drawing of which is being exhibited in the present Royal Academy. The design occupies the entire wall, and represents Jesse lying asleep, and rising from him a tree bearing on its branches his descendants, figures of the kings of Israel, little short of life-size in soft and harmonious colours among delicate foliage work, the tree terminating with the Virgin and Child together, with two angels holding a dossal behind the Virgin, and three angels flying forward beneath her feet bearing the text, "Of whom was born Jesus who is called Christ."

The whole was designed and executed by Mr. Alfred O. Hemming last autumn, who also last week completed the entire set of the "Stations of the Cross" on the walls of the nave, the first three of which we illustrated in our issue of August 23, 1890, besides a choir of angels in the roof of the tower over the choir stalls, and several other special figure-subjects, all of which are to be dedicated to-day (Saturday).

ST. MARY'S CHURCH, NEWBURY.

MONEY is now being collected to complete the work begun by the late Mr. Street in 1879. At that time a new chancel, organ-chamber, and vestry were built, at a cost of 4,250*l.*, but no design was made for anything further. It is proposed to complete the work by building a nave, aisles, and transepts, on the old foundations. The body of the church at present is a mere square room, without an arcade, and the flying buttress attached to the south wall of the narrow part of nave will resist the thrust of the new arcade. The narrowing of the west end is necessitated by the position of the old foundations. This was originally the site of the chancel, but it was found more convenient to build the new one at the other end.

The architect for the new work is Mr. Arthur E. Street. The drawing from which the illustration is taken is hung in the Royal Academy Exhibition.

FIGURES FROM WINDOW, ST. MARY'S, STAMFORD.

THE lithograph represents the figures in two of the compartments of a window designed by Mr. C. W. Whall, and carried out under his direction by Messrs. Britten & Gilson. A sketch of the whole window is given on another page, and a description of it is given in Mr. Whall's paper on "Stained Glass," read at the Liverpool Art Club, the concluding portion of which is printed in the present number.

DERBYSHIRE GENERAL INFIRMARY.

THE new hospital for the county of Derby will consist of thirteen blocks of buildings, which for the purpose of description may conveniently be numbered as follows:—1. Front administration. 2. Back administration. 3. Laundry and engine-house. 4, 5, 6, 7, and 8. Ward pavilions. 9. Out-patient department. 10. Chapel. 11. Operation-room. 12. Home for nurses. And 13. Mortuary.

The central block round which the wards and other buildings are grouped is No. 1. The front administration: This is a three-story building, and contains, on the ground floor, the main entrance to the hospital, with the secretary's office, waiting-room, porter's office, and room for medical staff closely adjacent. The eastern part of the ground floor is devoted to the casualty department, with its separate entrance, waiting-room, consulting-rooms, and a small ward for cases of urgency. On the first floor is the board-room, with the residential quarters for the medical staff and the matron. The second floor is devoted to bedrooms for the servants.

This building is connected to the back Administration (Block No. 2) by a corridor and again to the main Hospital corridor, which, running at right angles, divides the block in question into two unequal parts.

The lower or larger part of the block contains on the ground floor the stores, linen-rooms, &c., and on the upper floor the kitchen offices and larders. The upper or smaller part contains on the ground floor the nurses' dining-room, servants' hall and pantry, and on the upper floor bedrooms and sitting-rooms for the porters

Block No. 3 contains the laundry with a separate washhouse for infected linen, the boiler-house, engine-room, disinfecting-house, and cremator for refuse.

Block Nos. 4 and 5 are similar in all respects, so that a description of one will suffice for the other. Each block is approached from the main corridor by a covered bridge with free ventilation at each side, and of sufficient height only to afford proper head room. The object of this arrangement is to isolate each ward from aërial contact with the other wards, and thus to prevent the connecting corridors being channels for the conveyance of air from one ward to the other.

At the entrance to the pavilion will be found spaces for coal bunkers, cupboards for ward linen, patients' clothes, and food, a w.c. for the use of nurses, and a cupboard for brooms, pails, &c. Close to the entrance to the ward on one side of the corridor is a separation ward capable of holding two beds, and on the other side a nurses' duty-room or ward kitchen.

The wards are 127 ft. long, 29 ft. wide, and are arranged to hold twenty-four beds each. Each bed is separated from its neighbour's by a window, and each patient will have 145 ft. floor space 1,890 ft. cubic space. The floors will be laid with teak, or some similar hard wood, bedded directly on concrete, and the framework of the floors and ceilings will be of iron bedded in concrete. In the finishing of the walls, floors, ceilings, windows, and doors, all internal angles will be rounded in order to provide no avoidable lodging places for dust. The wards will be warmed partly by open fire-places placed in the centre with descending flues, and partly by steam coils placed in window recesses and provided with fresh air from outside.

At the further end of the wards are two towers connected with the wards by covered bridges containing the sanitary offices and the bath-rooms. Between these towers are balconies for the use of convalescent patients.

Block 6 is on the ground floor, exactly similar to Nos. 4 and 5. On the upper floor it contains six small wards for one bed each, and a general ward for ten beds, all of which will be allotted to the gynæcological department. Block 7 is similar in all respects to Nos. 4 and 5.

Block 8 is a two-story building, and will be devoted on the ground floor to diseases of the eye. It contains two wards for six beds each, and has, in addition to the usual ward offices, a separate operation-room, with a recovering-room attached. The upper floor of this block contains two wards for children, with the necessary offices.

The out-patient department (No. 9) is at the extreme south-east end of the main corridor, and is a one-story building.

The entrance for patients is in the centre of the front facing the London-road. Immediately inside the entrance are two small waiting lobbies for new patients, separated from each other by the porters' office. From these access is obtained to the general waiting hall. Off this hall are placed the four consulting-rooms, each of which is provided with a small examining-room. From these consulting-rooms the patients will go to a second waiting-room, where they will wait their turn to receive their medicines from the dispensary. Behind the dispensary is the pathological department and museum.

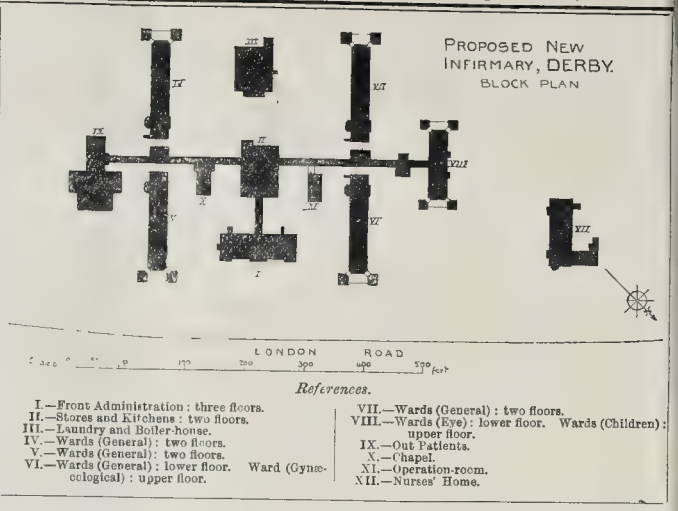
The chapel (No. 10) is placed midway between the back Administration and the Eastern Ward Pavilion (Blocks 4 and 5).

In the corresponding position to the last on the western side of the Administration block is the operation-room. Beside the operation-room itself there is a room for the administration of anæsthetics, and a room for the staff. The operation-room will be lined with marble slabs up to a height of between 7 ft. and 8 ft., above which the walls and ceiling will be painted and varnished. The floor will be laid with "mischiati," which consists of marble chips bedded in cement, and forms a very hard impervious surface. In all its details every effort will be made to secure as entirely "a septic" conditions as possible.

The Home for Nurses (Block 12) is a detached building, and will afford accommodation for forty-eight nurses. Each nurse will have a separate bedroom and separate sitting-room, and reading-rooms will be provided for the staff nurses and probationers respectively.

The Mortuary Block (No. 13) is also a detached building, and will contain in addition to the Mortuary and *Post-mortem* Room, a separate chamber where bodies will be placed for friends to view, and an ambulance-house and stable.

Externally the buildings will be faced with red bricks, with Bentley Brook Stone mullions, cornices, and mouldings. The style adopted is late Elizabethan. The architects are Messrs. Young & Hall, of London.

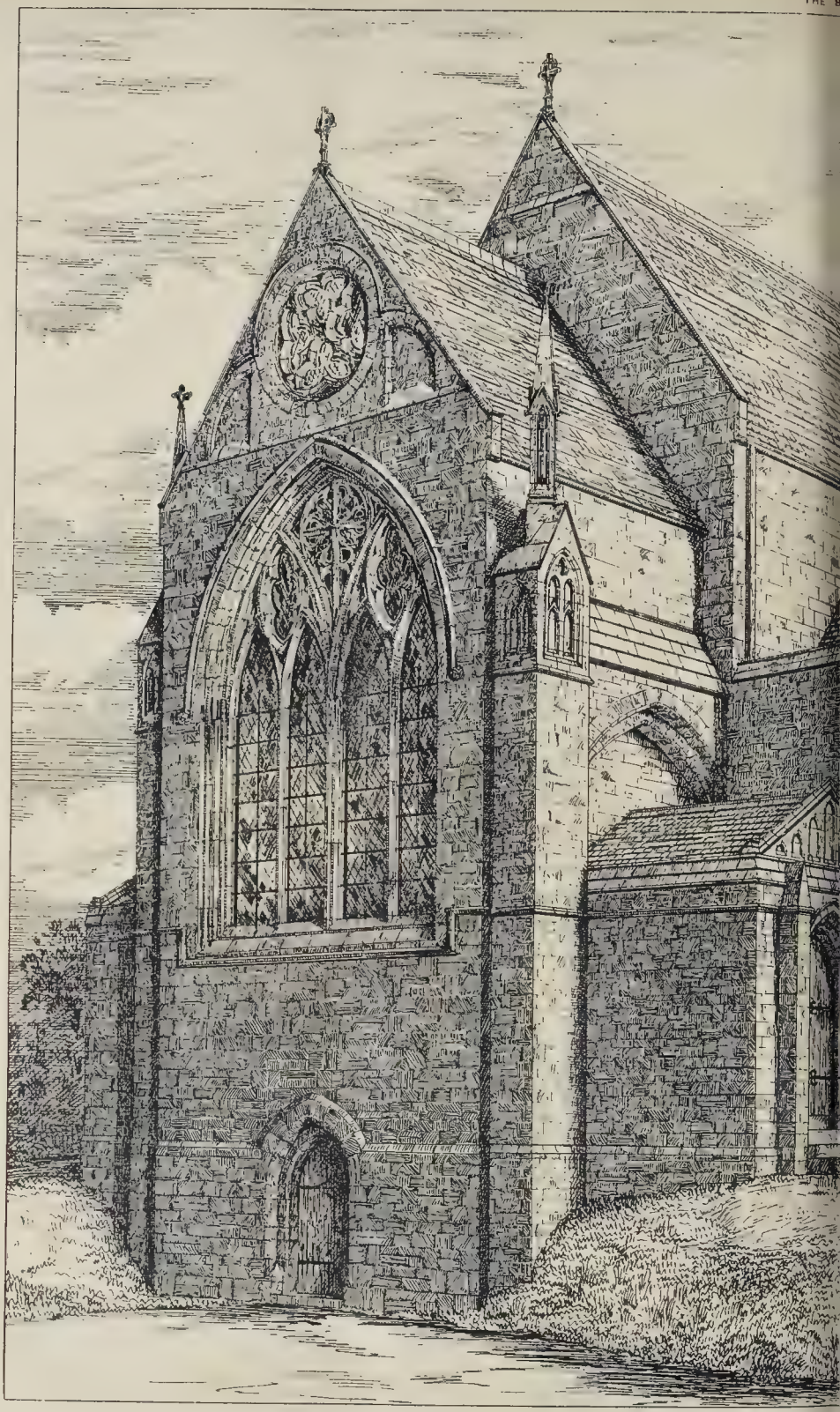


References.

I.—Front Administration: three floors.
II.—Stores and Kitchens: two floors.
III.—Laundry and Boiler-house.
IV.—Wards (General): two floors.
V.—Wards (General): two floors.
VI.—Wards (General): lower floor. Ward (Gynæcological): upper floor.
VII.—Wards (General): two floors.
VIII.—Wards (Eye): lower floor. Wards (Children): upper floor.
IX.—Out Patients.
X.—Chapel.
XI.—Operation-room.
XII.—Nurses' Home.

RECENT ARCHITECTURE IN PHILADELPHIA.

PHILADELPHIA, notwithstanding its million or more of inhabitants, and its position at the head of the manufacturing towns of the United States, until very recently possessed fewer structures exhibiting either architectural merit or even magnificence than any other of the large cities of the Union. When William Penn, some two hundred years ago, laid out the Quaker City, he had evidently not gauged the dimensions of the North American continent, or he would never have made 50 ft. the limit of width between the building lines of the opposite sides of the streets, still less would he have permitted the entrance steps on each side to project 4 ft. 6 in. beyond that building line. Yet even Penn's original city was in its conception far in advance of contemporary cities of the Old World, and it was not his fault if that perverseness of commerce which is exhibited in similar modes in so many other towns, was shown in Philadelphia by the



ST. MARY'S CHURCH, NEWP

No. 1838, Royal Academy Exhibition, 1891.



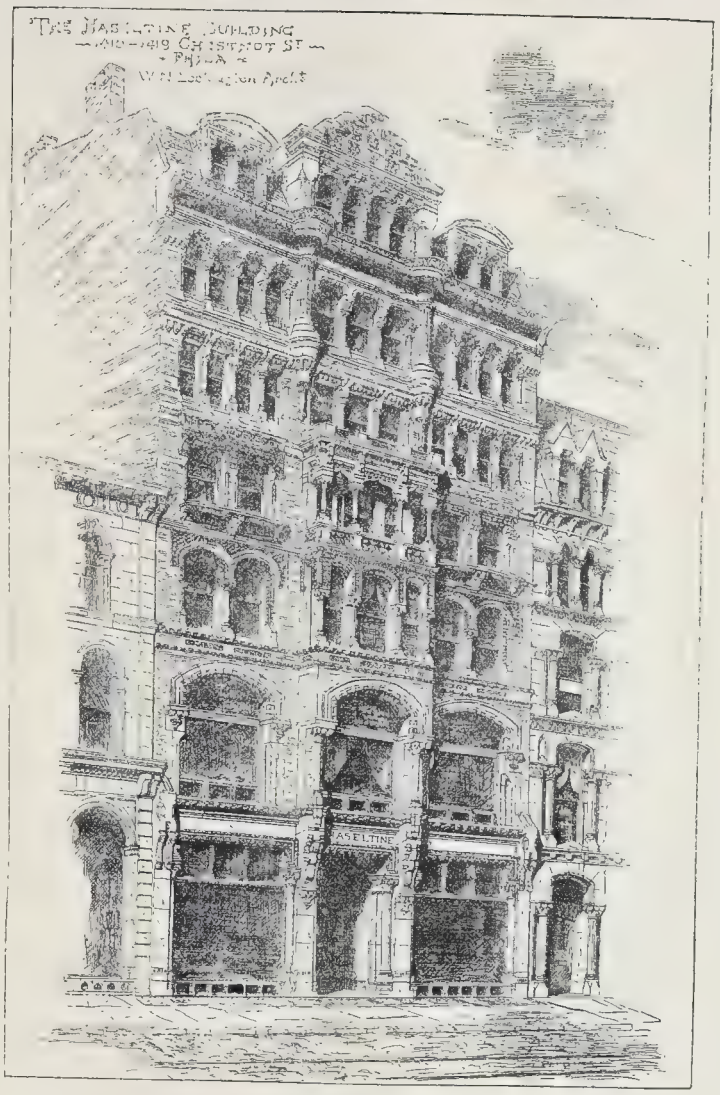
STREET, M.A., ARCHITECT.





HE WALL DECORATION LEADING INTO LADY CHAPEL, FOLKESTONE PARISH CHURCH.—"THE TREE OF JESSE" By Mr. A. O. Hemming.

No. 1250 Royal Academy Exhibition 1891



ctical refusal to make use of the two widest nues, Broad and Market-streets, as the ncipal thoroughfares, and the preference ead of Chestnut-street, which though now ewhat widened by the gradual confiscation ive additional feet on each side, is probably narrowest main business street in the entire ited States.

he buildings of Penn's time, notwithstand- that rectangularity of outline and lack of rnment which characterized all structures cted by the Society of Friends, were sub- ntially built of red brick, or, in the neigh- ring villages which now form the suburbs of great city, of the local micaceous gneiss, this at a period when wood was by far the t usual building material in other parts of country. But, while the street architecture ther American cities gradually improved in gn, or at least in dimensions and magni- nce, that of Philadelphia remained sta- ary, preserving its Quaker simplicity almost hanged until within these last few years,— l, in fact, the Centennial Exposition opened eyes of the natives to the fact that the ld outside of Philadelphia, in America as as in Europe, was alive and busy.

or the first time in their history Phila- hians began to feel a slight suspicion that, after all, other cities and other countries might know a few things that a Philadelphian might learn with profit. Some slight fear that possibly they might in some things be behind some other American cities, or even (horrid thought) behind some of the towns of the Old World, intruded itself upon their accustomed sense of superiority. From that date the architecture of Philadelphia has improved, slowly, it is true, —Philadelphians never move swiftly either in a forward or backward direction, as may be perceived by one who watches the pedestrian and vehicular currents of Chestnut-street, yet still surely.

The majority of the residence streets of Philadelphia—Philadelphia in 1888, except in suburban districts, differ from those devoted to retail trade in little more than in the absence of plate-glass. The dwellings are ranged in close rows, and most of them still retain their old characteristic features, viz., red brick fronts, white marble sills and steps, conductors discharging upon the sidewalk, outside blinds (usually painted green), and plain rectangular windows. Yet here and there, during the last few years, the monotony has been broken by a residence, or perhaps a series of residences, conceived in some variety of the modern manner commonly known as Free Classic, or Queen Anne; here and there brown stone façades, the work in great part of the decade of the centennial, diversify the red brick sameness; and occasionally structures evincing originality either in their detail, openings, or general form, prove that the architects of Philadelphia, though they may be less numerous and less known to fame than her lawyers, are at least alive and thinking.

The finest examples of modern Philadelphian domestic architecture are not to be met with in the city proper, but in such extensive suburbs as Germantown, Chestnut Hill, Bryn Mawr, &c. The most magnificent of these suburban mansions rival in size baronial castles, and are constructed of solid stone. Picturesqueness, both in these larger houses, and in the, for the most part, smaller ones into the construction of which brick, terra-cotta, and wood enter more extensively, appears to be the chief aim of the architects externally. It, perhaps, scarcely need be said that, though sometimes this object is attained, in many cases it is wofully missed. Many designers in Philadelphia, as elsewhere, appear to forget that, though a picturesque building may often be also an irregular one, it is not every irregular structure that succeeds in being picturesque. Some of the oddities perpetrated in the names of Queen Anne

and Old Colonial will, within a few years, seem as inartistic as their predecessors, the plain square boxes, appear to the present generation, since their only claim to the title of artistic is on account of their oddity.

Previous to the Centennial, the white marble imitation of a Greek temple which forms the central attraction of Girard College was the edifice of which Philadelphia was most of all proud, though great hopes were built upon the future glories of the French Renaissance New City Hall. As years rolled on, the latter structure rose slowly from its foundations, developed its four exactly similar façades of exactly symmetrical design, displayed a considerable quantity of tolerably good carving, was topped off with a mansard of enormous proportions, and stood in all the majesty of completion, at least as regards its external appearance, excepting only the upper portion of its immense tower. But in the long course of its erection taste had changed, and the vast edifice no longer pleased. The style was out of fashion, the design wearisome from its sameness, the mansard top-heavy, and, above all, the entrances which gave access to the interior court, especially the one beneath the tower, diminutive and dismal. Thus most Philadelphians are now ready to agree in finding faults in their costly municipal pile, notwithstanding its undoubted magnificence and its huge bulk.

At the date of the commencement of the New City Hall, Renaissance façades of white marble were in fashion upon Chestnut and other leading streets. Very few have since been added, though within the last four years an immense office building, owned by, and containing the bank of, Messrs. Drexel & Co., constructed internally of iron, and faced throughout with white marble, has been completed.

Among the first, if not actually the first, architects to break away from the stereotyped models, were Messrs. Furness & Hewitt. Their Academy of Fine Arts exhibits much originality, and gains increased effect by the employment of materials of different colours. Later on, the former of these gentlemen constructed the edifice occupied by the Provident Life and Trust, a single great hall with an extraordinarily massive, or, in the esteem of some critics, heavy façade of great originality of design towards Chestnut-street. Mr. Furness has since erected numerous residences, as well as many of the principal banks and commercial structures of the city, and is on all hands recognised as an original genius. His style inclines rather more toward what may be called Free Gothic than towards Free Classic. The Bank of the Republic, an extremely picturesque irregular château-like building on Chestnut-street; the Penn National Bank, and the depôt of the Baltimore and Ohio Railroad, are among his recent works. Few architects beside Furness would have dared to form an entrance out of a heavy half-arch abutting against a circular turret, as he has done in the first of these edifices. In the interior of the same bank two half-arches abut against a central stone fireplace, thus composing a symmetrical termination to the hall. The Unitarian Church on Chestnut-street, near Twenty-second-street, with its very peculiar low, one-storied, open tower, is also the work of this architect.

Among the edifices designed by Messrs. Hewitt Bros. are the Guarantee Trust Building, which may be called Victorian Gothic, and is another example of what, until some four years since, was the Philadelphian beau-ideal of a bank-building, viz., a spacious lofty hall lighted from the roof. The Hahnemann Hospital on Broad-street, a Gothic structure with a cornice of small pointed arches; the Fidelity Bank, and the enormous and fortress-like Bullitt Building—a far-away echo of H. H. Richardson—are others of the Hewitt's designs.

Notwithstanding the high value of the ground upon the principal streets, it was not until 1887 that Philadelphia perceived the advisability of erecting lofty commercial structures. Up to that date very few buildings, even in the central parts of the city, exceeded four stories in height. A bank building having several stories of offices above the ground floor used for banking purposes was considered as offering too many facilities to burglars, and lofty buildings in general were stigmatised as "New Yorkian," and therefore abhorred of all true Philadelphians. But in this case, as in many others, the love of profit conquered pride. It became so evident that it was financially foolish to erect a structure of a single story upon a site the value of which was equal to that of a many-storied building, that at last the Quaker city was, however unwillingly, converted to the architectural creed of New York.

The first lofty office-building run up was at the corner of Fourth- and Chesnut-streets. The ground floor is the bank of Brown Bros., the site is only 50 ft. square, while the height is more than twice as much, so that it is a veritable tower. The architect was T. P. Chandler, previously well known for his success in the attainment of the picturesque in his designs for country dwellings, and also as the architect of the office-building of the Liverpool, London, and Globe Insurance Company. The Brown building is a somewhat free Renaissance, with no especial original features, and destitute of the picturesqueness of the designer's country cottages and mansions, yet it deserves notice as the first tall building, and the first large white brick building, erected in Philadelphia. Soon after this uprose the gigantic Bullitt building, which fronts four thoroughfares, rises to more than twice the width of Fourth-street, and mingles much small detail carved in brown stone with great massiveness. The uppermost story is a restaurant, accessible by ample lifts.

The Haseltine Building was the first of the new tall structures of Philadelphia to be designed, but its commencement was postponed for a year, so that it was not completed till the summer of 1888. It stands upon a site 230 ft. by 54 ft., and consists of a lofty seven-story building on Chestnut-street, an eight-story ditto on Sansom-street, and between them a lower portion lighted from the roof. The ground floor is occupied by two large stores, while the second floor is entirely occupied by the gallery of the well-known picture-dealer, Mr. Chas. F. Haseltine. The Chestnut-street front is very polychromatic, since it is faced with buff brick adorned with belts and window-dressings of red terra-cotta, has a main cornice of copper, and exhibits much Indiana limestone on its lower floors and in the massive cornice corbels that support the central pediment. The style is a mixture of Renaissance and Gothic, horizontal lines predominating, while most of the openings are either segmental or semi-circular headed, and many of the mouldings are of Gothic section. Mr. W. N. Lockington was the architect.

Among the Free Classic structures recently erected are the offices of the Insurance Company of North America and the Imperial Building, both in Walnut-street, and both the work of a Bostonian architect. Carving executed in brick; and copper, showing as such in bays, &c., are conspicuous in these.

The façade of the Horticultural Hall on Broad-street, the Wood Building (offices), and the tall structure at the junction of Broad and Chestnut-streets, for the Girard Insurance Company, are the work of Addison Hutton. The last-named building, with its window-jambs of clustered colonnettes, shows also the influence of Richardson.

The lofty building which occupies the site of the old Masonic Hall possesses features of considerable originality, and is the work of W. G. Hale, who is also known as the designer of the Record Building and the Keystone Bank, both on Chestnut-street. The latter possesses a pleasing and picturesque, though narrow, façade.

The writer left Philadelphia in the autumn of 1888, and, as he has not since visited it, cannot speak of the structures commenced since that date. Still, he has heard enough to know that the movement for lofty and expensive buildings in the main thoroughfares continues, and that the distinctive Quaker architecture of the city is doomed to extinction in the principal streets.

W. N. L.

The "A.A. Lyric Club."—The eighth and last smoking concert of this Club was held at the "Mona" Hotel, Covent Garden, on Thursday, the 14th inst., the President, Mr. W. Burrell, in the chair. A number of songs were well sung by Messrs. A. C. Balmer-Booth, André, A. B. Thomas, F. E. Lacy, and Captain H. W. Anderson. Mr. F. T. W. Miller gave a humorous reading, and Mr. C. D. Imhof was the accompanist.

Change of Partnership.—We are informed that Mr. Erasmus Bond retired from the firm of Arding, Bond, & Buzzard, surveyors, at Lady-day last, having been a member thereof for thirty-two years. His son, Mr. Douglas Vale Bond, joined the firm nearly five years ago. The business will be carried on by Messrs. Chas. B. Arding, Alfred L. Buzzard, and Douglas V. Bond, as before, in the name of the old firm, "Arding, Bond, & Buzzard."

ARCHÆOLOGICAL SOCIETIES.

London and Middlesex Archæological Society.—A largely attended meeting of this Society was held on the 13th inst. at St. Paul's Cathedral, which the members visited preparatory to a subsequent meeting at the Chapter-house, in St. Paul's Churchyard, where a paper was read by the Rev. W. Sparrow Simpson, D.D., F.S.A. (vice-president), entitled "The Bishop of London's Palace." Dr. Simpson said this palace formerly stood at the north-west corner of St. Paul's Cathedral. Writers differed as to its exact position, but later accounts showed that the palace contained a lower chapel, which suggested that there were two chapels, but probably it was like Lambeth Palace, which had a crypt, which would be the second chapel. In the Great Fire of 1561, the Lord Mayor and citizens were called upon to protect the Bishop's Palace, and by great labour and diligence a portion of the roof was pulled down, and through the space thus created the fire was not allowed to spread, and thus the Bishop's Palace was saved. A plan drawn by Mr. Penrose, the Surveyor to the Dean and Chapter, was submitted, showing that the structure was formerly an elaborate one, and it was mentioned that in the current number of the *Newbery House Magazine* there was a very interesting paper by Mr. H. W. Brewer, who had also drawn a plan of this palace, but the essayist thought that Mr. Brewer had placed the palace at an angle which it could not have occupied. It was plain that the gardens of the palace extended beyond Ave Maria-lane, and the garden on the west was divided from Ave Maria-lane by a high brick wall reaching to a house in Paternoster-row, the whole length of this garden being about 200 ft. Among the eminent persons who formerly lodged at the Bishop's Palace, Dr. Simpson named Queen Catherine of Arragon, and the festivities which followed her marriage with Prince Arthur (who died six months afterwards), and then with his brother Henry (afterwards King Henry VIII.). The building combined the elegances of a palace with the requirements of a prison; it contained two prisons known as the Coal-house and the Salt-house, the latter being capable of holding fourteen persons. Rose-street and Ivy-lane suggested the fact that the palace gardens formerly stood close by. Mr. Charles Welch, F.S.A. (hon. secretary), next read a paper on "Some Notes of Early Printers in the neighbourhood of the Cathedral," and said that the nomenclature of the courts and lanes in this locality was evidence of the former existence of book-makers here. There was much evidence also to show that printing presses must have started here very soon after the invention or introduction of the art by Caxton. It appeared from registers that in 1556 there were thirty-two booksellers and publishers in London, and in 1557 there were thirty-three, and in 1558 there were thirty-six, and the curious fact had been revealed that of these thirty-two printers in 1556, no less than fifteen of them lived in St. Paul's Churchyard, eight in Fleet-street, two in Lombard-street, one in Aldersgate-street, and one in a locality unknown. The shops of the booksellers and printers were in some cases situated at the doors of the cathedral, as in the case of John Kingston, who had his stall at the west door. Most of the early printers had signs attached to their houses: thus, Richard Jugge dwelt at "The Bible," at the north door of the cathedral; and the widow Toy at "The Bell," in the churchyard. In 155[illegible] there were Reginald Wolf at "The Brazen Serpent"; John Turk at "The Cock"; William Seres at "The Hedgehog"; John Cawood at "The Holy Ghost"; Abraham Veale at "The Lamb"; William Bonham at the "Red Lion"; John Wright at "The Rose"; Michael Lobley at the "St. Michael"; Anthony Kitson at "The Sun"; John King at "The Swan"; Andrew Hester at "The White Horse"; besides John Kingston, all in St. Paul's-churchyard. Of these, John Cawood was Royal Printer under Queen Mary, at a salary of 6*l.* 13*s.* 4*d.*, and he was continued in office with Richard Jugge (aforesaid) under Queen Elizabeth. John Cawood was a Warden of the Stationers' Company, and a frequent benefactor to the Guild. Another well-known printer at that time was John Day, whose enterprise and business capacity raised around him a host of enemies. In conclusion, the author said that time did not permit him to speak of the works of [illegible]





FIGURES FROM WINDOW IN THE CHURCH OF ST. MARY, STAMFORD.—Designed by Mr. C. W. Whall

great dramatist, and other precious gems of literature, which were printed and published in the seventeenth and eighteenth centuries under the shadow of the Cathedral, nor of the lamentable losses to literature caused by the Great Fire of London, when all the printers and booksellers stored their stocks of books in the vaults under Old St. Paul's, which were entirely consumed. Under the presidency of Dr. Freshfield, the members and friends afterwards dined together in the evening at the Cannon-street Hotel.

ROYAL SOCIETY OF ANTIQUARIES OF IRELAND.—A general meeting of the Royal Society of Antiquaries of Ireland was held on Monday, in the Town Hall, Kilkenny. The chair was occupied by the Rev. Dr. Walsh. The Chairman regretted that Lord James Butler, the President, was not able to preside. Mr. La Touche referred to the work done in behalf of Irish archæology by Miss Stokes. He said that she had done more than any other person for the knowledge and dissemination of early Christian art in Ireland. An ancient milk-churn and remains of a wooden dish, conjectured to be fifteen or sixteen centuries old, were exhibited, both having been forwarded by the Rev. Dr. Frazer. The following papers were then read:—"Primitive Churches in County Dublin prior to the Anglo-Norman Invasion," by Mr. W. F. Wakeman; "Notes on some Antiquities in the city of Kilkenny," by Mr. P. M. Egan; "Notes on Kells," by Rev. W. Healy. The papers were referred to the Council for publication.

SOCIETY OF ANTIQUARIES OF SCOTLAND.—The concluding meeting of this Society for the present session was held on the 11th inst., Mr. James Macdonald, LL.D., Glasgow, in the chair. Papers were read by Mr. J. Romilly Allen on the sculptured stones older than the twelfth century, and bearing symbols and Celtic ornament, in the district of Scotland north of the river Dee, obtained under the Victoria Jubilee Gift of Dr. R. H. Gunning; by Dr. Allan Macnaughton, Taynuilt, on his excavations in the South Fort in the Island of Luing, resulting in the discovery of one of the pillar-stones of the gateway, sculptured with groups of cupmarks, and the disclosure to some extent of the character of the structure; by Mr. Malcolm M'Neill on the discovery and excavation of a burial mound of the Viking period in the island of Oransay; and by Mr. Hugh W. Young, of Burghead, on the construction and characteristics of the ramparts of the fort at Burghead as revealed by recent excavations carried on by him in the course of last season. Mr. Peter Miller continued the controversy as to the site of John Knox's house, and maintained that he had produced evidence to show that it was in Turing's Close and not on the High-street. Mr. A. Hutcheson, architect, Broughty Ferry, gave a notice of the examination of a burial mound accidentally discovered at Gilchorn, parish of Inverkeillor, some months ago. Mr. A. B. Richardson, curator of coins, gave a detailed description of the coins in the Skye find recently reported.

THE "EDDYSTONE LIGHTHOUSE" AT THE NAVAL EXHIBITION.

IN our last issue we promised to give some particulars of the model of the new Eddystone Lighthouse at the Royal Naval Exhibition. Designed by Mr. John J. Webster, M.Inst.C.E., of Liverpool, it forms one of the most conspicuous, and one of the most interesting features of the Exhibition. It is a full-sized representation of the new Eddystone Lighthouse as designed by Sir James N. Douglass, F.R.S. The model externally is, as nearly as possible, allowing for difference of material, a perfect representation of the original structure; the windows, doors, ladders, lantern, and even the courses and size of the stones being accurately copied. Internally the structure consists of a steel and iron framework, covered first with wooden battens and "expanded metal" netting, which in their turn receive the fibrous plaster, the natural colour of which very nearly approaches that of the granite in the original structure. The framework consists of six braced main ribs radiating from the centre, and so constructed that when erected a clear hexagonal space 9 ft. wide is left in the centre, in which are placed the two passenger lifts for taking visitors to the top. The ribs are constructed of steel and wrought-iron rolled beams, T, L, angle, and flat bars firmly bolted together, each rib being divided into thirteen bays, the level of each bay corresponding with the floor lines in the original structure. The main ribs are secured by thirty-six strong iron bolts firmly attached to strong anchor plates embedded in cement concrete nearly 20 ft. below the surface of the ground, to ensure the stability of the structure during gales.

The height of the structure from the ground to the top of the lantern roof is about 170 ft., and the base is 44 ft. diameter, and 19 ft. high, from this base, which has vertical sides, springs the curved structure, having a diameter of 35 ft. 6 in. at the bottom, and of 19 ft. at a point 6 ft. below the lantern platform. From this point the structure swells out to a diameter of 24 ft. at the platform, upon which is erected the lantern to receive the lighting apparatus. The lantern is 14 ft. diameter, thus leaving a gallery of 5 ft. wide all round; it is 16 ft. 6 in. high, and is glazed with diamond-shaped panes, as in the original, the whole being surmounted by the wind vane, which is a copy of the original, and is 8 ft. long.

There are nearly 100 tons of iron and steel in the structure, made up of over 1,000 pieces, all of which have been marked, drilled, cut or bent to the required shape, so some idea can be formed of the immense amount of planning and labour entailed in the construction of what is only a temporary structure.

The passenger lifts referred to have been specially designed for the structure, the first consideration having been given to the safety and comfort of the visitors ascending. They have been constructed by Messrs. Waygood & Co., of Falmouth-road, London, and consist of two cages, each capable of holding eight passengers, worked somewhat on the principle of those on the cliffs at Scarborough and at Folkestone. A tank is placed under each cage with valves so arranged that it can be filled or emptied in a very short space of time. The cages act simultaneously, being connected by steel wire ropes over pulleys at the top, so that while one is discharging the passengers at the top, the other is being filled at the bottom. To put the cage in motion, the tank of the top cage is filled with water and that of the bottom one emptied, so that the top car descends by the action of gravity, and pulls up the other one. The speed of the cages is regulated by an ingenious "cataract" cylinder, actuated by the man in charge, and automatically when the cages approach the top or bottom. This cataract cylinder, it is claimed, ensures perfect safety, and is most simple in its action; an additional security, however, is obtained by means of a powerful friction brake on the top shaft, so that there is not the slightest possibility of the cages "running away." The steel ropes which sustain the cages are four in number, although, according to the engineer, one rope alone is sufficient to bear the whole load of the cages when full of passengers, and allowing a large factor of safety. Again, should the ropes break, powerful grips immediately clutch the vertical guides, and the cages would not fall more than an inch before they would be brought to a standstill. Powerful steam pumps are fixed in the basement to force the water into the tanks at the top, whence the water flows to actuate the cages; these pumps are in duplicate. The cages are made of polished walnut and other ornamental woods, well upholstered, and fitted with bevelled mirrors and ornamental lead lights in the roofs.

The structure is illuminated at night by a powerful revolving electric light, the lenses and revolving machinery being constructed by Messrs. Chance & Co., of Birmingham, and the electric lamp by Messrs. Siemens Bros.

The whole structure was designed, as already mentioned, by Mr. John J. Webster, M.Inst.C.E., and has been erected under his superintendence by Mr. D. Charteris, builder and contractor, of Page-street, Westminster, the steel wire-cables for the passenger-lifts being specially manufactured by Messrs. Bullivant & Co., of Millwall.

LOCAL BOARD OFFICES, PENARTH.—The formal opening of the Penarth Local Board offices took place on the 15th inst. The new offices, which are situated in Albert-road, are built from designs prepared by Mr. Court, the carrying out of them being entrusted to Mr. Havelock Cornish. Mr. M. H. Tape, of Penarth, was the contractor. The front elevation of the main building is designed in the Renaissance style, the balcony resting on stone corbels. The flooring of the entrance-hall consists of red, black, and buff tiles from Messrs. Ed. Smith & Co., Coalville. The stairs are of pitch-pine, with mahogany hand-rails and newel-posts.

Correspondence.

To the Editor of THE BUILDER.

"PROGRESS IN ARCHITECTURAL RESTORATION."

SIR,—I have read with some pleasure and interest Mr. Arthur Cawston's letter in your last issue (p. 395) with reference to the Abney restoration. Though I am not able to agree with all he says, yet the subject of variety in architecture and irregularity in spacing out of detail is a matter in which I have always taken a peculiar interest. The remark that was made by a celebrated French writer,—namely, that "variety is the spice of life, that it makes even ugliness bearable, and invests beauty with superior attractions,"—is one of the truest things ever uttered; but I cannot go quite so far as to believe that the employment of left-handed masons would lend an added charm to the tooled masonry; though, as to the spacing out of corbels, it is highly probable that an unequal spacing would impart a certain amount of life and vigour to the building.

What can be more charming than the undulating surface of the pavement of St. Mark's, Venice, whether it was arrived at by accident or design? What is it that imparts dignity and beauty to the west front of that building but its variety and somewhat incongruous treatment, and the loose setting out of its pillars and corbels?

It is impossible to say whether the Mediævalists did purposely set out their buildings in this haphazard manner, but if we measure almost any ancient village church, we seldom find the building set out with any great precision, and the chancel and the nave are seldom on the same axis. The inclination of Our Saviour's head upon the cross has been assigned as the reason for this, but we have no certain evidence of it.

The niches on the central gate at Rouen, which is one of the most exquisite examples of Flamboyant work, has about 176 subservient niches, and the tracery is varied in almost every compartment.

The north transept of Westminster Abbey cannot compare with this for variety, but nevertheless Mr. Pearson in this latest example of Gothic restoration has, by the vitality which he has imparted to the work, pointed out the means by which we may in some measure hope to progress towards the attainment of architectural beauty.

May 20. W. HILTON NASH.

HORROCKS'S OBSERVATION OF THE TRANSIT OF VENUS.

SIR,—Adverting to your recent notice of Mr. Eyre Crowe's picture in the Royal Academy Exhibition, it may perhaps be of some interest to recall that Horrocks observed the transit of Venus at Hoole, near to Preston, on Sunday, December 4, 1639, being then twenty years of age. Anxious to witness a phenomenon which, it is believed, had never before been noticed, and to verify his own predictions, he began his observations on the previous day; but as he himself records, did not, the while, "neglect his higher duties for these pastimes." The time of day was just before sunset, and the tube he used was, I think, about 30 in. long by 1½ in. in diameter. His account of the observation, "Venus sub Sole Visa," was published by Hevelius in his treatise, "Mercurius in Sole Visus," at Dantzic in 1662. Horrocks died at Toxteth, his native place, on January 3, 1641,—*teste* Sir David Brewster's article in the Imperial Dictionary of Biography. He is commemorated by an addition to John Conduitt's monument at the west end of the nave, Westminster.

May 19, 1891. W. E. D.-M.

**** Our correspondent's remarks do not, however, explain the nature of the instrument used in his observation, the delineation of which in the picture is not very comprehensible.

THE R.I.B.A. ELECTIONS.

SIR,—Too many of the members of the Council and Standing Committees have either never attended any of their meetings during the past session, or otherwise have only done so once or twice.

It would be regrettable if these should be allowed to stand in the way of others able and willing to give due attention to the necessary business of the Institute.

May 20, 1891. A FELLOW.

COLOUR FOR SURFACE OF TENNIS COURT.

SIR,—A friend of mine is about to lay a cement tennis court, and wishes to have the surface coloured green. He has tried mixing ordinary dry colour with cement. This kept its shade while the cement was wet, but by the time the cement was dry all colour had disappeared.

If any substance can be had which may be mixed with the cement, and will retain its colour, my friend wishes to have it, but failing this he will colour the surface after the cement is dry, and in

this case wishes to have the best possible colour suitable for the purpose.

We do not know at present what cement will be used. My friend is resident in Italy (the Lake District).

Can any reader of the *Builder* give any information on the subject? J. T.

LOST, STOLEN, STRAYED, OR DELAYED?

SIR,—On January 21 last I, with other confiding architects, prepared designs for public baths and library for the Corporation of Dewsbury. At present we are without any private or public acknowledgment that they have been received; and if I write and ask, I am at once disqualified by the terms of the competition.

ARS LONGA VITA BREVIS.

The Student's Column.

VENTILATION AND WARMING.—XX

WARMING.—GENERAL PRINCIPLES

IN considering the general principles on which the practice of warming depends, we may with advantage begin with the manner in which heat is transmitted.

This is generally described as including four varieties of operation,—radiation, conduction, convection, and circulation. These three latter may really be grouped into one, as in all of them heat is transmitted primarily by the contact of a heated molecule of matter with others adjacent, the term conduction being applied to the transference of heat from one molecule to others when they do not themselves change their position, as in the case of solid bodies, while convection and circulation are virtually the same process, regarded from different standpoints, and refer to the transmission of heat by mobile molecules, as in fluids, whether gaseous or liquid. Convection and circulation, indeed, strictly-speaking, are rather hydrostatic and pneumatic phenomena, as the actual transference of heat from one molecule to another is by actual contact, as in the case of what is usually called conduction in solid bodies.

Radiation, on the other hand, is totally distinct in kind from all contact transference of heat. By radiation we mean the physical process by which heated matter imparts a portion of its own heat to other matter of a lower temperature, but not in contact with it.

To discuss the theories as to the medium and manner of radiation would be somewhat beyond the scope of these articles, but there are various facts connected with the phenomenon of radiation which are important in their bearing on the practical question of the warming of buildings.

First amongst these, from our point of view, is the difference between the radiation from luminous and obscure sources of heat, for a knowledge of which we are indebted to the investigations of Professor Tyndall. By luminous sources of heat are meant those heat-giving bodies which are in a state of incandescence, and therefore light-giving, such as the sun, open fires, gas, &c. Obscure sources of heat are those which do not give off light as well as heat, to which class belong the hot-water and steam pipes we are wont to employ. It may also be noted that from luminous sources there are obscure heat-rays as well as luminous. This to us is only important because the rays from obscure sources of heat are inferior, in point of intensity, to the obscure rays from a luminous source.

The most important difference to us, practically, between the heat from luminous and obscure sources is that the radiation from the former is vastly more powerful than from the latter.

Another important point is the variation in the diathermancy of different atmospheres to the heat radiation from the two classes of luminous and obscure sources of heat.

Atmospheric air is diathermanous, though not perfectly so,—that is, it admits of the passage of heat through it by radiation, without becoming itself raised in temperature.

Now, water and water vapour are highly opaque or adiathermanous to all radiation from obscure sources of heat.

Hence, in an atmosphere of a high degree of humidity the preponderance of efficiency in favour of luminous sources of heat is considerably greater than in the case of drier atmospheres.

We have frequently all of us heard scornful remarks on the extravagance of our English open fireplace as compared with the more economical hot-water pipes and stoves of America and Germany.

But the researches of Tyndall show us that the Englishman's instinctive preference and love for his open fire has a sound scientific basis. In our moist atmosphere, with its average 75 per cent. of humidity, the open fireplace, with its luminous heat-rays, is far less wasteful as compared with the hot pipes or close stoves than it would be in the drier atmosphere of Germany, with an average of 50 per cent. humidity, and still less by comparison with the dry atmosphere of America, with 30 per cent. humidity.

In the practical application of heated pipes or close stoves, we are, therefore, at a disadvantage as compared with our Continental or American *cnfriires*, and it would be unsafe to rely upon their experience for data as to the requisite amount of heating surface for any particular purpose.

Another universal law affecting the radiation of heat is of high importance in determining the form of our heating agents. This is the law of inverse squares, which may be thus stated: the intensity at different distances from the source of radiation is inversely proportional to the square of the distance.

This law prevents our utilising open fires for rooms of large size, and we are therefore driven to the employment of hot pipes for the sake of the convenient distribution of heat-sources of which they admit.

We have now to consider the phenomenon of conductivity of matter in regard to heat. This is of a twofold nature. First, absolute or calorimetric conductivity; second, thermometric conductivity or diffusivity.

As an example of the difference between these, we may instance the different effects that would be produced in the following experiment:—If two bars of different metal, but of the same size and shape, and having an exactly similar surface, are placed end to end, and to their under surfaces small wooden balls are attached by wax, at equal distances along the length of the bars; then if heat is applied at the contiguous ends of the bars, the balls will drop off in succession. The first ball will drop off directly the temperature of the point at which it is attached becomes equal to the melting point of wax, and provided the distance of this point from the source of heat be not too great, the time required for this to take place depends on the diffusivity of the material of the bar. The balls will begin to drop off first from the bar which has the greater diffusivity but the greater number of balls will ultimately drop off from the bar which has the greater absolute conductivity, because the greater the flow of heat along the bar, the further will the rise of temperature necessary to melt the wax be transmitted.

The diffusivity of materials is sometimes spoken of as their specific heat, which may be defined as the amount of heat necessary to raise the temperature of a solid or liquid body a certain number of degrees, and as water is a substance of great specific heat, the unit of heat is taken in England as the amount necessary to raise by 1 deg. the temperature of 1 lb. of water at 32 deg. Fahr., that is, from 32 deg. to 33 deg. Fahr. What is known as the C.G.S. unit is better recognised in scientific circles for the measurement of absolute conductivity. This is the amount of heat flowing in one second through one square centimètre of a plate one centimètre thick, having a difference of one degree Centigrade between the temperature of its faces. The co-efficient by which the product of these factors must be multiplied for the amount of heat for any particular substance is the measure of the conductivity of that substance.

From the varying power of different substances in respect of absolute conductivity and diffusivity results their varying suitability for the environment and structure of heating apparatus. A substance of great specific heat attains its maximum temperature, or what is called the permanent state, more slowly than one of less specific heat, but, on the other hand, is able to convey a larger amount of heat.

Thus water is a liquid of high specific heat as compared with other liquids, such as alcohol or oil, for example; therefore, water is a more suitable fluid than these others for the transmission of heat in pipes.

Again, cast-iron is a material both of higher specific heat and higher absolute conductivity than wrought-iron; therefore, other considerations not being taken into account, cast-iron is more suitable than wrought-iron for the pipes to enclose the hot water.

The conductivity, whether absolute or thermometric, of various materials is an important factor in the deperdition or loss of heat which occurs from the brick or other channels in which heated pipes may be enclosed, or from the construction of the environment of the heated space.

The ideal environment would be composed of materials of small absolute conductivity as well as low thermometric conductivity or diffusivity.

Thus brick is, in both kinds, of less conductivity than stone; hence, brick walls are less wasteful of heat than stone, and render it easier to warm a brick building than a stone one.

It must not be taken for granted that a material of low absolute conductivity is also of low diffusivity. Thus, water is a case in point; its absolute conductivity is very low, but its diffusivity is very high.

Again, wood, though of lower absolute conductivity than brick in the proportion of about 1 to 4, has a diffusivity of about four times that of brick. This explains why wood is apt to become charred by prolonged exposure to a heat which at first is insufficient to produce that effect. This phenomenon is frequently noticed in the case of wood placed in too close proximity to hot-water pipes, and in the case of boarding and timbers which have been covered by copper roofs for a long period, and have frequently been found charred to a considerable depth, merely by the heat of the sun in our own country.

The deperdition of heat is a factor which forms an important item in the determination of the necessary amount of heating power which should be supplied for the warming of any particular building, and this we shall have to take into account.

OBITUARY.

MR. EDWIN LONG, R.A., died at his house in Netherhall-gardens, Hampstead, on the 15th inst. from pneumonia following an attack of influenza. He was born in 1839, and was elected an Academician in 1881. He at first confined himself to portrait-painting, and never entirely gave up this branch of art, but he is best known as a painter of scenes intended to be illustrative of Oriental and Classical antiquity. Among his pictures may be named the "Babylonian Marriage Market," painted in 1875, and followed two years afterwards by the "Egyptian Feast." Among Mr. Long's later works should be mentioned "Anno Domini," which was exhibited in 1883; "Diana or Christ," in 1881; and "Pharaoh's Daughter," in 1886.

MR. THOMAS COLLIER, R.I., a well-known landscape-painter, who died last week at Hampstead, had (says the *Times*) been ill for nearly a year after undergoing an operation in the summer of 1890. Born in Derbyshire in 1840, he showed a natural taste for drawing early in life, and studied at the Manchester School of Art. His work was mostly in water-colour. He was for many years a member of the Royal Institute of Painters in Water-Colours. Last year a collection of his paintings was exhibited by the Birmingham Society of Fine Arts, and a similar exhibition was being arranged for this season by the Fine Art Society in Bond-street.

MR. C. E. BRUTON, A.R.I.B.A.—The *R.I.B.A. Journal* records the death of Mr. C. E. Bruton on the 1st inst. He was the son of Mr. E. G. Bruton, F.S.A., F.R.I.B.A., of Oxford, who has been a member of the Institute since 1855. He was born in 1866, and, having been educated at All Saints' School, Bloxham, served his articles with his father. In November, 1889, he passed the Examination in Architecture, and was elected an Associate on January 13 last.

MR. CHARLES P. PRITCHETT.—The *Leeds Mercury* of Tuesday last records the death of Mr. Charles P. Pritchett, formerly a well-known and respected architect in Huddersfield, and junior partner in the firm of Pritchett & Son, formerly of York. They were the architects of Huddersfield College and of the Huddersfield Railway-station.

M. DECK.—The Paris correspondent of the *Times*, in reporting that the head of the pottery establishment at Sèvres, M. Deck, died on Saturday last of congestion of the lungs, writes:—"It was owing to his activity and that of M. Parvillee that the famous establishment at Sèvres recovered its *prestige* at a time when it seemed to be fast losing its distinction as the home of originality in the ceramic art. M. Deck had risen to his high office from the position of a common journeyman. His main interest always was rather in earthenware than in the more refined forms of porcelain and china, but the beauty of his famous turquoise blue and the ease with which he secured a number of other

delicate and limpid tones have given him a renown among collectors of faïence which is likely to perpetuate his name. He was born in Alsace in 1823. Arrived in Paris after travel and work in Germany and Austria, he studied in the *atelier* of the sculptor Friederich."

GENERAL BUILDING NEWS.

THE PROPOSED BELL-TOWER FOR ST. MICHAEL'S COVENTRY.—The *Coventry Herald* of the 15th inst. refers to the fact that in November last the three assessors—Mr. Ewan Christian, Mr. R. Norman Shaw, and Mr. Alfred Waterhouse—whom Mr. George Woodcock consulted in reference to the question of a bell-tower for St. Michael's, reported in favour of the project. They expressed an opinion that to throw the preparation of designs open to competition would be undesirable, and that the views of those interested would be best served by entrusting the work to an architect of undoubted ability and experience. Upon the recommendation of the assessors, Messrs. Paley & Austin, architects, Lancaster, were entrusted with the preparation of the design, which was received last week and exhibited at the King's Head Hotel for the inspection of the vicar (Rev. Dr. Mills), the churchwardens, and others. The site of the campanile is that recommended by the assessors immediately on the north side of the avenue traversing the churchyard from east to west, and opposite the two western windows in the north wall of the Chapel of St. Lawrence. According to the *Herald*, the tower will be connected with the church by a low porch or groined corridor extending across the avenue, over which it will be arched, thus not only connecting the tower with the church, but giving the church an additional entrance. This, in the opinion of the assessors, is a matter of considerable importance from the point of view of public safety. The position of the tower itself is such as to enable the designers to impart a character of solidity to its base such as the assessors held to be an element of primary importance in respect of the beauty, strength, and dignity of a structure devoted to the purpose of carrying bells. The upper part is much more ornamental than the lower, possessing a grace and delicacy of design which harmonises perfectly with the existing towers of St. Michael's and Holy Trinity. The base of the tower is 50 ft. square, including the buttresses, and the interior forms a square of 22 ft. sides. The walls in the lower stages will be 7 ft. thick. The height of the tower to the battlements will be 137 ft.—6 in. higher than the battlements of the present tower. Above the battlements at the corners, pinnacles, 30 ft. high, will be placed, and from the centre of the roof will spring a spire 50 ft. higher than the battlements. The tower will be divided into five stages. On the ground-floor will be an assembly-hall; the second stage will serve as a Vestry or Chapter-room; the third will be the ringers' room; the fourth is for the accommodation of the clock; and the uppermost stage will carry the bells at about their old level from the ground. The turret staircase by which to reach the various stages will be at the south-east corner, and there will be an entrance to the assembly-hall on the ground-floor near the south-west corner of the structure. The walls of the lower stage will only be pierced by six small square-headed windows, two on each of the exposed, or east, west, and north faces of the tower. The windows in the next stage are on the east and west sides, and in the ringers' chamber on the north and south sides. At this altitude statues will be placed in niches similar to those on the old tower. The clock-room will be lighted by two windows on each of the four sides, and, although it is below the bell-chamber, the clock-face will be placed almost at the top of the tower, immediately below the battlements. The tower will be built probably of Runcorn stone, in keeping with the present building. It is proposed shortly to exhibit the drawings at St. Mary's Hall or the Free Library for public inspection, and afterwards to call a meeting of the citizens with a view to raising 5,000*l.* to ensure Mr. Woodcock's offer to contribute the remainder of the cost.

NEW ROMAN CATHOLIC CHURCH AT CARLISLE.—On the 18th inst. the foundation stone of a new Roman Catholic Church, which is to be built in Warwick-square, Carlisle, at a cost of 10,000*l.*, was laid by the Bishop of Hexham and Newcastle. The architects of the new church are Messrs. Dunn, Hansom, and Dunn, of Newcastle-on-Tyne.

CONSECRATION OF ST. SAVIOUR'S CHURCH, OXTON.—The new parish church of St. Saviour's, Oxton, was consecrated on the 7th inst. by the Bishop of Chester (Dr. Jayne). The church, which is situated on the site of the former edifice, will accommodate about 800 persons. The necessary additional land was given by the Earl of Shrewsbury, the lord of the manor. The church is cruciform in plan, but differs from the conventional arrangement. The aisles serve as ambulatories, whilst the nave, being of unusual width, enables the congregation to see and hear the services without any obstruction of columns. The length of the church from east to west is 141 ft., across the transepts 68 ft., and the nave roof rises to a height of 57 ft. from the floor. The south transept will serve as a morning chapel. A parish-room is provided in the basement. The exterior is of Frankby stone, and the architectural features of red Runcorn stone, designed in the Early Decorative style, whilst the interior is lined with red Ruabon brick. The general contractor for the building was Mr. John Thomas, of Birkenhead, and the cost of the structure is estimated at between 10,000*l.* and 11,000*l.* The architects were Mr. C. W. Harvey and Messrs. Pennington & Bridgen, of Liverpool and Manchester.

NEW CHURCH, ST. MARY AT PONTYRHYL.—The memorial stone of the new church to be dedicated to St. Mary at Pontyrhyl, was laid on the 11th inst. by Miss Talbot, of Margam Abbey. The building will consist of nave, 51 ft. by 27 ft. 9 in., and chancel, 17 ft. by 13 ft., both under one roof, but divided internally by an arched open timber-screen, which is continued on the north and south sides of the chancel behind the choir seats, forming a vestry and organ-chamber. Above the communion rail is a lofty stone arch, dividing the chancel from the sacristy, which is 13 ft. wide by 9 ft. 6 in. deep, containing the altar table on a raised stone floor. The sacristy floor and that of the chancel will be tiled, as will be that of the passage in the centre of the nave, the floors of the vestry and organ-chamber being of wood-block. The whole of the church will be warmed by hot air on Porritt's system. The church is being built of local stone, the dressings being of Doulting stone, supplied ready for fixing by Messrs. Charles Trask & Sons, of Shepton Mallet. The pulpit and font will also be of the same material. The style of architecture is plain Early English, the windows, of lancet shape, being filled in with square leaded lights and cathedral glass. The building will accommodate a congregation of 260, and the estimated cost is about 1,200*l.* Mr. Hall is the builder, and Messrs. Bruton and Williams, of Cardiff, are the architects.

ALTERATIONS, HOLSWORTHY WESLEYAN CHAPEL. Alterations have just been made to Holsworthy Wesleyan Chapel, Devon, to increase the sitting accommodation. The alterations, which have been carried out by Mr. W. Wiffen, contractor, Holsworthy, include the removal of the old gallery and the erection of a new one extending nearly around the chapel. The front of the gallery is of open panel pitch-pine work. The entrance to the gallery will be from the vestry, in a portion of which has been built a staircase and lavatory; and the old two pairs of stairs which were at the back of the chapel have been removed, and the space thrown into the body of the chapel. The interior of the chapel has been renovated, and at the south-west end a new two-light tinted cathedral glass window has replaced the old one. Mr. A. Lauder, of Barnstaple, was the architect. The old pulpit is to be replaced by a new rostrum in the centre of the arch at the west end.

NEW MARKET FOR CARDIFF.—On the 8th inst., a new market, situate in St. Mary-street, Cardiff, and which has been erected at a cost of about 16,000*l.*, was formally opened by the Mayoress (the Marchioness of Bute). The new market in St. Mary-street occupies the site of the old market, with the space upon which stood the old police-station, the entire site covered being about 2,600 square yards. This site is of irregular shape, and within its area a rectangular hall has been constructed 200 ft. long and 81 ft. wide, the spaces between the sides of the hall and the adjoining properties being occupied by shops of varying depth, so that the space left for the public is square. This forms the general market, the space at the Trinity-street end (87 ft. by 28 ft.) being utilised for a fish market. The larger market is divided by four main avenues, forming a central block of shops and two double rows of stalls. The main avenues are divided by two cross avenues. Around the main walls of the building are lock-up shops. Encircling the building, and 14 ft. from the ground floor, is a gallery, 7 ft. wide, approached by a double staircase. The inner sides of this gallery are occupied by fifty-three lock-up shops. In the centre of the market is a raised office for the market inspector. The height of the roof is 53 ft., in the centre being a raised lantern light. The principals and purlins of the roof are of light lattice girders, the principals being trussed with wrought-iron struts and steel bar ties. The feet of the principals rest on wrought-iron stanchions, and are connected to them by wrought-iron spandrel brattices with ornamental fittings. A level gangway, outside, runs the full length of the main roof on each side to the rise of the lantern. From this all the windows in the roof can be opened, and it also gives access to the swinging vertical lights in the lantern, thus forming an exit for the air. Fresh air inlets are provided by the insertion of circular sashes in the windows encircling the market immediately over the gallery shops. The paving of the main market is executed in adamantine concrete, supplied and laid down by Mr. Hartnell, of Cardiff. The highest part of the floor is at the central aisle, from which there is a fall to either side of 6 in., channels, with movable covers, being inserted and connected at intervals with the drains. A lift to the gallery is in course of construction. This will be worked by hydraulic engines. The lift will be supplied by Messrs. R. Waygood & Co., of London. In the fish market, which is placed facing Trinity-street, there is accommodation for thirty stalls, fitted with marble slabs, all the work in connexion with which has been executed by Messrs. Corfield & Morgan, of Cardiff. This portion of the market is under a separate roof of three spans. The façade of the fish market has three stone pediments corresponding with the three gables on the roof. The central archway to the Trinity-street entrance is 17 ft. 6 in. wide. The contractor for the masonry work, &c., was Mr. James Allen, of Cardiff, whose contract amounted to 8,449*l.* Messrs. Handyside & Co., of Derby, were the contractors for the ironwork, their contract being 7,230*l.* Messrs. Morgan & Williams, of Cardiff, did the greater portion of the wrought-iron balustrades to the staircases. The architect for the building was Mr. Harpur, Borough Engineer, and the work was carried out under Mr. J. Morris, Clerk of the Works.

PRIMITIVE METHODIST CHURCH, SKELMERSDALE.—On the 16th inst. the memorial-stones of a Primitive Methodist Church and schoolroom were laid on a site in High-street, Skelmersdale, Lancashire. The church is to seat 230 persons, and is to cost about 1,200*l.* The contractor for the work is Mr. William Riding, of Ormskirk, and the architect is Mr. Richard Owen, Liverpool.

NEW INSTITUTE FOR THE TYNESIDE GEOGRAPHICAL SOCIETY.—What was formerly the Presbyterian Chapel, Barras Bridge, has been converted into an Institute for the Tyneside Geographical Society, and has just been opened by Sir Mountstuart E. Grant Duff. On each side of the vestibule there is a cloak-room. In the centre have been placed a pair of glass doors by which access to the hall is obtained. There are also doors leading from the cloak-room direct into the hall. The chapel seats have been removed and their places taken by chairs. The pulpit has given place to a platform, on each side of which there is a small ante-room, which will be used when the hall is let for balls or entertainments. The floor will seat 300 persons, while the gallery will accommodate 400 more. The seating of the gallery has not been materially interfered with, but in the centre, a place has been fitted up for the lantern and the operator. The walls of the hall have been covered with paper, while the other parts have been painted. At the back of the hall are two rooms. The larger of these apartments is to be used as the library, while the smaller one will be the office of the secretary. The building is lighted with gas and electricity. The general contractor has been Mr. James Lunn, builder, of Newcastle; Messrs. Henry Walker & Son have done the plumbing work and electric lighting.

NEW PRESBYTERIAN CHAPEL, EBBW VALE.—On the 11th inst. two memorial-stones of a new chapel for the Presbyterians of Willow Town, Ebbw Vale, were laid. The new chapel will cost 1,500*l.* Mr. W. S. Williams, Tredegar, is the architect, and Mr. Walter Morgan, Ebbw Vale, is the builder.

WESLEYAN SUNDAY SCHOOLS, PENRYN.—Memorial-stones of the new Wesleyan Sunday-school premises, Penryn, Cornwall, were laid on Whit-Monday by Mrs. Tobin, of Liverpool, and Miss Silcox, of Falmouth. Mr. Carkeek, of Redruth, is the contractor. Mr. J. Wm. Trounson, of Penzance, is the architect.

RESTORATION OF HARLAXTON CHURCH, NEAR GRANTHAM.—On the 12th inst., the Church of St. Mary and St. Peter, at Harlaxton, near Grantham, was opened, after restoration. The work of restoration has been carried out by Messrs. Rudd & Son, Grantham, under the direction of Mr. J. O. Scott, F.S.A.

NEW WELSH PRESBYTERIAN CHURCH, RUTHIN.—The new Welsh Presbyterian Church situate in Well-street, Ruthin, was opened on the 24th ult. The building occupies a commanding site, and is of Gothic design. The front portion of the Church is semi-circular on plan, and measures internally 55 ft. by 54 ft. Accommodation is provided for 550 persons. The sittings are arranged in circular-gallery form, with stepped aisles leading to the body sittings. A schoolroom is constructed at the rear and measures 41 ft. 6 in. by 24 ft., having minister's vestry, lavatory, and conveniences adjoining. A large room 54 ft. by 24 ft. forms an upper schoolroom over. One of the principal features of the Well-street elevation is a stone spirelet which springs from the square from the top of a large buttress, and rises in elegant octagonal form a considerable distance above the apex of the pediment roof, having an intermediate support from a flying buttress that springs from one of the pyramidal porch roofs. The height of the spirelet from the ground level is 70 ft. Arched windows and weathered offset buttressess are placed at regular intervals in the church walls. The side elevations are divided by flat arched-headed windows, having triplet mullioned frames placed therein. A pediment is also formed having mullioned traceries and cusped windows, and slate louvres formed with stone jambs in the apex. The buttresses, canopies, string courses, hood moulds, and all the dressings are of lime-stone. The main walls are constructed of stone from Wdfyyd quarry. The roof is semi-conical, and is intersected with the main pediment roofs. All the roofs are covered with Bangor slates and red ridge tiles. The interior of the building is fitted up with pitch pine. Wall-boarding is fixed

around the walls, and the principal timbers of the roof are exposed, and are dressed and varnished. In the four bays of the ceiling, ventilating perforated doors are connected to air-shafts that are attached to a Boyle's "Patent Air Extractor." The pulpit is of elaborate design, and has a deacon's pew in front and a decorated canopy behind. The seats are fixed in an isaacoustic curve from the pulpit. The joinery work was done by Messrs. Jno. Owen & Co., of Liverpool. The heating apparatus was fixed by Messrs. Minshull, of Oswestry, and the glazing of the windows, which are of cathedral lead lights, was executed by Messrs. Hackland & Co., of Birkenhead. The architect is Mr. T. G. Williams, of Liverpool.

"NEW BANK PREMISES, MANCHESTER."—In our issue of 9th inst., p. 378, we gave a description of the new bank premises at Manchester, for the National Provincial Bank of England. We are asked to add that the passenger-lift therein referred to was made and erected by Messrs. R. Waygood & Co.

SANITARY AND ENGINEERING NEWS.

THE LONDON WATER SUPPLY BILLS.—Before adjourning for the Whitsuntide Recess, the Select Committee of the House of Commons upon the various London Water Bills dealt with a Bill promoted by the Southwark and Vauxhall Company, interrupting the consideration of the "London Water Supply" Bill for that purpose. With the main question before the Committee this Bill had no connexion, and it involved no question of principle, its object being to authorise certain capital expenditure required for circumstances of special urgency. In 1886 the Company obtained power to raise 300,000*l.* for works then necessary, and at the beginning of the present year 224,000*l.* of that amount had been spent. But the company had a rapidly-increasing district and growing demands for extensions. They are, however, at the end of their means. Among the works they wish to carry out are an enlargement of the filtering area at Hampton, which has been frequently urged upon them by the Local Government Board, and an expenditure of 100,000*l.* on the construction of three additional reservoirs at Nunhead. The company at present supply between 25,000,000 and 26,000,000 gals. of water per day derived from percolation through the gravel, and from the Thames at Hampton. The new Bill proposes to empower the company to raise any additional capital, not exceeding in the whole 300,000*l.*, by the creation and issue of debenture stock, and to attach to such stock any fixed and perpetual interest not exceeding the rate of 4 per cent. per annum. The proposed work at Hampton will cost about 33,000*l.*, and that at Nunhead about 100,000*l.*; and the company have sunk a well in the chalk at Streatham from which they hope to draw something like 4,000,000 gallons of the purest water daily. For the completion of that extension they also require further capital, and likewise for increased engine-power and some other purposes. The London County Council opposed the Bill to some extent, on questions connected with the sufficiency of the company's present works, and the necessity for raising the whole of the proposed additional capital; but after a brief consideration of the measure, and the examination of a few witnesses, the Committee passed the Bill, inserting, however, a new clause, brought up by the promoters on the suggestion of the Committee, providing that—"Of the moneys raised under the powers of this Act, 30,000*l.* shall be applicable only to the purpose of providing additional filtration; 85,000*l.* shall be applicable only for the purpose of providing additional reservoirs at Nunhead; 40,000*l.* shall be applicable only for the purpose of providing additional engines; 30,000*l.* shall be applicable only for the purpose of the Completion of the works at Streatham; 20,000*l.* shall be applicable only for the purpose of the completion of the high-pressure service; 40,000*l.* shall be applicable for the purpose of the extension of mains and services; and the balance may be applied to any of the above purposes, or the general purposes of the undertaking to which capital is properly applicable." The balance will probably be about 55,000*l.*, and the County Council objected to leaving so large an amount to the free manipulation of the company, but their contention was not allowed, and the Bill was eventually approved and reported to the House.

NEW BRIDGE OVER THE CLYDE AT GLASGOW.—The new Dalmarnock Bridge, at the end of Dalmarnock-road, Glasgow, was formally opened for traffic on the 6th inst. The bridge is a steel girder bridge of five spans, each of 54 ft. 8 in., resting on masonary piers and abutments. In its construction some difficulty was experienced with the foundations, the bed of the river being composed of muddy olay and sand, necessitating the sinking by the pneumatic method of caissons 63 ft. long and 9 ft. broad. The piers are finished with a granite impost from Ben Cruachan Quarry, while the superstructure consists of steel girders, cross girders, and buckled plates. There is a flooring of steel plates over the cross girders, and on these plates the roadway and footway are laid. The width between the parapets is 50 ft., and the roadway is 32 ft. broad, leaving 9 ft. on either side for footpaths. The outside girders have an ornamental *facia*, and are finished with an ornamental cast-iron parapet. Messrs. Crouch & Hogg, C.E., Glasgow, were the engineers of the bridge, and the contractor was Mr. A. H. Boyle, of Banknock, Bonnybridge. The entire cost of the bridge is 28,330*l.*

NEW PIER, DEVONPORT.—On the 15th inst. Lord St. Levan, Mayor of Devonport, opened the new pier at Mutton Cove, which the Corporation have erected at a cost of nearly 2,000*l.* The pier was designed by Mr. J. C. Inglis, C.E., and constructed by Mr. A. R. Debnam.

STAINED GLASS AND DECORATION.

WINDOW, PARISH CHURCH, CASTLE BROMWICH.—The chancel window of the Parish Church, Castle Bromwich, has just been filled with stained-glass. The subject depicted is the Saviour as the King of Heaven, surrounded by the celestial choir, and the whole of the upper portion of the window is occupied by the illustration. The work has been executed by Mr. S. Evans, of West Smethwick.

WOODFORD PARISH CHURCH.—The large east window of the new chancel of Woodford parish church has recently been filled with painted glass as a memorial to Mr. and Mrs. Knowles. The subjects illustrated are "The Annunciation," "Mary anointing Our Lord's feet," "Our Lord appearing to Mary in the garden," "Our Lord in the house of Martha and Mary,' and "The Marys at the tomb." The ornamental surroundings are treated strictly in character with the Perpendicular architecture of the church. The artists are Messrs. Chas. Evans & Co., of London.

EMMANUEL CHURCH, LEEDS.—Stained glass has been inserted into one of the three-light aisle windows by way of memorial to the late Mr. Joseph Woodhead and his wife. The window, which is one of a series intended to illustrate the principal events in the life of our Saviour, contains the Nativity, the adoration of the Magi, and Christ in the Temple. Messrs. Powell Bros., of Park-square, Leeds, are the artists.

WOODLESFORD CHURCH, YORK.—It is proposed to fill the transept windows of Woodlesford Church, Yorks, with stained glass in memory of the late Mr. Henry Bentley and his wife. The work is in the hands of Messrs. Powell Bros., of Leeds, whose designs for the whole have been accepted.

WINDOW, TRURO CATHEDRAL.—The two lights on the south side of the retro-choir of Truro Cathedral have just been filled with stained glass. These windows are the gift of members of the Bolitho family. In the first light is represented St. Peter, accompanied by St. James-the-Greater and St. Mark. In the second light the principal figure is that of St. James-the-Less, Bishop of Jerusalem, vested in high priestly robes, and accompanied by St. Matthew and St. Thomas. The work has been carried out by Messrs. Clayton & Bell, of London.

FOREIGN AND COLONIAL.

FRANCE.—The Municipal Council of Lyons, the native town of Meissonier, has given the name of the painter to what has hitherto been the "Place St. Pierre."——Early in June the Minister of Public Works will proceed to Aurillac to open a new Lycée, a barracks, and a new railway line from Aurillac to St. Denis.——A new municipal museum has recently been inaugurated at Cette, by M. Roger Ballu, Inspecteur des Beaux-Arts.——There has just been cast in bronze, at the Paccard foundry, a large clock intended for the Sacré Cœur church at Montmartre.——A "Prix de Paris" has been founded in favour of young American artists, on the model of the "Prix de Rome." It is initiated by an American, M. Chanter, who has resided a long time in Paris, who has already founded the same prize for New York and Boston. At the request of M. Chanler, Messrs. Bonnat, Puvis de Chavannes, Carolus-Duran, Gérôme, Drgnan-Bouveret, and Benjamin-Constant have been constituted a committee to conduct the studies of the American "laureats" and classify them in order of merit.——Last Saturday M. Larroumet was duly elected to the Académie des Beaux-Arts in the place of the late Prince Napoléon.——The Municipal Council of Paris has authorised the Arts Club of Rotterdam to organise an exhibition of the works of Dutch artists in the Ville de Paris Pavilion, to be open from November 15 to the end of the year.——The "Union Syndicate des Architectes Français" is organising an exhibition of the works of MM. Laisné, Millet, and Ruprich Robert, which will open at the commencement of June at the Cercle de la Librairie, Boulevard St. Germain.——A new square is being formed in Paris around the Musée Galliera.——The Salon of the Champs Elysées (the old Salon, will be closed on Sunday and Monday next for the voting of the jury of awards.——The "Salon des Refusés" will open at the Palais des Arts Libéraux on the 29th, to close on June 30.——The death is announced of M. Joseph Auguste Lafollye, Government architect. He had received medals in the Salons of 1868, 1870, and 1872, and obtained a medal of the first class in the Exhibition of 1878.——We have also to announce the death of M. Théodore Deck, director of the Manufacture Nationale de Sèvres. M. Deck was born in Alsace in 1823. He was well known for his works on ceramic art, and had received many official honours.——The new Lycée Voltaire at Paris will be opened on July 14, on the occasion of the national fête.

NORWAY.—Of late years, as we have noted from time to time, considerable agitation has been on foot among Norwegian architects respecting the manner in which competitions for public buildings are carried out. It is maintained that no such rules as those observed in other countries are followed, and now another glaring instance is drawn attention to by the *Teknick Ugeblad*, the organ of the Norwegian Association of Architects, respecting the competition for a new church to be built, with public funds, in Hammerfest, burned down last year. In the official programme for the competition there is no mention whatever of either style, shape, position, or construction, nor of the number of designs required, their scale, time of delivery, or names of jury, nor are any prizes offered. Indeed, there is not even an invitation to native *architects* to compete. Any one who thinks himself able to do so is asked to send in designs! In consequence, the leading architectural organ calls upon members of the profession neither to compete in this nor similar competitions, and there is no doubt this suggestion will be acted upon.

DENMARK.—The Catholics of Copenhagen, who recently erected a great Catholic hospital, St. Joseph's, with chapel attached, are making arrangements for building two new churches in the Danish capital. An influential company has been constituted at Copenhagen for the construction of the new great "free" harbour there. The capital is 222,000*l.* The director has proceeded to Hamburg, Bremen, and Antwerp, in order to study the new dockworks in those cities.

SWEDEN.—The Swedish Export Association, established some years ago, and which has since done a great deal towards the introduction of Swedish manufacturers abroad, is establishing a sample office of such in London, similar to those already existing in some other cities. The Swedish Government supports the enterprise with a sum of 700*l.*——Prince Eugen, youngest son of King Oscar, and an amateur painter of high standing, has accepted the presidency of the Scandinavian Exhibition of Arts and Manufactures to be held in Gothenburg this summer. A congress of Scandinavian engineers, architects, manufacturers, electricians, &c., will be held in connexion with the Exhibition.——The builder of a house in Stockholm has been fined a sum of 150*k.* under the new Building Act for having stuccoed two houses erected by him, six months not having elapsed since such erection, and ordered to remove the material.——A great meeting has been held in Stockholm of men engaged in the building trades, at which it was resolved that between April 1 and October 1 the hours of no one in the trade should exceed ten a day, with two hours' rest. It is, however, doubtful whether the masters will agree to this.——New gasworks are to be constructed in the town of Gefle, at a cost of 5,500*l.*, as well as a new harbour.——The Stockholm Sanitary Board has appointed a committee to consider whether some fireplace could not be invented—simple and inexpensive,—to prevent the production of smoke, as of late years the smoke nuisance in the Swedish capital has become greater and greater.

MISCELLANEOUS.

THE GOULBURN MEMORIAL PULPIT, NORWICH CATHEDRAL.—On the 14th inst. the new pulpit which has been erected in the choir of Norwich Cathedral as a memorial of work of the late Dean, Dr. Goulburn, was used for the first time. The new pulpit, which is placed on the north side of the choir, is of carved oak. It has been designed by Mr. J. P. Seddon, F.R.I.B.A., of London. It is sexagon in plan, and stands 7 ft 9 in. in height. The floor of the new rostrum is 3 ft. 3 in. above the level of the cathedral floor, and is approached by a staircase from the east side. The type of architecture is Decorated. Standing in the centre of an embattled base is a central shaft, carrying the main portion of the weight above, and at the angles are six shafts, surmounted by crocketted ogee arches. The broad band of carving that surrounds the base of the pulpit immediately above this is a conventional representation of the vine and grapes. On each cant of the body of the pulpit are recessed and canopied niches. The latter are of ogee plan, and are groined and richly crocketted. In the spandrels between their heads is much richly-carved foliage, and the figures of angels with wide-spread wings and hands in the attitude of adoration. The book-rest is borne on the shoulders of an angel. The upper cornice is segregated and embattled. The statuettes are carved almost in the round. The two niches facing the column due north, and which can hardly be seen in consequence of the adjacent old masonry, are empty. The other eight are all filled. In the central niches respectively are representations of the four Evangelists, St. Matthew holding a T-square (emblematic of his original avocation as a carpenter), St. Mark and St. Luke, with pens, a book, and scroll, and St. John, long-haired and beardless, holding a book in one hand and a chalice

in the other, out of which is issuing an evil spirit. Next to St. John is St. Paul, a grave, bearded man, leaning upon a long sword. Occupying the angle niche by the entrance to the pulpit and against the stairs is a statue of St. James the Bishop (or as he is more generally known St. James the Less). Flanking the Evangelists on the north side are SS. Stephen & Peter. The handrail of the staircase is supported by clustered columns, carrying a continuous arcading of double ogee heads, cusped and crockotted, whilst the lower newel is surmounted by a sculptured representation of a kneeling angel. The work has been executed by Mr. Harry Hems, of Exeter. The pulpit has been placed *in situ* by members of Mr. Hems's staff. Sad to say, one of them (Mr. Mark Brock, a trusted member of Mr. Hems's staff for the last twenty years) was stricken down in Norwich on the 11th inst. by influenza, and was removed to the hospital, where he succumbed on the 13th inst.

THE ENGLISH IRON TRADE.—The holidays and the continued speculation in warrants have totally prevented business of any magnitude in the English iron market. Scotch warrants have been driven up excessively in price during the past few days, and the "Bears" have been completely cornered. On a falling market the abnormal rise in warrants is doing a great deal of harm to legitimate trade; but the present condition of things cannot be expected to last much longer. Scotch makers' iron, though quiet in tone, has advanced in sympathy with the warrant market, most brands being 6d. to 1s. higher, whilst Carnbroe is quoted at an advance of 4s. on the week. Middlesbrough pig has risen to 42s., or 2s. 9d. above last week's quotation, on account of the increased price demanded for Cleveland warrants. Bessemer iron has made a further advance of 2s., and is now offered at 54s. for mixed numbers of makers' iron, or the same price as hematite warrants. The quiet tone in the manufactured iron trade which has prevailed lately still continues, and there is no movement of any importance in the tin-plate market, but prices are again weaker. The steel trade continues generally in a state of inactivity, but prices have not further declined. The few fresh orders which have been given out in the shipbuilding trade are chiefly for sailing ships. In most branches of the engineering trade there is still a fair amount of work, and, owing to the colder weather, the coal trade is fairly brisk.—*Iron*.

REREDOS, PARISH CHURCH, WEST KIRBY.—The Parish Church of St. Bridget, West Kirby, Cheshire, has been provided with an oak reredos. The reredos, which is erected by the parishioners, &c., was designed by Mr. Kempe.

ROYAL METEOROLOGICAL SOCIETY.—The usual monthly meeting of this Society was held on Wednesday evening, the 20th inst., at the Institution of Civil Engineers, 25, Great George-street, Westminster, Mr. Baldwin Latham, M. Inst. C.E., F.G.S., President, in the chair. Dr. M. G. Foster, M.A., and Mr. J. Robinson, J.P., were elected Fellows of the Society. The following papers were read:—1. "On the Vertical Circulation of the Atmosphere in Relation to the Formation of Storms," by Mr. W. H. Dines, B.A., F.R. Met. Soc. After giving an outline of the circulation of the atmosphere, the author refers to the two theories which have been suggested to account for the formation of storms, viz.:—(1) The convection theory, which is that the central air rises in consequence of its greater relative warmth, this warmth being produced by the latent heat set free by condensation; and (2) the theory that the storms are circular eddies produced by the general motion of the atmosphere as a whole, just as small water eddies are formed in a flowing stream of water. The author is of opinion that the convection theory is the more probable of the two, but more information about the temperature of the upper air is greatly needed. 2. "On Brocken Spectres in a London Fog;" by Mr. A. W. Clayden, M.A., F.R.Met.Soc., F.G.S. During the dense fogs in February last, the author made a number of experiments with the view of raising his own "spectre." This he ultimately succeeded in accomplishing by placing a steady limelight a few feet behind his head, when his shadow was projected on the fog. He then made some careful measurements of the size and distance of the spectre, and also succeeded in taking some photographs of the phenomenon. 3. "An account of the 'Leste,' or hot wind of Madeira," by Dr. H. Coupland Taylor, F.R.Met.Soc. The "Leste" is a very dry and parching wind, sometimes very hot, blowing over the island from the E.N.E. or E.S.E., and corresponds to the Sirocco of Algeria, or the hot north winds from the deserts of the interior experienced in Southern Australia. During its prevalence a thin haze extends over the land, and gradually thickens out at sea until the horizon is completely hidden. It is most frequent during the months of July, August, and September, and usually lasts for about three days. Mr. Shelford Bidwell, M.A., F.R.S., exhibited an experiment showing the effect of an electrical discharge upon the condensation of steam. The shadow of a small jet of steam cast upon a white wall is, under ordinary conditions, of feeble intensity and of a neutral tint; but if the steam is electrified, the density of the shadow is at once greatly increased, and it assumes a peculiar orange-brown hue. The electrical discharge appears to promote coalescence of the exceedingly minute particles of water contained in the jet, thus forming drops large enough to obstruct the more refrangible rays of light. It is suggested that this experiment may help to explain the intense darkness, often tempered by a lurid, yellow glow, which is characteristic of thunderclouds.

DUNN'S "SESAME" CLOSET.—This is a water-closet which when in use has the same form, or nearly so, as that of the closets with lifting seat top without framing which are now coming so much into use. Its special feature is that it is capable of being folded up into a shallow recess in the wall, and closed over with folding doors. To use the closet, the doors are opened, which shows a handle marked "pull down," which turns the seat to its horizontal position (the pan and seat being



balanced). After using, it is turned up to its folding position, by which means the soil is discharged into the trap, and at the same time automatically starts the syphon cistern, which flushes the entire surface of the pan. When in its upright position, and by special arrangement, there is the full quantity of water left in the pan to receive the soil. Water-pockets in the sides of the pan catch part of the flush when the seat is turned up, and are discharged into the bottom of the pan to receive the soil when the seat is turned down. The invention seems very suitable and convenient for use in ships and wherever space is of importance; it can also be applied as a bedroom-closet for use by invalids, being entirely concealed when not in use. The patentee is Mr. W. Dunn, of Albany-street.

THE ARTISTS' BENEVOLENT FUND.—The eighty-second anniversary dinner of this fund is fixed for Saturday, the 30th inst., at Freemasons' Hall, the Duke of Fife in the chair.

SOLICITORS AND ESTATE AND HOUSE AGENTS.—"An Estate Agent" writes to the *Birmingham Daily Post*:—"I have this morning received a printed circular from a solicitor advertising properties for sale by private treaty, and pushing house-agency business. This pushing advertising system of 'Jack-of-all-trades' solicitors is a nuisance, and should certainly be taken up by the Law Society. Solicitors must nowadays be a very different class of men to those of former days if they tolerate advertising solicitors who are money-lenders, house agents, lawyers, speculative builders, and estate agents, and who require to share all commissions belonging to those with whom business brings them into contact. It is generally understood that in every business transaction where a lawyer is necessary he takes all the cream; but, if this phase of the business is to be extended, as seems likely, to lawyers taking up every other business and profession under the sun, then, of course, cream, milk, and utensil must all go to them, and they will have to dispense their charity to the rest of the starving community."

BETHNAL-GREEN HOSPITAL.—A small exhibition for the benefit of a new cot for this hospital is to be opened at Morley Hall, Regent-street. It includes Landseer's drawings of Chillingham wild cattle, and a series of sketches during "A Cruise from Cowes to Naples," by Lady Tankerville. The exhibition will be opened to-day (Saturday) at 3 p.m. by H.R.H. the Duchess of Teck.

A RAILWAY THROUGH MANIPUR.—A glance at the map would appear to show that through Manipur would probably lie the ultimately certain connexion of the Burma Railway system with that of Bengal. The precise route would, of course, be a matter for very careful investigation, and it might quite possibly turn out that a railway located transversely to the formidable series of ridges would be a commercial failure. Still, politically speaking, the advantages of such a line would be very great, and as a means of transfusing the dense and the scanty populations, its value, Imperially, would be very high indeed. A railway engineer who has had special experience in selecting routes through difficult countries ought most certainly to accompany the columns from the Tammu, and another from the Silchar direction. We hope that this will not escape the attention of Government. There will in all probability be plenty of leisure and opportunity for such a reconnaissance afterwards; but, still, the exigencies of the situation, and particularly the present position of affairs revealed by the most recent and authentic advices, may for all we can tell render it expedient that the opening up of the country by survey should be dedeferred for a later opportunity.—*Indian Engineer*.

CAPITAL AND LABOUR.

THE THREATENED LOCK-OUT OF CARPENTERS AND JOINERS IN LONDON.—As will be seen by reference to a circular issued by the Central Association of Master Builders of London, on Thursday, the full terms of which we have quoted in our first "Note" this week, there seems to be little prospect of averting the threatened lock-out on Saturday, the 23rd.

WAGES IN THE BUILDING TRADE AT SHEFFIELD.—At a meeting of the master builders of Sheffield, held at the "King's Arms Hotel," on Saturday last, they were of opinion that there was no reason to alter the standard rate of wages from 5½d. per hour, and were fully agreed to adhere to the original resolution of May 5.

LEGAL.

A LIVERPOOL LIGHT AND AIR CASE:

DICKINSON *v.* THE LIVERPOOL COLD STORAGE COMPANY.

AT the Chancery Court of the County Palatine of Lancaster, held at St. George's-hall, Liverpool, on the 6th inst., judgment was given by Vice-Chancellor Bristowe in the case of Dickinson *v.* the Liverpool Cold Storage and Ice Company. The hearing of the case had occupied the court several days.

From the facts of the case, as reported in the *Liverpool Daily Post*, it appeared that the plaintiffs were Edward Dickinson and Edward Jones, trustees for the beneficiary owners of the Opera House Tavern, 11, Williamson-square, Liverpool, and the defendants a limited liability company who had purchased the old Theatre Royal and other premises adjoining those of the plaintiffs. They had converted the places purchased into cold storage premises. Plaintiffs sought for a mandatory injunction to restrain the defendants from interfering with their ancient lights. They sought also to restrain them from removing away soil affording lateral support to their walls or property, and from cutting off or obstructing a drain passing from plaintiffs' property through the defendants' property to the public sewer in Charles-street.

On behalf of the plaintiffs it was urged that defendants were erecting a large chimney, which would, if not stopped, materially diminish the ancient light of eleven windows in plaintiffs' premises, and threatened to raise their existing building considerably higher, which would further diminish such light. The defendants gave a general denial to the plaintiffs' allegations.

The Vice-Chancellor visited the premises, and expressed the opinion that the case was eminently fitted for settlement. The parties could not, however, agree upon terms, and the case was fully gone into.

The Vice-Chancellor delivered judgment with costs in favour of the defendants on the question of drainage and excavation. On the chief point of involving the loss of ancient lights he found that defendants' high wall had distinctly interfered with the plaintiffs' light, and the chimney slightly so, and in respect of this he awarded damages in lieu of an injunction, following the decision of Mr. Justice Pearson. He gave judgment in favour of the plaintiff for 134*l.*, with costs against the defendants in this portion of the case.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Completion of Tower and Spire to Church, Rotherham	.....	.....	June 13

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Riding School, Stables, and Sheds	War Department	*Official*	May 26
*Works and Materials	West Ham Council	do.	do.
*Roadmaking Works	Lewisham Bd. of Wks.	do.	do.
Fifty-four Houses, Cilfynydd Estate, near Pontypridd	Wood Street Building Club, Cilfynydd	T. C. Wakeling	do.
Excavating and Levelling Site of Fever Hospital	Corp. of Birkenhead	T. C. Thorburn	do.
New Distillery, Glenlais, Keith	The Corporation	Gordon & MacBey	do.
Private Street Improvements, Rochester		*Official*	do.
Drainage Work, Glebe Estate, Barry	T. Morel	Phillips & Holdgate	do.
Residence at St. Andrew's, Dinas-Powis	Hackney B. of W.	Jacobs and Flockwell	May 27
*Broken Granite, Flints, &c.		J. Lovegrove	do.
House and Shop, Southmoor		J. W. Rounthwaite	do.
Primitive Methodist Oh. and Schools, Middlebro'		J. Shields	do.
Construction of 163 yds of 18 in. Pipe Sewers at Stanley	Lancaster U.R.S.A.	J. E. Parker	do.
1,100 yds. Main Sewer	Selby Local Board	T. Mallinson	do.
Parish Church, Heckmondwike		Peterson & Cowgill	do.
Cart Shed, Widnes	Widnes Local Board	J. S. Sinclair	do.
Excavating, Pitching, Sewering, Paving, Flagging, &c. Streets	do.	do.	do.
*Supply of Granite Spalls	Shoreditch Guardians	do.	do.
Intercepting Sewer, Hobbs Brook	Halifax Corporation	*Official*	do.
Earthenware Pipe Sewer, Shaw Syke	do.	do.	do.
Alterations to Kategrove-road School, Reading	Reading School Board	J. Morris	do.
Sewerage Works	Stockton-on-TeesCorp.	*Official*	May 28
Water Supply, Carlton-in-Coverdale		Redwell & Son	do.
Additions to Canonteign House, Christow, Exeter	Viscount Exmouth	W. F. Tollit	do.
Additions to "Crossways," Cowbridge	Thurston Bassett	Seward & Thomas	do.
Extension of Head Post Office, Glasgow	Com. of H.M. Works	*Official*	do.
Painting, &c. West Bromwich Workhouse Infirmary	The Guardians	T. Rollason	May 29
Alterations, &c. Presbyterian Church, Kilwaghta, Ballymoney	The Committee	Young & Mackenzie	May 30
Sewage Treatment Works at Wath upon-Dearne	Local Board	*Official*	do.
Six Villa Residences, Sowerby Bridge	Edinburgh & District Water Trustees	Lloyd & Son	do.
Cast Iron Sluices, &c. Threipmuir Reservoir	Colonel Symons	J. & A. Leslie & Reid	June 1
A Pair of Labourers' Cottages near Hatt, Cornwall	Town Council	S. P. Hoaking	do.
Lodge and Gardener's House, Beveridge Public Park, Kirkcaldy	St. Pancras Vestry	J. W. Hislop	do.
*Erection of Arc Lights, Columns for same and Road Shelters	Board of Public Works, Dublin	Henry Robinson	do.
Offices for the Mercantile Marine Service	The Committee	J. McInery	do.
Nurses' Residence, Wadsley Asylum, Sheffield		N. Macara	do.
Presbyterian Church and School, Bedlington	Kingswood Sch. Bd.	W. L. Bernard	do.
Board School, Kingswood, near Wotton-under-Edge	Hornsey Local Board	T. de Courcy Meade	do.
*Iron Fence, Manhole Covers, Step Irons, Gratings, &c.	Stockton-on-Tees Corp	K. F. Campbell	do.
*Forming and Laying-out of a Public Park			do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Re-laying Pipe Sewer	Waltham Holy Cross Local Board	C. W. Wigg	June 11
Twenty Houses, near Prudhoe	Blaydon Dist. Prov. Soc. Lins.	.....	do.
*Public Baths	Aston Manor Loc. Bd.	*Official*	do.
*Water Drain, Manholes, &c.	Mortlake Dist. Highway Board	H. Richards	June 2
*Oak Park Fencing	Battersea Burial Bd.	*Official*	do.
*Broken Granite	Braintree Local Board	do.	do.
*Four Houses with Out-buildings at Portsoy	Admiralty	do.	do.
*Erection of Stone Bridge over River Taff	Merthyr Tydfil Loc. Bd	do.	do.
*Kerbing and Drainage of Road	Leyton Local Bd.	do.	do.
*Wood Paving Works	Wandsworth B. of W.	*Official*	do.
*Painting, &c. Works	St. George's Union Guardians	H. Saxon Snell	May 30
*Repairing Roads	Borough of Croydon	*Official*	do.
*Road Works	Toxteth Park Loc. Bd.	do.	do.
*Distempering, Painting, &c.	Poplar and Stepney Sick Asylum District	G. E. Holman	do.
Unbroken Whinstone (800 tons	Great Driffield L. B.	.....	do.
Tramp Wards, Coventry Workhouse	The Guardians	G. I. Steane	do.
Glass-room and Lobby to Girls' School	North Walsham Sch. Board	Bottle & Olley	June 3
*Restoration of Parish Church, Lynton	The Committee	H. Wilson	do.
70 tons of Steel Girders, with Cast-iron Cylinders, for Bridge over River Gowy	L. & N. W. & G. W. Rys	*Official*	do.
Twenty-six Cottages, Inspector's Office, &c. near Mexborough	Manchester, Sheffield, & Lincolnshire Ry.	do.	June 4
Culvert, Sampford, Courtenay	Devon County Council	E. H. Harbottle	do.
*Wood Paving Works	Commrs. of Sewers	*Official*	June 5
Additional Buildings, Worcester Lunatic Asylum	The Committee of Visitors	H. Rowe & Son	June 6
*Sewerage Works	Atcham, E.S.A.	.....	do.
House, Wallflerton, Brixton, Devon	W. P. Vosper	.....	June 8
*School Buildings	Brecon School Board	*Official*	June 9
*Paving Hight-street, Stratford	West Ham Council	Lewis Angell	do.
Painting, &c. Warren Farm Schools, Brighton	The Guardians	.....	do
Water Supply, Woodland	Teesdale U.R.S.A.	*Official*	do.
*Works of Main Drainage	Southill Nether L. B.	[M. Paterson	June 11
Reservoir to Antony House, Torpoint		J. Haines	June 13
*Widening Howes Farm County Bridge	Middlesex C. C.	*Official*	do.
College Buildings, Belmont, Belfast	Trustees of Campbell College	W. H. Lunn	June 15
*Road Works	Hauwell Local Board	*Official*	June 16
*Sewerage Works	Tottenham Soc. Bd.	J. S. Worth	do.
*Dredging Works	Medway Conservators	*Official*	June 22
*Police Stations	Carmarthenshire County Council	do.	June 29
*Seven Houses at Carnock Wood	J. McNiece	.....	No date
*Reinstating Two Brick Chimneys	Mitcham Linoleum & Floorcloth Co.	.....	do.
*Citadel at Rochdale	Salvation Army	W. Gilbee Scott	do.
Twelve Houses and Shop, Dolly-lane, Leeds	.....	C. F. Wilkinson	do.
Hotel, Bisen Llynol, near Maesteg	.....	G. F. Lambert	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Outdoor Foreman	Borough of Longton	2*l.*	May 26
*Assistant City Engineer	Cape Town Corp	300*l.*	do.
*Assistant (Borough Engineer's)	Stockton-on-TeesCorp.	150*l.*	May 28
*Outdoor Foreman	Borough of Hanley	2*l.* 2*s.*	June 1
*Clerk of the Works	Essex County Council	.....	No date

Those marked with an Asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv., vi. *and* viii. *Public Appointments, p.* xxii.

COLLABORATION IN DESIGNING BUILDINGS:

GREEN V. ARCHER.

This was a somewhat curious action for alleged libel, and for an injunction restraining the defendant from further publishing the same. The case came before Mr. Justice Denman and a Special Jury on the 14th inst. From the report in the *Times* of the 15th inst. it appears that the plaintiff by his statement of claim alleged that from March, 1872, to October, 1889, he and the defendant carried on the profession of architects, in partnership, under the style or firm of Archer & Green; that they together designed and supervised the construction of many important buildings in London, and in particular 57, Jermyn-street, Whitehall-court, the Café Royal, Tooth's Gallery, Cambridge-gate, the Holborn Restaurant, and Albert-gate; that photographs and other representations of the buildings had been obtained by the firm before dissolution, and immediately after the dissolution the defendant falsely and maliciously wrote and published of or concerning the plaintiff in his profession as an architect in large letters at the foot of each such copy, "Designed by Thomas Archer, F.R.I.B.A., 14, Sackville-street, Piccadilly"; that the defendant caused one of the photographs to be framed and hung up in his office, and he sent a set of the photographs to each of the following persons:—Sir Nigel Kingscote (the First Commissioner of her Majesty's Woods, Forests, and Inland Revenues), Lord Rosebery, Lord Herschell, Mr. Ritchie, M.P., and Mr. Hobbs. Theinnuendo alleged was that the defendant intended falsely and maliciously to state of and concerning the plaintiff in his profession of an architect to the persons to whom the photographs were sent that the buildings were designed by him exclusively, and that the defendant had nothing whatever to do with the designing of them.

Mr. Willis, Q.C., having opened the plaintiff's case, stated that the plaintiff did not bring the action to recover damages; all he wished was that the defendant should withdraw the photographs and give an undertaking that they would no longer be produced as before, with the defendant's name alone appearing as designer.

The learned Judge intimated that something should be done by counsel to avoid a long inquiry.

Mr. M'Call, Q.C., for the defendant, said he was unable to come to terms. He had to submit that upon the opening and the pleadings there was no case. The action, if anything, was for slander of title. It was not a libel upon any individual. The statement of claim did not allege that the words were false to the defendant's knowledge, and that the plaintiff had suffered special damage.

Mr. Willis, for the plaintiff, urged that it was not an action for slander of title at all. The words were capable, in their ordinary meaning, of imputing to the plaintiff a want of skill. The words were capable of meaning that the defendant solely designed the buildings while the plaintiff and defendant were partners, and that the defendant designed the whole of the plans, and the plaintiff had nothing to do with them. Was not that a reflection upon the skill of the plaintiff?

Mr. Justice Denman said that, if he thought it was a case in which any good would be done to either party, he would have let the whole facts be investigated. But he did not think, as the action would not lie, that he ought to indulge either party, and allow them to occupy the time of the Court. He came to the conclusion that the statement of claim disclosed no cause of action, and he gave judgment for the defendant, with costs.

MEETINGS.

SATURDAY, MAY 23.

Architectural Association.—Visit to Mansions, Palace-court, South Kensington. Meet at 3 p.m.

Incorporated Association of Municipal and County Engineers. — Midland Counties District Meeting at Stourbridge.

MONDAY, MAY 25.

Royal Institute of British Architects.—Mr. H. W. Brewer on "Some Churches in the Neighbourhood of Cleves." 8 p.m.

Surveyors' Institution.—(1) Annual General Meeting to receive the Report of the Council and the announcement of the result of the Election of Officers for the ensuing year. 3 p.m. (2) Annual Dinner, Holborn Restaurant. 6.30 p.m.

TUESDAY, MAY 26.

Institution of Civil Engineers.—Annual General Meeting, to receive the Report of the Council and to Elect the Council and Officers for the ensuing year. 8 p.m.

Iron, Hardwares, and Metal Trades' Pension Society.—Forty-eighth Anniversary Dinner at Ironmongers' Hall. Mr. Howard J. Kennard in the chair.

Statistical Society.—Dr. John Venn on "The Nature and Uses of Averages." 7.45 p.m.

THURSDAY, MAY 28

Architectural Association.—Annual Dinner, Criterion Restaurant. 7 p.m.

Guild and School of Handicraft.—Mr. Francis Inigo Thomas on "The Relation of the Architect to the Handicrafts." 8 p.m.

Society of Antiquaries. 8.30 p.m.

Edinburgh Architectural Association. — President's Valedictory Address. 8 p.m.

SATURDAY, MAY 30.

Royal Institution.—Professor A. H. Church, M.A., F.R.S., on "The Scientific Study of Decorative Colour." 3 p.m.

Artists' Benevolent Fund. — Anniversary Dinner, Freemasons' Hall. 7 p.m.

Edinburgh Architectural Association.—Annual Excursion. Kinross House, Tullibole Castle, Aldie Castle, Cleish Castle, and Dowhill Castle.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

6,950.—VENTILATORS: *M. Rodger.*—The ventilating-shaft which is the subject of this patent terminates in a cap shaped like an inverted U, either rigid or revolving, one leg or extension, being, however, shorter than the other. A diaphragm diverts rain-water or moisture that enters the bell-shaped mouth to the discharge end of the ventilating tube, so that water cannot enter the space or apartment to be ventilated.

7,260.—ATTACHING SASH-CORDS: *G. H. Evans.*—Instead of the cord being attached directly to the sash in the ordinary manner, it is, according to this invention, attached to a metal clip let into the usual groove in the frame, and fastened at the top side by screws. The sash pocket-holes are made with a rectangular metal frame, closed with a plate fastened with a turn button on the inside, actuated by a screw-driver from outside.

7,401.—ORNAMENTING SILVERED GLASS: *M. E. Webb.*—According to this invention, a floral, bird, or fruit study is selected, drawn in outline, then transferred with copying paper on to a piece of enamelled paper. The design is then placed on the unsilvered glass; the glass is silvered, the paper design removed, and the study substituted in the space and fixed by pressure.

9,068.—BALANCED WINDOW-SASHES: *T. H. Turner.*—The upper window-sash which is the subject of this patent acts as a counterbalance to the lower sash, and *vice-versâ*. A cord or chain is fixed in front or inserted at the side of the upper and lower window-sashes at corresponding corners. Each cord or chain passes over a suitable pulley which may be fastened to the side or top of the window-frame.

9,093.—WINDOWS: *S. Baxter.*—Instead of nailing the cord in the groove formed in the edge of the sash, a lever-catch, mounted upon a screw-stud in a recess, is formed to receive it in the edge of the sash. The shorter arm of this lever-catch is serrated at its extremity, and is held free from the sash framework so long as the sash-cord is intact; but if the cord breaks, then the serrated arm turns upon its axis and catches in the sash framework, locking the sash in position and preventing it from falling.

9,767.—TIMBER-DOG: *T. Mesham.*—This improved timber-dog is formed of two arms worked with a chain or wire rope, and fitted with a shoe on the ends of the arms to grip the material, instead of a long, sharp prong to pierce the sides of the timber as now in use. The principal object is to lift all kinds of timber securely and without injury.

NEW APPLICATIONS FOR PATENTS.

May 5.—7,717, F. Stokes, Treatment of Lime, Cement, &c., and Lining of Kilns and Furnaces for Burning Bastic Materials.—7,719, J. Melling, Joints for Pipes, &c.—7,737, D. & F. Platt, Dies for Making Dividable Tiles.—7,773, T. Catlow and A. Vass, Kiln for Burning Bricks, &c.—7,786, L. Murch, Preparing Wood for Ornamental and Decorative Purposes.

May 6.—7,812, M. Pinder, Inducing and Regulating Air Currents from Water-closet Basins to the Outer Air when Using Water-closets.—6,813, T. Thorp, Bit and Bit-holder for Working in Stone.—7,845, H. Faija, Continuous or Running Kilns for the Calcination of Cement.—7,848, J. Jeyes, Compound Applicable as Size, Cement, Paint, or Varnish.

May 7.—7,870, E. Sharp, Closets, Urinals, &c.—7,883, J. Southall, Flushing Cisterns.—7,885, C. Blount and others, Translucent Cloisonne Enamel.—7,887, J. Waterhouse, Chimney Cowls.—7,908, J. Bousfield, Stove Tiles, &c.—7,909, Craven, Dunnill, & Co., and F. Smith, Tiles, Ceramic, Mosaic, &c.

May 8.—7,947, A. Pain, Gas Fittings.—7,955, R. Lowe, Joints for Drain and other Pipes.—7,968, J. Hunter, Sash-fastener.

May 9.—8,012, A. Dittmer, Dressing Stone.

PROVISIONAL SPECIFICATIONS ACCEPTED.

4066, T. Hughes, Preventing Draughts and Rain from Entering Underneath Doors, &c.—5,149, J. Bengall, Chamfer Plane.—5,935, E. Devis, Casting Pipes, &c.—6,002, E. Edwards, Iron-heating Pipes.—6,091, C. Horton, Cottage Water-closets.—6,131, G. Hope, Winning or Getting Gravel, &c.—6,158, W. Herbert, Window-fastenings.—6,429, J. Hartley, Sawing Machines.—6,458, R. Wilson, Blues and Greens—Colour Pigments.—6,512, R. Richards, Stoves and Fireplaces.—6,549, S. Emery, Flushing Drains.—6,616, H. Thomas and J. Thomas, Fittings for Hanging Door Curtains or Screens.—6,981, W. Horn, Roofing Paper.—7,184, W. Horn, Artificial Stone.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

1,300, P. Rogers, Cowl or Chimney-pot for Curing Smoky Chimneys.—5,839, C. Tompson, Sanitary or Drainage Pipes.—5,962, H. Moir, Reversible Seats.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MAY 5.—By *Messrs. Cobb* (at Rochester): Freehold land, 5a. 3r. 7p., Maidstone-rd., Rochester, 2,500*l.*

MAY 11.—By *Eastman Bros.*: F.g.r. of 15*l.*, with reversion in 94 yrs., Lenham-rd., Lee, 360*l.*; f.g.r. of 41*l.*, with reversion in 94 yrs., Aislibia-rd., 965*l.*; f.g.r. of 20*l.*, with reversion in 93 yrs., Stanstead-ter., Fulham, 480*l.*—By *L. Farmer*: F.g.r. of 18*l.* 10s., with reversion in 49 yrs., Walthamstow, 425*l.*—By *Harman Bros.*: 35, Park-av., Wood-green, u.t. 93 yrs., g.r. 8*l.* 10s., r. 42*l.*, 425*l.*; 58, Jenner-rd., Stoke Newington, u.t. 82 yrs., g.r. 7*l.*, 370*l.*; 4 and 9, Meynell-rd., Hackney, u.t. 65 yrs., g.r. 20*l.*, r. 95*l.*, 790*l.*; 24, Scarborough-rd., Tollington-pk., u.t. 86 yrs., g.r. 7*l.* 10s., r. 38*l.*, 395*l.*; 67, Tressillian-rd., Lewisham, u.t. 82 yrs., g.r. 8*l.* 10s., r. 63*l.*, 700*l.*—By *F. S. Priest* (at Hammersmith): 428, High-rd., Chiswick, f., area 1,921 ft., 760*l.*

MAY 12.—By *B. Brown*: 50 and 52, Mellish-st., Millwall, u.t. 67 yrs., g.r. 5*l.*, 450*l.*; 60, Mellish-st., u.t. 67 yrs., g.r. 2*l.* 15s., r. 32*l.* 10s., 225*l.*—By *Sherrin & Coltman*: 22 and 23, Laurence Pountney-lane, City, f., area 1,640 ft., 5,200*l.*—By *Rogers, Chapman, & Thomas*: 94, Warwick-st., Pimlico, u.t. 34 yrs., g.r. 8*l.*, 150*l.*—By *T. Mitchinson*: 86, Senior-st., Harrow-rd., u.t. 68 yrs., g.r. 5*l.* 5s., r. 42*l.*, 360*l.*—By *Doswell & Co.*: Three plots of land, 4 acres, f., Caversham, 265*l.*—By *D. Watney & Sons* (at Rochester): 5 to 9, Boley-hill, Rochester, Kent, f., r. 147*l.*, 1,900*l.*; enclosure of market garden land and buildings, 9a. 0r. 13p., f., Strood, Kent, 1,000*l.*

MAY 13.—By *Farebrother, Ellis, & Co.* (at Leicester): 4, 6, and 8, High-st., Leicester, area 229 sq. yds., f., 5,100*l.*—By *Alfred Watson*: 6, Townshend-rd., St. John's Wood, u.t. 15 yrs., g.r. 10*l.*, r. 45*l.*, 270*l.*; 40, Ordnance-rd., u.t. 43 yrs., g.r. 12*l.*, r. 50*l.*, 220*l.*; 17 and 18, Norfolk-rd., u.t. 43 yrs., g.r. 31*l.* 10s., r. 115*l.*, 730*l.*—By *R. Tidey & Son*: 12, Stamford-rd., De Beauvoir Town, u.t. 23 yrs., g.r. 1*l.*, r. 30*l.*, 250*l.*; 99 to 105 (odd), Churchrd., Islington, u.t. 46 yrs., g.r. 30*l.*, r. 178*l.*, 1,885*l.*; 1 to 4, Elsanor-villas, Wood Green, f., 630*l.*; 3, Dorset-st., Spitalfields, f., r. 35*l.*, 440*l.*—By *Norton, Trist, & Gilbert*: No. 217, and 2, Market-st., Edgware-rd., u.t. 37 yrs., g.r. 99*l.* 10s., 2,500*l.*; 77, New North-rd., Hoxton, u.t. 51 yrs., g.r. 6*l.* 6s., r. 43*l.*, 450*l.*; 3, Herbert-st., u.t. 51 yrs., g.r. 5*l.* 5s., r. 35*l.*, 365*l.*—By *D. Young*: 1 and 2, Maldon-villas, East Ham, f., r. 54*l.*, 575*l.*; 3, White Hart-buildings, Tottenham, u.t. 96 yrs., g.r. 15*l.* 15s., r. 52*l.* 10s., 345*l.*

MAY 14.—By *Farebrother, Ellis, & Co.*: The residence "Spencer House," and stabling, Streatham Common, f., 6,000*l.*; a piece of building land, area 2 r. 22 p., f., 1,000*l.*—By *E. Stimson*: 82, 84, and 118, Asylum-rd., Peckham, u.t. 57 yrs., g.r. 21*l.* 6s. 6d., 630*l.*; 2, 4, 6, 8, and 10, Meeting House-lane, u.t. 83 yrs., g.r. 30*l.*, r. 162*l.*, 1,200*l.*; 6, Camden-grove, u.t. 22 yrs., g.r. 4*l.* 13s. 4d., r. 30*l.*, 170*l.*; 42, Chantry-rd., Brixton, u.t. 81 yrs., g.r. 7*l.*, r. 36*l.*, 320*l.*—By *C. C. & T. Moore*: 47 and 48, Lessada-st., Bethnal-green, u.t. 41 yrs., g.r. 6*l.* 6s., 320*l.*; 42, Rook-st., Poplar, f., r. 15*l.* 12s., 115*l.*; 15, Essex-st., Mile End, f., r. 31*l.* 4s., 255*l.*; 119, Antill-rd., Bow, u.t. 55 yrs., g.r. 10s., r. 28*l.*, 335*l.*—By *H. J. Bliss & Sons*: 21, Ames-st., Bethnal-green, f., r. 13*l.*, 110*l.*; 22, 24, and 26, Buckhurst-st., f., r. 85*l.* 16s., 690*l.*; 2, Clarkson-st., f., r. 26*l.*, 270*l.*—By *F. S. Priest*: 23 and 25, St. Mary's-rd., Harlesden, u.t. 73 yrs., g.r. 10*l.*, 670*l.*—By *Newbon & Co.*: 5, Marquis-rd., Finsbury-pk., u.t. 75 yrs., g.r. 6*l.* 6s., 320*l.*

MAY 15.—By *Hince & Lewis*: Enclosure of market garden land, about 4 acres, f., Sunbury, 600*l.*—By *Baker & Sons*: 96a, 100, and 102, Newington Green-rd., and the "Weavers Arms" public-house, f., r. 390*l.*, Islington, 5,600*l.*—By *H. S. Woodcock*: 26, Chantry-rd., Brixton, u.t. 80 yrs., g.r. 6*l.* 10s., r. 35*l.*, 360*l.*; 34, Kay-rd., Stockwell, u.t. 80 yrs., g.r. 5*l.* 10s., r. 39*l.*, 280*l.*; 40, 42, and 44, Basnett-rd., Battersea, u.t. 78 yrs., g.r. 15*l.*, r. 104*l.*, 675*l.*—By *Humbert, Son, & Flint*: F.g.r. of 4*l.* 4s., reversion in 85 yrs., Knowsley-rd., Battersea, 90*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/0/0	9/0/0
Teak, E.I. . load	8/10/0	14/0/0
Sequoia, U.S.ft.cu.	2/3	3/0
Ash, Canada load	2/10/0	4/5/0
Birch, do.	2/3/0	4/5/0
Elm, do.	3/10/0	4/15/0
Fir, Dantsic, &c.	2/0/0	3/15/0
Oak, do.	2/10/0	4/10/0
Canada	4/17/6	6/10/0
Pine, Canada red	2/10/0	3/10/0
Do, yellow	2/0/0	5/10/0
Lath, Dantzic fath	0/0/0	6/0/0
St. Petersburg	5/0/0	7/0/0
Deals, Finland, 2nd & 1st at 100	7/15/0	10/10/0
Do, 4th & 3rd..	7/5/0	8/5/0
Do. Riga	6/5/0	7/15/0
St. Petersburg, 1st yellow ..	9/15/0	14/10/0
Do. 2nd yellow	8/5/0	8/5/0
Do. white	8/15/0	10/10/0
Swedish	6/15/0	15/15/0
White Sea	8/5/0	17/5/0
Canada, Pine 1st	12/0/0	24/0/0
Do. do. 2nd....	9/0/0	16/10/0
Do. do. 3rd, &c.	6/10/0	10/0/0
Do. Spruce. 1st	8/10/0	11/0/0
Do. do. 3rd & 2nd.....	8/5/0	7/15/0
New Brunswick	8/5/0	7/5/0
Battens, all kinds	3/10/0	15/10/0
Flooring Boards, sq., 1 in. prep. 1st	0/10/0	0/14/0
Do 2nd.....	0/9/0	0/10/6
Other qualities	0/6/0	0/7/6
Cedar, Cuba ..ft.	/4	/4½
Honduras, &c.	/4	/4½
Mahogany, Cuba.	/4½	/6½
St. Domingo, cargo av	/4½	/8½
Mexican do. do	/4½	/5½
Tobacco do. do	/5½	/7
Honduras do..	/5½	/6½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio.....	10/0/0	20/0/0
Bahia	9/0/0	18/0/0

TIMBER (*continued*).		
Satin, St. Domingo .....ft.	0/0/10	0/1/3
Porto Rico	0/0/10	0/1/6
Walnut, Italian..	0/0/3½	0/0/7
METALS.		
IRON—Bar, Welsh, in London..ton	6/5/0	8/15/0
Do. do. at works in Wales	5/15/0	6/5/0
Do. Staffordshire, in London	6/5/0	7/0/0
COPPER—British, cake and ingot	56/0/0	57/0/0
Best selected ..	60/0/0	60/0/0
Sheets, strong..	86/0/0	0/0/0
Chili, bars	52/10/0	0/0/0
YELLOW METAL.ft.	0/0/6	0/0/6½
LEAD — Pig, Spanish....ton	12/8/0	12/10/0
English, com. brands	12/10/0	12/12/6
Sheet, English, 3 lbs. per sq. ft. and upwards ..	14/10/0	0/0/0
Pipe	15/0/0	0/0/0
ZINC — English sheet .....ton	26/5/0	0/0/0
Vieille Montagne.....	26/15/0	0/0/0
Silesian	26/10/0	0/0/0
Australian	26/15/0	0/0/0
English Ingots	24/10/0	0/0/0
OILS.		
Linseed .....ton	22/7/6	22/12/6
Cocoanut, Cochin	35/0/0	35/10/0
Do. Ceylon	29/0/0	29/10/0
Palm, Lagos	26/10/0	0/0/0
Rapeseed, English pale	31/0/0	31/5/0
Do. brown	29/10/0	0/0/0
Cottonseed ref...	21/15/0	22 0/0
Olein	21/15/0	24/0/0
Lubricating, U.S.	6/0/0	7/0/0
Do. refined	7/10/0	12/0/0
TAR — Stockholm barrel	1/0/0	0/0/0
Archangel	0/13/6	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

CARDIFF.—For alterations and additions at the Roath Cattle Market, for the Corporation of Cardiff. Mr. W. Harpur, Borough Surveyor, Town-hall, Cardiff. Quantities supplied:—

Jno Robbins	£1,258	0	0
Jno. Hoskins	1,250	0	0
Jno Gibson	1,095	4	7
Henry Davies	1,059	0	0
David Davies	1,037	0	0

* Accepted.

[All of Cardiff.]

FOREST GATE.—For constructing proposed swimming-baths at Woodgrange House, Forest Gate, for Mr. F. Craddock:—

L. Mausbridge	£3 050	Turtle & Appleton	£2,800
W. Goodwin	2,990		

GUILDFORD.—For additions to Archbishop Abbot's School, Northstreet, for the Trustees of the School. Mr. Wm. G. Lower, architect, 12, High-street, Guildford:—

J. Longley & Co	£1,278	J Crook & Son.....	£1,037
Morgan, Isted, & Morgan..	1,246	Robert Smith	1,027
T. E. D'Ones	1,140	Robert Wood	1 016
Higlett & Hammond ..	1,135	Mitchell Bros., Shalford, Guildford (accepted)	975
T. H. Kingerlee	1,119		
G. Strudwick	1,100		

HARROW.—For building pair of villa residences for Mr. H. J. Jackson. Mr. J. Hume, architect and surveyor, King-street, Hammersmith:—

G. A. Allen	£740	T. Barber	£734

LEICESTER.—Accepted for main sewerage and sewage disposal works, for the Corporation of Leicester. Mr. E. G. Mawbey, Borough Engineer and Surveyor:—

Main Sewerage.

S. & E. Bentley, No. 8 Contract.....	£28,342 0 0
S. & E. Bentley, No. 10 Contract.....	14,306 0 0

Sewage Distribution Works, Beaumont Lodge Farm.

S. & E. Bentley, No. 3 Contract	£11,330 0 0

LONDON.—For the erection of a school to provide accommodation for 1,200 children on the old Eagle Brewery, North End-road, Fulham, and also for the erection of a schoolkeeper's house with a room underneath suitable for technical purposes, for the School Board for London. Mr. T. J. Bailey, Architect:—

J. T. Chappell	£22,083	C. Cox	£20,993
Shillitoe & Son	21,570	J. Boyce	18,922
Hart Bros	21,549	J. Bull, Sons, & Co., Limn.	
Hobbs & Co., Limn.	21,461	Southampton*	18,794
S. & W Pattinson.....	21,083		

* Recommended by the Works Committee for acceptance.

LONDON.—For providing and fixing heating apparatus, on the low-pressure hot-water system, for the enlargement of the Westville-road School, Shepherd's Bush, which is now in course of erection, for the School Board for London. Mr. T. J. Bailey, Architect.—

John Grundy.....	£320	J. Derry	£2,336
Comyn Ching & Co.....	298	W. H. Lorden & Son	2,215
Jones & Attwood	295	Co-operative Builders, Ltd., Burton-road, Brixton*..	2,064
J. Wontner-Smith, Gray, & Co.....	274		

* Recommended by the Works Committee for acceptance.

LONDON.—For the enlargement of the Halford-road School, Walham Green, by 400 places, for the School Board for London. Mr. T. J. Bailey, Architect:—

Treasure & Son	£2,598	J. Derry	£2,336
J. Willmott & Sons	2,527	W. H. Lorden & Son	2,215
Lathey Bros.	2,483	Co-operative Builders, Ltd., Burton-road, Brixton*..	2,064
F. J. Coxhead	2,411		
W. Gregar & Son.....	2,372		

* Recommended by the Works Committee for acceptance.

LONDON.—For a two-ton portable steam crane, including about 80 ft. of tramway, to be supplied to the Vestry of Fulham. Mr. James F. Norrington, C.E., Surveyor:—

J. H. Wilson & Co.	£600	Grafton & Co.	£470
J. Booth Bros.	585	J. Jessop & Co.	465
J. Gibb & Co.	475	H. J. Coles	415

LONDON.—For rebuilding part of Sylvan Cottage, Hornsey-rise. Mr. George Carter, architect, 513, Holloway-road:—

R. J. Lowns & Sons (accepted)..... (Inclusive of cellars.)	£895 0 0

LONDON.—For making up the following roads for the Vestry of Fulham. Mr. W. Sykes, New Streets Surveyor:—

	Broomhouse-road.				Cassidy-road (Sec. III.)			
	R.	Y.	V.	I.	R.	Y.	V.	I.
	£	£	£	£	£	£	£	£
Nowell & Robson.....	429	282	—	—	304	187	—	—
T. Adams	477	287	252	233	324	189	166	153
Tomes & Wimpey	471	301	285	270	363	211	200	189
Imperial Stone Co.....	—	—	—	212	—	—	—	142

R.—All work except the actual paving. Y.—York stone paving. V.—Victoria stone paving. I.—Imperial stone paving.

LONDON.—For erecting brewery tap, Upper Kennington-lane, Vauxhall, for the New London Brewery Company, Limited. Mr. Wm. M. Brutton, architect, 1, Catherine-street, Strand, W.C.

D. Charteris	£2,590	W. Rowe	£2,000
T. Hooper	2,500	Wm. Smith	1 815
G. S. Archer.....	2,160	Romaine (accepted)	1,795
G. Ford	2,045		

LONDON.—For taking down and re-building the "Old Friends" beerhouse, and two shops adjoining, Lower Holwich-road, S.E., for the New London Brewery Company, Limited. Mr. Wm. M. Brutton, architect, 1, Catherine street, Strand, W.C.:—

T. Hooper	£2,321	Wm. Smith	£2,385
G. Ford	2,870	Romaine.....	2 090
G. S Archer.....	2,630	Bridle (accepted at £2,022).	2,100
W. Rowe	2,467	D. Charteris (withdrawn)..	2,062
T. C Smith	2,469		

LONDON.—For building three shops on forecourts, Fulham Palace-road, Hammersmith, for Mr. Atkinson. Mr. J. Hume, architect and surveyor, King-street, Hammersmith:—

H. Hayward.....	£162	H E. Tomes.....	£135

LONDON.—For building three shops on forecourts, Bridge-road, Hammersmith, for Mr. T. R. Jones. Mr. J. Hume, architect and surveyor, King-street, Hammersmith:—

J. J. Bryant.....	£393	H. E. Tomes.....	£318
Plumridge & Thomas	297		

LONDON.—For alterations and repairs to the "Duke of York" public-house, St. Ann's-terrace, St. John's Wood, N.W., for Mr. R. Cooper. Messrs. Saville & Martin, architects, 86 and 87, Strand. Quantities supplied by the architects:—

G. E. Todd.....	£1,098	E. Toms.....	£911
N. Schlutter	966	Gould & Brand	857
S Goodall	934	Burton & Sons.....	806

Pewterer's Work.

T. Heath.....	£125	Sanders & Sons	£105
Watts & Co.	124	F. J. Ruse	103

LONDON.—For alterations and repairs to the "Dolphin" public-house, Union-street, Borough, S.E., for Mr. E. Little. Messrs. Saville & Martin, architects, 86, Strand. Quantities supplied by the architects:—

C Tunmore	£498	B. Cooke	£365
Sanders & Sons.....	433	Spencer & Co.	354
Yeats & Co.	429	C. H. Bates	349

LONDON.—For pulling down old buildings in Burdett-street, Westminster Bridge-road, and erecting foundry and warehouse, cutting, erecting furnaces, and building two new shafts, for Messrs. H. D. Dale & Co., 100, Westminster Bridge-road, S.E. Drawings and details by Mr. J. Evans, Hoxton:—

Evans & Co., 28, Tavistock place, W.C. (accepted).. £900 0 0

[Two other tenders.]

LONDON.—For rebuilding the "Grecian" Restaurant, 224, Strand, W.C., for Mr. R. Baker. Messrs. Saville & Martin, architects, 86, Strand. Quantities supplied by the architects:—

W. Shurmur	£5,678	0	G. H. & A. Bywaters .. £4,818 9
E. Toms	5,315	0	Gregory & Co. 4,806 0
S. Goodall	5,254	0	Gould & Brand 4,744 0
Ashby Bros.	4,892	0	

Pewterer's work.

J. Edwards.....	£337	0	F. J. Ruse £289 5
T. Heath.....	297	0	Sanders & Sons..... 252 10
W. Helling.....	289	10	

Gasfitter's work.

J. Dodson	£293	0	F. Praguell..... £192 0
W. Heath	223	0	J. Biggs 178 19

LONDON.—For rebuilding the "Star and Garter" public-house, No. 13, Green-street, Leicester-square, W.C., for Mr. J. F. O. Wood. Messrs. Saville & Martin, architects, 86, Strand. Quantities supplied by the architects:—

S Goodall	£3,750	F. Saunders	£3 510
R. Perkins.....	3,635	Spencer & Co.	3 480
J. Anley.....	3,599	D. Payne	3 421
T. Green.....	3,522	Gould & Brand.....	3,390

Pewterer's work

Watts & Co.....	£208	15	0 F. J. Ruse..... £181 0 0
T. Heath	185	0	0 Sanders & Sons 177 10 0
W. Helling	181	0	0

LONDON.—For painting and repairs to the "Load of Hay" public-house, Pratd-street, Paddington, W., for Mr. R. Baker. Messrs. Saville & Martin, architects, 86, Strand:—

W. Heavens	£99	12	3 W. Oldrey & Co. £137 0 0
W. Langridge & Sons..	145	0	0 W. S Lane 125 0 0

LONDON.—For painting and repairs to the "Duke of York" public-house, Victoria-street, Pimlico, S.W., for Mr. E. Baker. Messrs. Saville & Martin, architects, 86, Strand:—

W. Heavens.....	£171	10	0 W. Langridge & Co. .. £105 0 0
H B. Oldrey.....	125	0	0 W. S. Lane 80 10 0

LONDON.—For repairs to houses for the Lambeth Estate Company. Messrs. Ayres & Ardron, architects, 8, Southampton-street, Bloomsbury-square, W.C.:—

Henry & Lumley	£7,042	Young & Lonsdale	£4,997
Nightingale	6,336	Holliday & Greenwood* ..	4,888
Thos. Turner, Lim.	5,691	* Accepted.	

LONDON.—For alterations, &c., at Newtonwards, Chelmsley Park, Highgate, for Mr. J. Wilkinson. Mr. E. B. l'Anson, architect, 7a, Laurence Pountney-hill, E.C.:—

Lidstone	£286	Young & Lonsdale	£216
Brown	232	Stevens Bros.	195

LONDON.—For new entrance and foyer, with alterations to grand staircase, at the Royal Surrey Theatre, Blackfriars-road, for Messrs. Sambiln & Burdett. Mr. George Carter, architect, 513, Holloway-road:—

R. Wood (accepted)	£1,395 0 0

LONDON.—For making-up, paving, &c., Richmond-road and Addison-gardens, in the parish of Hammersmith, for the Vestry. Mr. H. Mair, Surveyor:—

W Neave & Son	£581	Nowell & Robson	£560
Tomes & Wimpey	574	Rogers	559

LONDON.—For rebuilding No. 23, Whitcomb-street, Haymarket, for Messrs. Rellees & Jenkins. Mr. Wm. M. Brutton, architect, 1, Catherine-street, Strand, W.C.:—

G Ford	£553	G S Archer	£545
Lorden & Son	549	R. C. Scutt	500

LONDON.—For alterations and additions to "The King's Arms" public-house, Lower Kennington-lane, S.E., for Mr. E. H. Lewis. Mr. Wm. M. Brutton, architect, 1, Catherine-street, Strand, W.C.:—

B. Crook	£592	10	G. Picton* £3 1
R. F. Saker.....	552	0	* Accepted.

LONDON.—For shop-fittings, 219, Blackfriar's-road, for Mr. J. S. Robinson. Mr. E. J. Stevens, architect, 33, Talford-road, Camberwell, S.E. :—

	Walnut and Teak with Ebonized Mouldings	Ebonized Mahogany and Gilt Mouldings.	Mahogany.	Pitch-pine with Mahogany Mouldings.
Sage & Co.	£477	£449 15	£489 10	£396
King and Son	450	435 0	—	415
Whitehead & Co.	—	—	395 0	—
Bright & Co.	395	—	—	380

LONDON.—For alterations and repairs to 17 and 19, Featherstone-street, City-road, E.C. Mr. Wm. M. Brutton, architect, 1, Catherine-street, Strand, W.C.

G. Patton	£385	G. S. Archer	£300
E. & F. Parsons	315		

LYNDHURST (Hants).—For building powder magazine at Eyeworth Lodge, near Lyndhurst, Hants, for the Schultze Gunpowder Company, Limited. Messrs. Lemon & Blizard, engineers, Southampton.

G. A. Bartlett	£395 0 0	Francis Reeks	£349 0 0
John Crook & Son	389 0 0	Francis Walter	320 0 0
C. Mitchell	389 0 0	Joseph Butt, Fitzhugh, Southampton*	289 15 7
J. W. Ros & Co.	350 0 0		

* Accepted.

NORWOOD.—For re-erecting the "King's Head" public-house (exclusive of fittings), for Mr. W. Wood. Mr. E. J. Stevens, architect, 33, Talford-road, S.E. —

W. Martin £2,800 0 0

[No competition.]

PLUMSTEAD.—For alterations and additions to the "Lord Raglan" public-house, Torrence-road, Plumstead, for Mr. D. Jenkins. Mr. E. J. Stevens, architect, 33, Talford-road, Camberwell, S.E.

J. Yates & Co.	£1,122	King & Sons	£930
G. W. Ford	1 048	Alex. Mackie	884
J. H. Pugh	949		

PLYMOUTH.—For the erection of business premises, exclusive of painters' and glaziers' work, Tavistock-road, for Mr. R. F. Roper. Mr. Jas. Harvey, architect, Bedford-chambers, Bedford-street. Plymouth. Quantities by the architect :—

Wm. Trevena	£1,965	Palk & Partridge, Plymouth*	£1,527
Saml. Roberts	1,348		
A. N. Coles	1,329		

* Accepted.

SEAFORD.—For the construction of about 400 yards of pipe sewers, with manholes, &c., for the Local Board :—

C. Morling, Seaford (accepted) £175 0 0

SHEFFIELD.—For the lodge, refreshment pavilion, &c., at Endcliffe Woods, Smith Hill, Ecclesall, from specifications, &c., prepared by Mr. C. F. Wike, C.E., Borough Engineer :—

C. Chadwick	£1,658 0 0	J. Holmes	£1,486 7 0
J. Morton	1 645 18 6	Lowe & Son	1,429 14 0
Mosley & Sons	1,561 16 8	Ash, Sorby, & Biggin, Sheffield*	1,387 0 0
E. Gabbutt	1 551 11 10		
T. Roper	1 517 0 0		

* Accepted.

SOWERBY BRIDGE.—For widening and improving an iron bridge at Mearbrook, for the Local Board of Sowerby Bridge. Mr. Fredk. Rothery, Surveyor, Town Buildings, Sowerby Bridge. Quantities supplied :—

Goodyard, Massey, & Warner, Nottingham (accepted) £518 1 0

STOKE-UPON-TRENT.—For the erection of a house, stabling, &c., for Dr. W. Hind. Messrs. R. Scrivener & Sons, architects, Hanley, Staffs. :—

Price	£2,023	Bennett	£1,729
Breeze	1,848	Gallimore, Newcastle*	1,699
Tomkinson & Bettley	1,797	Partridge	1,648
Inskip	1,734	Hancock	1,640

* Accepted.

STONE (Staffs.).—For erecting villa residences, for Mr. H. Overton Jones. Mr. Edwin Penn, architect, Stoke-upon-Trent :—

T. R. Yoxall, Stoke-upon-Trent (accepted) £1,230 0 0

TOTTENHAM.—For the erection of two shops, for Mr. J. W. Seabrook. Messrs. Hodson & Whitehead, architects, 7, Finsbury-square :—

F. Voller	£1,440 0 0	C. J. Dye	£1,130 0 0
C. C. Payne & Son	1,187 10 0	Jesse Chessum & Son	1,098 0 0
E. Maskell	1 155 0 0	M. A. Brown & Co.*	1,080 0 0

* Accepted.

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The Builder.

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The Management of Roads by County Councils.

TWO years have now passed out of the three which have been decreed as the life of the first County Councils, and it will be interesting to note what effect their creation has had on the management of highways throughout the country. The Councils were charged by the Local Government Act of 1888 to take over the maintenance of the main roads, and we have recently been placed in possession of a good deal of information relating to the way in which that part of the Act is being worked, partly from a discussion which occurred at the first annual general meeting of the County Councils' Association, and, secondly, from a report which has been compiled for the County Surveyors' Society by Mr. T. H. B. Heslop, the County Surveyor of Norfolk. We will deal first with this gentleman's valuable compilation. To the surveyor of each of the sixty-three counties into which England and Wales have been divided by the Act, he forwarded a string of questions, the most important of which were as follows:—

1. What system has been adopted for the management of your main roads?

2. Upon what principle has your Council settled with urban authorities which claim to retain the management of the main roads in their districts? How do you act with reference to (*a*) "Reasonable improvements;" (*b*) "Supervision" and "establishment charges?" (*c*) Has any difficulty or dispute arisen on this point?

3. Do you water the roads or contribute in any way to this? and if so, upon what basis?

4. Do you roll your roads by steam power or other means? Can you give average cost per yard super. for rolling?

5. Footpaths. The liability to maintain these being now thrown upon County Councils, does your Council contemplate making any stipulations with regard to paved footways in urban districts?

6. Have you had any case of "extraordinary traffic" under the section of the Highways Act of 1878? If so, state method of dealing with it.

7. Is your salary paid by commission? If so, have you received any such payment from your County Council?

From forty-eight of these counties he received replies, so that although the report is not complete, it is sufficiently so to enable a very good idea to be obtained of how the above-named matters are being attended to. There is, of course, a great diversity in the manner and in the matter of the replies which have been given to these questions by the county surveyors. It will be recognised that the questions afforded considerable scope for dilating on the various topics introduced to the notice of these gentlemen, but in some cases, unfortunately, the supply of the necessary information is remarkably scant and the answers most laconic,—errors which will probably be rectified if the report becomes an annual publication.

The perusal of this document has a natural tendency to bring under review those who are the subscribers to the answers,—persons who occupy most important professional positions in each county, and who are the witnesses (so to say) to the evidence in this case. It is not unusual to attach weight according to the eminence of the individuals who give opinions and announce facts; and when a report is issued by a Parliamentary or a Royal Commission, our confidence in it is greater if we are satisfied with the composition of that Committee. It may be interesting, therefore, to analyse the *status* of the gentlemen who furnish the details from which this report has been compiled. There are three professional institutions which may well be styled national, and to which most English architects, engineers, and surveyors of any eminence belong—viz., the Royal Institute of British Architects, the Institution of Civil Engineers, and the Surveyors' Institution: of these three, the Institution which might more pre-eminently be expected to supply county surveyors of roads is that of the Civil Engineers, but of the forty-eight county surveyors now under review, only thirteen belong to that Institution, six to the Surveyors' Institution, and six to the Royal Institute of British Architects. Three of these gentlemen belong to two of those Institutions, but more than half do not belong to either of the three. Is it too much to expect that, when vacancies occur in such county appointments, the County Councils will make it a condition that the vacancy shall be filled by a gentleman belonging to at least one of those professional Institutions?

Five counties—viz., Bedford, Cambridge (Isle of Ely Division), Essex, Stafford, and Worcester,—have appointed special county surveyors of main roads, independent of the county surveyors, and we are, therefore, brought into contact with a question of remarkable importance, having regard to the large expenditure involved by the maintenance of main roads. What are the qualifications most desirable for a county surveyor of roads, and should his duties be merged in those of the ordinary county surveyor or should they not?

On this point we are very much inclined to endorse the wisdom of the step taken by the five counties above-named, for the close supervision, the careful inspection, and the considerable amount of travelling which is necessarily attached to such an office as that of a county surveyor of roads, can scarcely be performed in a county of any size with the efficiency which is the soul of economy, if it be combined with the ordinary duties of a county surveyor. The fact is that one is work for an engineer and the other for an architect, and when in combination, one or other is liable to the neglect which from physical causes is unavoidable. There would be ample occupation in most counties for the whole time of a good engineer on work about which it is very rare to note much scientific treatment, the contrast between the skill displayed in town work and country work being remarkable. It is precisely the class of work which requires sound judgment and a master's eye, and we can scarcely imagine a measure of greater and more real economy for counties of any magnitude than the creation of such an office. The holder should be an engineer, and he should be a man whose integrity is beyond suspicion, for, as is well-known, a road surveyor can, with but little fear of detection, acquire round the corner enough to make a very comfortable addition to his salary, every penny of which comes out of the ratepayers' or the taxpayers' pockets.

The result of the appointment of the late Sir Henry Harness, then Captain Harness, of the Royal Engineers, as supervisor of the roads of South Wales, on account of which a Government loan had been granted, is in itself sufficient to inspire confidence in the success of such a creation. He was succeeded Mr. Codrington, M.I.C.E., now of the Local

Government Board, admittedly one of our greatest, if not the greatest authority on road affairs in the kingdom. Under these gentlemen the roads of South Wales were converted from quagmires into the best and most economically-managed roads in the kingdom, and it should be generally known that these gentlemen had not merely authority over main roads, but over *all* the roads in South Wales. This was an intelligible system; but as the case stands at present, not merely under the Local Government Act of 1888, but under previous Highway Acts, large grants have been annually made from the Imperial treasury in aid of road maintenance in England without any sort of guarantee (which would be of any real value) that those grants are being expended in the most profitable manner. One county may adopt one system of management, and another county another system, one being excellent and the other execrable; but in the latter case the Government grant cannot now be withheld, and the country consequently recompenses the evil with the good. It may be urged that the result of the adoption of a bad system falls with greater force locally, and that it will rectify itself, and also that there is an aversion to grandmotherly government, and that Government inspection is an extra expense, and so on; but those who so argue perhaps omit to note that the Government does retain a hold over the proper utilisation of grants for many purposes,—such as the administration of the poor law, the care of lunatics, registration of births and deaths, vaccination, education, &c., so that uniform systems of management are established throughout the land for these important public matters.

But roads are still in the chaotic state which will be immediately recognised by any one who may have the opportunity of perusing Mr. Heslop's report or the proceedings of the last meeting of the County Council Association. So large a proportion of the cost of maintaining main roads is now derived from sources other than the rural ratepayer, that it would seem fairer if the interests of those who find those funds were protected by some form of Government inspection similar to that which exists for the other purposes above-mentioned, so as to obtain a guarantee that these large grants were being put to the best use or otherwise withheld. It might be thought that the presence of a leavening of borough councillors in the council of each county would have ensured this object, this careful guard over funds derived in great measure from urban inhabitants, but the effect is not so—they have many other things to attend to, and if not they would generally be outvoted by the rural councillors. On the whole we are constrained to admit that the only form of control which can be relied on as effective is that of Government inspectors.

It is well known to every one who has devoted sufficient attention to the matter, from the Chancellor of the Exchequer downwards, that absolute equitability of rating is not attainable, and can only be approximated, but there is one point in connexion with road management which has seemed to us never to have received the attention which it deserves, and that is, what is the right or the most appropriate proportion for the main roads in a county to bear to the ordinary highways, mile for mile, and what are the influences or circumstances of counties which would conduce to such proportion, great or small, as the case may be?

It was, and is, manifest that it is unfair for a parish through which no main road runs to be charged as high a county rate as that paid by a parish which, owing to accidental circumstances, is traversed, possibly from end to end, by a main road. In this respect the establishment of highway districts embracing several parishes produced no real relief of local taxation to the individual parish so circumstanced, for the county rate levied for main road maintenance is simply subdivided by the authorities of highway districts amongst the different parishes, according to their rateable value. Tracing the history of the matter, we see that the position has been entirely reversed: the parochial complaint was, in the first instance, at having to pay all the cost of maintaining a road over which outsiders travelled; then came the turnpikes, which in some measure relieved them; then came the abolition of the turnpikes, and the commencement of Government grants,—first one-half of the cost, then three-quarters, and now something which is not yet accurately known, as it depends on a variety of circumstances, but which ought to be something between three-quarters and the whole. Consequently, the more main road there is in a parish the better for it.

Comparative Mileage of Main Roads in Counties.

1888.		1890.	
County.	Proportion of mileage of main road to ordinary highways.	County.	Proportion of mileage of main road to ordinary highways.
1 Gloucester	1 to 2·7	1 Gloucester	1 to 2·0
2 Bedford	,, 2·8	2 Bedford	,, 2·2
3 Huntingdon	,, 3·2	3 Huntingdon	,, 2·5
4 Wilts	,, 3·3	4 Oxford	,, 2·6
5 Westmoreland	,, 3·4	5 Cambridge	,, 2·8
6 Worcester	,, 3·7	6 Norfolk	,, 2·9
7 Derby	,, 3·7	7 Westmoreland	,, 3·2
8 Dorset	,, 3·8	8 Wilts	,, 3·3
9 Stafford	,, 4·0	9 Worcester	,, 3·3
10 Oxford	,, 4·0	10 Dorset	,, 3·4
11 Cambridge	,, 4·2	11 Essex	,, 3·5
12 Monmouth	,, 4·2	12 Derby	,, 3·5
13 Chester	,, 4·3	13 Berkshire	,, 3·7
14 Warwick	,, 4·4	14 Cumberland	,, 3·7
15 Rutland	,, 4·5	15 Rutland	,, 3·8
16 Durham	,, 4·6	16 Lancashire	,, 4·0
17 Nottingham	,, 4·6	17 Stafford	,, 4·0
18 Cumberland	,, 4·7	18 Leicester	,, 4·1
19 Northampton	,, 4·7	19 Chester	,, 4·2
20 Northumberland	,, 5·3	20 Warwick	,, 4·3
21 Essex	,, 5·3	21 Monmouth	,, 4·3
22 Leicester	,, 5·4	22 Nottingham	,, 4·5
23 Norfolk	,, 5·5	23 Durham	,, 4·6
24 Hampshire	,, 6·2	24 Northampton	,, 4·7
25 Berkshire	,, 6·5	25 Northumberland	,, 4·8
26 Kent	,, 6·5	26 Hampshire	,, 6·0
27 Buckingham	,, 7·3	27 Kent	,, 6·2
28 Hertford	,, 7·4	28 Buckingham	,, 6·8
29 Lincoln	,, 9·0	29 Hertford	,, 7·0
30 Lancashire	,, 9·9	30 Lincoln	,, 8·3
31 Cornwall	,, 11·0	31 Cornwall	,, 9·0
Average	1 to 5·0	Average	1 to 4·2

The above table has therefore been prepared to illustrate how this matter stands in most of the English counties. Gloucester, which stands at the top, has now exactly one-third of the roads of the county classed as main. The council of this county happens to be under the chairmanship of a gentleman, Sir John Dorrington, who has always understood and taken an enlightened view of economic road management, and was one of the first to follow the example of South Wales (possibly from the proximity of the two districts) in the use of the best material even at a high cost. The two "university" counties have both advanced considerably, and, singularly enough, are next each other in the list both in 1888 and 1890.

Lancashire, Essex, and Norfolk have each made a great increase, the first being under the chairmanship of the President of the County Council's Association, the Right Hon. J. T. Hibbert, the second is one of the few counties in which a special surveyor of roads has been appointed, and the third has for its surveyor the compiler of the above-mentioned report (Mr. Heslop). These three counties account for just one-half of the increase of main-road mileage in the whole list.

The important counties of Hampshire, Kent, and Lincoln stand very low, and Cornwall still closes the list.

Suffolk in 1888 had the remarkable disproportion of 1 in 22·6! and we are not aware of any great change yet in this respect. It appears, then, that the increase in the proportion of main road in a county is not accidental, but has been carried out advisedly by men who recognise that such a policy is advantageous in every respect, and an examination of the order in which the counties stand in this table will reveal no other circumstance which can account for the above-mentioned facts.

Mr. Heslop's report is in itself so instructive, if perused with care, that it seems a pity to confine it to the county surveyors. There are a great many persons both in town and country, and more particularly those who have, or may have, to serve on the Highway Boards or Committees of rural or urban districts, and of their counties, to whom this report should be beneficial, and we throw out the hint to the County Council Association to get leave to reprint and disseminate it. The more these matters are ventilated, and the greater the opportunities for comparison, the greater is the likelihood of improvement in this great public operation. The report shows very clearly that there is a great variety of systems of management, and that in no two counties is precisely the same system followed.

There is, however, no question with which County Councils have at present to deal which bristles with more difficulties than the relations between counties and towns for the contributions which the latter should receive (out of the Government grants) towards the cost of maintaining those portions of the streets which come under the head of main roads. The gentlemen of the long robe are thriving well on this fertile source of litigation, and the question has been still further complicated by the attempt to divorce (in the matter of cost) a roadway or street from the footpaths or pavements which fringe it. The result of litigation between Wiltshire and Warminster on this point, decided by Judges Grantham and Charles in the course of last year, has given rise to much debate. They decided that Warminster was entitled to receive contributions from Wiltshire equivalent to the cost of the maintenance and repair of, and reasonable improvements to, all or any of the footpaths on the sides of the main roads as parts of such main roads, Justice Charles adding, "It is quite clear that the *whole* expenses of the main road, from hedge to hedge, are thrown on the County Council." Unfortunately, it is quite as clear from the wording of the Local Government Act that there is no justification for deciding that the County Councils are liable for the *whole* of such expenses, the wording of Cl. 11 (2) being that the county shall contribute *towards* the cost of maintaining such (urban) main road. However, Wiltshire has not appealed from this decision, but so strongly do most County Councils feel on this point, that passive and active resistance is offered generally. The Act unquestionably requires to be more definitely worded on this point, as much money is going into the lawyers' pockets which would be far more beneficially expended on the roads and streets; there are other points also in this Act which might be amended clearly, so as to remove any excuse for resorting to litigation. We should have supposed that an allotment by the Treasury of a grant to each Local Board or Corporation, based on the rateable value of each town, and proportionate to the total grant to each county, would have been the simplest mode of dealing with such cases, and that such amounts could have been paid direct without passing through the County Treasurers, or cumbering and complicating the County accounts. There would have been no question then about which of the streets, or parts of streets, of a town were "main roads." As a matter of fact, the cost of maintaining, in the one case, streets in towns, and, in the other case, roads in the country, bears as nearly as possible the same ratio towards the rateable values of the areas over which the cost is incurred, so that, though the towns might receive under such an arrangement more than they do at present towards this item of ex-

pense, it would be a fair and equitable arrangement. This would also dispose of the question about contributing to the cost of watering roads, which is never or scarcely ever done outside the limits of an urban authority.

With respect to steam-rolling, as much difference of opinion exists on this as on other points. The North-Western county (Cumberland) calls the steam-roller the "tool of the amateur," and does not use it, whilst the South-Eastern county (Kent) rolls all roads, both great and small. Very few of the surveyors referred to can give any idea of the cost of rolling; some give ½d. per square yard, and one says it sometimes costs as much as 1s. per square yard, whilst in another case it is given as from 9d. to 1s. per *cube* yard! Where steam-rolling is habitually done, it is believed that the cost averages about 8 per cent. of the remainder of the cost of maintenance, and this would be a far more accurate mode of estimating it than by the cube of stone or superficies of road. The majority of counties do not roll the country roads, and though they save in one respect, they lose in another,—wear and tear of carriages, harness, horse-power, and stone, which probably more than counterbalance the supposed gain, and produce also vexation to body and mind.

The last question about commission was, perhaps, a somewhat awkward one to answer; there appears to be great diversity in the mode of payment of these surveyors, and doubt whether and in what way they can receive commission as well as salary, but none apparently receive commission from the County Councils for the work they render to the roads, though many get it for new works of other kinds, some for all new work, others for new work only of a certain magnitude.

The establishment of the County Councils Association has probably been the most important act of the past year, and result of the Local Government Act of 1888. Comprising in its Executive Council some of the clearest-headed men in the country, we venture to predict for it a future of great power and of immense advantage to every one. Those few counties who have not yet joined it will probably find the small expense of association well repaid by the valuable statistical information which it will be able to collect and disseminate, and those who are yet more or less ignorant on the important matter of roads which has been the subject of this article, will find the path to knowledge sensibly eased. It should also most certainly help to extract the County Councils from the chaotic state in which they still are in respect to the management of their roads.

NOTES.

WE have before us the draft copy of an appeal which the Architectural Association is about to issue to the profession for assistance towards a fund for enabling them to start on a secure financial basis the extensive system of architectural education which the Association has formulated. A quotation from a portion of the statement, as to the objects aimed at, and the liabilities they involve, will best place the matter before our readers:—

"The first step taken,—after the various changes had been decided upon, and the rules of the Association had been amended accordingly,—was to find suitable premises, where the work of the studio and classes could be properly and efficiently performed, for it was found impossible to obtain the necessary accommodation at No. 9, Conduit-street, where the Association has hitherto been housed. Very suitable premises have, however, been found in the immediate neighbourhood, and it has been decided to take them and fit them up at once, in preparation for the opening of the session in October.

To acquire, alter, and fit up these premises, a sum of 800*l.* at least is required, and to meet this and other expenses, and put the Association on a sound financial basis, it is thought that a capital sum of not less than 2,000*l.* should be raised. Several contributions and promises of financial support have already been received, but, as the question of the training of students is of great importance to all who have the interest of architecture at heart, it is confidently hoped that the remainder of the sum will be quickly subscribed, and that the Association may not be hampered by debt at the present important juncture.

The rent of the premises named is 160*l.* per annum, and there are also rates, cleaning, lighting, and heating to be paid for, say 190*l.* The estimated fees to be paid to lecturers and masters will amount to about 700*l.*, making a total annual expenditure of 1,050*l.* to be chiefly met out of the fees charged to students.

It is intended to charge each student a fee of 10*l.* 10s. for the whole course each session, or a proportionate fee for a part of the course. If 100,—*i.e.*, 25 in each year,—students join, the expenses will be met; but since it is possible that for the first year or two, until the advantages offered are better known, this number may not be reached, a guarantee fund has been founded to meet any deficiency that may thus arise during the next three sessions. Promises towards this fund are earnestly requested.

One of the chief features of the new scheme is the establishment of a studio, where the student will be encouraged to consider design and construction in their due relations to one another, and where he will prepare working and detail drawings; and the Committee hope to be able to secure the assistance of eminent architects to act as visitors."

The formation of a museum of casts and models for study, and of a reference library, is also under consideration. The Association has already received several liberal donations towards this large and spirited scheme, Mr. Waterhouse heading the list with a donation of 100 guineas towards the general fund; Mr. H. L. Florence has contributed a similar sum towards the fund for a library, and liberal donations have also been promised from Messrs. Leonard Stokes, Aston Webb, F. T. Baggallay, and other well-known members of the profession. We desire to express strongly our appreciation of the earnest and public-spirited action of the Association in endeavouring to further the cause of architectural education, and we hope that this effort will meet with the support from the profession at large which it certainly deserves.

FROM Harvard University comes a very important contribution to the now notable controversy on the Greek stage. Mr. J. Williams White sends a pre-print from the "Harvard Studies in Classical Philology," Vol. II., entitled, "The 'Stage' in Aristophanes." The thesis he is prepared to maintain is briefly this,—that the comedies of Aristophanes could not have been performed on the stage of Vitruvius. "The stage in a Greek theatre," Vitruvius says,—as most people now know,—"should not be less than 10 ft. nor more than 12 ft. high." He also says that the actors performed on the stage, the chorus in the orchestra, and this last statement is repeated by Pollux. The archæological evidence on this important point we have often touched upon. Scholars and archæologists alike are now looking eagerly for the completion of the excavations of the Megalopolis Theatre, and the full statements of competent authorities on both sides as to the deductions to be drawn from it. Meanwhile there is the literary side of the argument which no one can afford to neglect, and, as Mr. Williams White points out, it is generally agreed that the lexicographers and scholiasts must be practically abandoned; we must depend upon the evidence furnished by the Greek dramas themselves. The most bewildering confusion of terms and conceptions pervades the writing of the lexicographers and scholiasts; and yet through all this confusion may be traced the dominant belief in the existence of a stage. The last fact proves no more than that this belief arose and became fixed before the time of the later writers. Mr. Williams White begins with Aristophanes, but he promises us before long a similar examination of the plays of Æschylus, Euripides, and Sophocles. The main bulk of his pamphlet is given naturally to purely literary evidence, which we cannot resume here, but his introductory remarks and statement as to the architectural evidence of the excavated theatres (excepting Megalopolis) may be recommended to those who are not posted up to date.

AN important discussion on the question of classification took place at last Tuesday's sitting of the Railway Rates Inquiry. The traders suggested that the classification, as amended by the Board of Trade, should be accepted as a reasonable compromise between their own proposals and those of the Railway Company's, both parties withdrawing any further amendments. The counsel for the Company, however, did not fall in with the suggestion, and successfully resisted it. The classification, as submitted by the Board of Trade, differs very widely from that drafted by the Companies; and, although many of the alterations were the result of agreements between them and the traders, others were only adopted under strong protest by the railway interest. It is not surprising, therefore, that they should seize every opportunity of endeavouring to get their own proposals restored. It was intimated that they only intend, at this stage, to press a few points to which they attach considerable importance. They succeeded in carrying the first amendment they submitted to the Committee, which will enable them to require a minimum load of four tons instead of two tons for the goods comprised in class B,—four tons being the minimum originally proposed by themselves. At that time but few articles were included in this class, whereas in the revised classification it contains more than double the number (including sub-divisions). It is probably in consequence of several important reductions having been effected by this transfer of merchandise from higher classes, that the minimum originally demanded is now conceded.

THE death of Mr. Alexander Peebles, the City Architect, which is mentioned in another column, will be heard of by many of our readers with great regret. Referring to the vacant office, the *City Press* says:—

"Now that the Court of Common Council have lost their Architect, it is to be expected that the question that was fought at the time of the election of Mr. Peebles will again be considered. It will be remembered that at that time there was a strong feeling that the Court would do well to abolish the office of Architect, appointing a City Surveyor, on the understanding that when any work of special importance had to be undertaken, designs should be invited from eminent architects not officially associated with the Corporation. There can be but little doubt that the Corporation would act wisely in adopting such a course."

We have before urged the same view in regard to official architectural appointments and official architecture. It by no means follows that the man best able to carry on the generally somewhat routine business of an architectural adviser and surveyor to a corporation or company is at the same time a man of architectural genius; indeed, the reverse is likely to be the case, as men of artistic temperament are generally rather indisposed to the prosaic duties which mostly fall to the lot of an official architect; and even if he were, it is not desirable that all buildings erected under a corporation should be stamped with one unvarying character. It is far better for architecture that they should be the work of varied minds and varied tastes. The ill-effects of the system of official architecture have been unfortunately illustrated lately in the erection of various post-office buildings by the Office of Works, all stamped with the same expression of architectural commonplace.

THE twentieth volume of the *Transactions of the Institution of Civil Engineers of Ireland* contains a paper by Mr. W. G. Strype on "The Prevention of Waste or Misuse of Water in Towns." There are three distinct sources to which waste or misuse of water may be traced: 1st, leakages in dis-

tributing mains; 2nd, leakage in the house connexions and fittings; and 3rd, waste by consumers allowing the water to run away; and the author explains how, in the case of the town of Wicklow, these several causes of loss were discovered by the use of Mr. Deacon's meter and his system of detecting waste. Full particulars of the system and a detailed description of the apparatus will be found described by Mr. Deacon in Vol. XLII. of the *Proceedings of the Institution of Civil Engineers*. A long discussion followed Mr. Strype's paper, in which the President took an active part and contributed much useful information, including the result of a series of experiments he had undertaken to ascertain the quantity of water that can escape through small leaks in lead service pipes, from which it appears that with a water-pressure of 56 lbs. per square inch no less than 206 gallons per day of twenty-four hours will pass through a small hole, made with an ordinary pin, in the pipe; through an aperture of $\frac{1}{16}$ in. diameter, pressure 58 lbs., the discharge was at the rate of 524 gallons; when the aperture was increased to $\frac{1}{8}$ in. diameter, the waste was 2,880 gallons for twenty-four hours. All these experiments were made with a $\frac{1}{2}$-in. pipe, within 25 ft. of a 6-in. service main. Dealing with larger orifices, the President found that the waste through a $\frac{1}{2}$-in. tap was 16,416 gallons, and through a $\frac{3}{4}$ in. tap as much as 27,360 gallons during the twenty-four hours, the pressure in both cases being 59 lbs. per square inch. The last instance represents a cost of 250*l.* per annum, taking the price of water to be 6*d.* per 1,000 gallons. Among the other papers published in this volume may be mentioned one by Mr. R. Manning, on "The flow of water in open channels and pipes," in which most of the more important formulæ in connexion with the subject are examined and compared. Mr. J. P. Griffiths also contributes a paper on "Standard Tests and Specifications," which is well worthy of careful consideration.

A RECENT number of the *Chicago Times* gives an illustration of another of the great tower-like buildings which will apparently become before long a characteristic feature of the architecture of United States cities. It is called (in the new language the Americans are inventing) "The Germania Theater Building," and is to be erected by a syndicate of Germans resident in Chicago. The design is not deficient in architectural power. At the base is an entrance-screen in two stories running across the whole frontage, the ground-story showing a wide entrance with columns, and a shop-front on each side, with a niche for a colossal statue between the shop and the entrance on each side. Above this is a richly-decorated arcaded loggia with a cornice about 30 ft. from the ground (judging by the scale of the figures introduced). Behind this rises an immense tower divided by piers into three vertical compartments arched at the top; between the piers are the windows, plainly treated and all alike, showing twelve stories in this portion of the building. The top of the tower is finished by a band of richly-decorated wall-surface including another open loggia, furnishing a further story, and above is a widely-projecting cornice with a decorative balustrade over it. A small lantern with a cupola rises from the middle of the roof. The side portions of the tower are kept at about half the height of the centre, with similar but smaller enriched cornices stopping against the sides of the main tower, and treated in front with a lofty bay running nearly the whole height of this portion, and finishing with a balcony beneath the top story. Behind the tower a lofty block of building, also with a large enriched cornice just below the level of the main lower cornice, runs back and connects the composition with a similar tower at the back of the site. The Chicago paper (like too many English newspapers in this respect) does not trouble its readers with the name of the architect.



Old Timber House, Drogheda: removed in 1825.
(From an illustration in the Journal of the Royal Society of Antiquaries of Ireland.)

WE have received from Messrs Büscher & Hoffmann, of Eberswalde, an illustrated pamphlet of their method of applying asphalte in sheets or tablets ("plaques d'asphalte") either for the covering of roofs or for the formation of an impervious layer against damp. These plaques were patented by the inventors in 1855, and have been since then considerably improved. They are composed of asphalte bound together by a fibrous tissue (the nature of the fibre is not stated), which is stated to considerably augment the resistance of the asphalte to breakage or cracking from any kind of strain. According to experiments tabulated by the patentees, a plaque of this kind will bear a tensile strain extending its length in the proportion of ·04 without the plaque suffering any injury or any breakage of continuity, but they state that official experiments made at the École Polytechnique of Berlin have shown the material to have an extensibility under tensile strain ranging from ·1 to ·2 of the entire length. The advantage of such a material in building operations is that it can be laid, the plaques overlapping each other at the joints, or made with halved joints, with the same facility as slates, and a defective piece taken out and replaced at any time. According to letters and testimonials included in the printed circular of the patentees, the material appears to have been extensively used in Germany with satisfactory results, and it certainly seems worth the attention of architects in this country.

THE fire at Lord Romilly's residence, caused by the upsetting of a paraffin oil lamp, is similar to many that have already occurred. But the position of the gentleman who lost his life through the accident has caused public attention to be directed to it more closely than would otherwise have been the case. There are some practical points which this accident suggests. The first is that if people are to go on using,—as they certainly will do,—mineral oil, it should be used in as safe a manner as possible. In other words the lamps should be constructed so as to be as little liable as possible to be overturned, and should be placed as far as possible out of reach. At present lamp-makers produce lamps of various forms and sizes, and in many fantastic shapes. A large number of these lamps are of a very unstable design. A lamp as nearly "unoverturnable" as may be should be the object of the practical lamp maker, and the prudent householder should take care that he obtains lamps which are thoroughly well balanced. It is equally obvious that hanging lamps or those placed on wall-brackets are safer than those standing on tables,—especially on small tables, which are probably the most dangerous of all. Of course, the nature and standard of the oil used is very important, but this point is one which has nothing to do with the construction and position of the lamps.

THE last issue of the Quarterly Journal of Proceedings of the Royal Society of Antiquaries of Ireland contains an article by Mr. W. Fraser on "Half-timbered Houses in Dublin and Drogheda," with one or two illustrations. According to Mr. Fraser, all work of this class in Ireland has been destroyed, the last timber house of any note in Drogheda having been pulled down in 1825. We give a reduced representation of this curious house from the cut given in the Society's Journal. The material was Irish oak, and the house bore the inscription on the bressumer: "Made . by . Nicholas . Bathe . in . the . year . of . our . Lord . God . 1570 . bi . Hiv . Mor . Carpenter." Each word was divided by a star. The last of the Dublin street houses of timber was removed a few years earlier; an illustration of it is also given. It bears a considerable resemblance to various old London houses of the same class.

BY instructions from the trustees of the Earl of Hardwicke's Estate Act, the home portion of the Wimpole estate, in the counties of Cambridge and Hertford, is placed in the market. This property extends in all to nearly 10,260 acres; the deer park, in which is a fine avenue, nearly 2¾ miles long, of elm trees, lies just north of the old Roman-road from Arrington Bridge to Barton and Cambridge. Wimpole comprises various manors that eventually came into possession of the Chicheley family, who settled here *temp.* Henry VI. From John Chicheley of Higham Ferrers, the archbishop's great-nephew, they passed to Sir Thomas Chicheley, who in 1686 sold them to Sir John Cutler. In 1710 the property was bought by John Holles, Duke of Newcastle, of Lord Radnor, who had married Cutler's daughter. Philip Yorke, Lord Hardwicke, and Lord-Chancellor, bought it, in 1739, of Edward Harley, second Earl of Oxford, and his wife, only daughter and heir to the Duke. The central portion of the hall, of brick, was built by Sir Thomas Chicheley *circa* 1632: Lord Oxford added two wings, and employed Sir James Thornhill to paint the chapel. Lord Hardwicke had the house newly fronted, and re-fitted the principal rooms. In 1791–2 some alterations and additions were made by Sir John Soane. Prior, the poet, frequently visited here in Lord Oxford's time, and his portrait was added to the gallery, which already contained Van Dyck's Richard Earl of Warwick, Jansen's Ben Jonson, and Kneller's Bishop Burnet. In the St. Andrew's parish church, as rebuilt, excepting the chantry chapel, in 1749, of red brick, after Flitcroft's designs, is Scheemakers's monument, with medallion portraits, of the Lord Chancellor Philip, his wife, and their son Charles (also Lord Chancellor, who died before his patent as Lord Morden was completed) executed after J. Stuart's design. There are other monuments to the second Earl, his brother Joseph, elevated Lord Dover, and, in the chapel, to Sir Thomas Chicheley, who died in 1616. The windows contain several coats-of-arms, by Pecket, of the Yorke family and their alliances. Most, if we remember aright,

of Lord Hardwicke's collection of pictures from Wimpole, were sold at Christie's on June 28-30, 1888. The sale included Hogarth's and Sir James Thornhill's painting of the House of Commons in 1730, with portraits of Speaker Onslow, Sir R. Walpole, Sidney Godolphin, and Sir James Thornhill,—who sat for Weymouth,—(Thibaudeau, 105 guineas). Also the following, bought for the National Portrait Gallery:—Kneller's portraits of Thomas Parker, Earl of Macclesfield, and Charles Montague, Earl of Halifax; and Benjamin Ferrers's painting of the Court of Chancery in Westminster Hall, *temp.* George I., with portraits of Lord Chancellor Macclesfield, Sir Philip Yorke, then Solicitor-General, and Sir Thomas Pengelly, King's Prime Serjeant (115*l.* 10*s.*). Dr. Lort gave this last picture to Lord Hardwicke. A view of the Hall will be found in Vol. I. of Moule's "English Counties Delineated," 1837.

SOUTH VILLA, in the Inner Circle, Regent's Park, has been placed in the market for sale by private treaty. The grounds, 10¾ acres, together with those of the adjacent St. John's and the Holme, extend to the lake in the park. It is of interest to note that at this villa Mr. George Bishop, F.R.S., built for himself an observatory in 1837. There during many years Mr. J. R. Hind conducted his observations of the asteroids between the orbits of Jupiter and Mars, his labours being rewarded by the discovery of ten, beginning with Iris on August 13, 1847, and ending with Urania on July 22, 1854. St. John's, long known as the residence of the late Sir Isaac Goldsmid, and now the Marquis of Bute's, was for the most part designed and built, in 1830-1, by Decimus Burton, who built also St. Dunstan's Villa, 1832-7,—the late Lord Hertford's,—Holford House for Mr. James Holford, 1832-3, now the Regent's Park, late Stepney, College, and laid out the Zoological (1826-40) and the Botanical Gardens (1840-59). James Burton, his father, designed and lived in the Holme. About sixty years ago J. Wilson Croker went to St. Dunstan's for a day's sport in the park, where at that time were hares, pheasants, and partridges.

WE have received a photograph of the trowel with which the Queen laid the foundation-stone of the Derbyshire General Infirmary (illustrated in our pages last week) on Thursday the 21st. The trowel was made by Messrs. Johnson & Son of Derby, from a design furnished by Messrs. Young & Hall, the architects of the building. The trowel is made of solid silver gilt, and the handle of ivory, with a bas-relief of "Charity" cut out of an oval sinking in the handle so as not to project beyond the general outline of the handle; the sinking, with a slightly-raised fillet, forming a frame to it. The handle is surmounted by the Imperial crown. The face of the trowel is decorated with delicately-chased scroll-work with the Royal Arms in the centre and the county arms below, and on either side small engraved figures representing respectively St. Luke and Æsculapius; round the margin is an inscription commemorating the occasion. This is a better and more artistically-designed work than ceremonial trowels, keys, &c., made for such occasions, usually are, it is in good and refined taste throughout. The only little point we object to is that the two quatrefoil leaf-forms which make the attachment of the handle to the blade do not harmonise with the circular lines of the head of the blade; they should have been made circular and have been worked into the lines of the blade and its decorative scroll-work; as it is they do not appear to fit their place. But it is gratifying to see so good an attempt made to introduce artistic style and refinement into an implement of this kind.

IN our column of Foreign news, under the head of "France," we have the pleasure of announcing that Mr. Waterhouse has just been elected a Corresponding Member of the Académie des Beaux-Arts of France,—another among various proofs of the estimation in which his character and abilities are held on the other side of the Channel.

ARCHITECTURE AT THE ROYAL ACADEMY.—V.

1,791. "Trinity United Presbyterian Church, Pollockshields, Glasgow;" Mr. W. G. Rowan. Rather a novel and effective treatment of the end of the church, which is flanked by two lofty octagonal turrets, solid below, and rising into open-work stages above. A well-executed pen drawing.

1,794. "St. Mary's Church, Stamford; Chancel Screen;" the late John D. Sedding. A water-colour drawing of an elaborate rood-screen with the usual open arcade, traceried heads, and cornice carried out on imitation vaulting; but above this is another stage with a second cornice, and seated figures in front of a background of rich panelling; the centre compartment is raised and has a crucifix with two figures standing beneath the arms of the cross. The effect of the whole is fine and original.

1,795 "New Premises, Chester;" Mr. T. M. Lockwood. An angle group in one of the Chester Rows; the portion adjoining the angle is treated in masonry in more or less Elizabethan style, with open circular arches to the Row; at the two extremities of the composition the timber work characteristic of old Chester is introduced, and the Row openings are covered by wooden lintels. The treatment is varied at each end. The effect of the whole is picturesque and the drawing, tinted in sepia, a good one. We presume no local Building Act interferes with the modern adaptation of half-timber architecture in the streets of Chester. Architecturally this is a gain for the moment; it may be doubted whether it is best in the long-run, either for the sanitary condition of the city or for the value of the property.

1,797. "The Nativity: painted in the centre of a triptych at St. Paul's, Wilton-place:" Mr. N. H. J. Westlake. Illustrated in our present number (see lithograph). A pencil drawing of a well-composed group, in which the faces and draperies have been carefully studied, but the infant Jesus is a figure of rather stiff and Mediæval character, a criticism which does not apply to the rest of the composition.

1,798. "Zephaniah: Twelfth-century Byzantine Mosaic, Daphne, Athens;" Mr. R. W. Schultz. A companion drawing to No. 1,773. The drapery is much more free and classical in style, and less diversified with colour and ornament than in the other case.

1,799. "Whittington Hall, Staffordshire, Restoration;" Mr. M. H. Holding. A pretty pen drawing of an interesting old house partly castellated in character and partly half-timber in another wing; but there is nothing to show wherein the "restoration" consists, or what is old and what new.

1,802 "Scheme for Decoration in Coloured Gesso;" Mr. H. W. Batley. A clever little upright panel of a marine *motif*. There is a base ornament with a row of conventional shells, over this the surface is diversified by flowing lines conveying the idea of water, and two little sea nymph figures appear to float on it, crossing each other. Above is a bit of wall ornament and a wreath. A pretty fancy worked out in a decorative manner.

1,804. "The Tower of the Church of St. Jean, Maestricht;" Mr. John B. Gass. A carefully-drawn elevation and section, which we had the pleasure of publishing in the *Builder* of December 3, 1887.

1,805. "Design for a Hall: Interior;" Mr. J. Armstrong Stenhouse. A small coloured perspective of a "marble hall" of Renaissance detail, of spirited and free design: evidently intended as the lower hall to the staircase interior shown in No. 1,777.

1,806. "Crooksbury near Farnham;" Mr. Edwin L. Lutyens. We presume this is a new house, though it is made to look very much like an old one both in style and in the manner of drawing. It is decidedly picturesque; an L-shaped house, one return with plain stone walls and small cottage-like windows, the other partially half-timber work. A plan is added. We should imagine some of the rooms rather insufficiently lighted, though the small windows look very pretty and homelike from the outside.

1,807. "Design for choir-stalls, St. Albans Church, Teddington;" Mr. A. H. Skipworth. A very delicately-executed tinted elevation of richly-worked choir-stalls and canopies of Late Gothic type, with much elaborate tracery The backs of the stalls are decorated in colour, apparently textile work. The details are all such as may be taken from old Gothic work. Rather a pity that the designer of a thing in such good taste should not also have endeavoured at some little modern and original treatment in the architectural detail, which might have been done without necessarily putting it out of harmony with the building in which it is placed.

1,809. "Design for an altar cross, silver gilt enamelled;" Mr. G. P. D. Saul. A large and elaborate coloured drawing, which however we cannot very much admire. It shows a Latin cross expanding into a square at the ends of all four arms, the squares bearing the emblems of the evangelists. As the lower one is the foot on which the cross stands, it looks awkward to treat it in the same way as the extremities of the other three arms; and the base on which the whole rests, with small lions for feet, is somewhat squat and ungraceful in form. The manner in which open metal work is used to form a kind of circular nimbus round the centre of junction of the arms of the cross is the best part of the design. The figure of Christ is placed so that the head forms the centre of this nimbus. The central portion of the ground of the cross and of the four square panels is filled with blue enamel which has rather a gaudy effect.

1,812. "New Offices, Fenchurch-street;" Messrs. Maclaren, Dunn, & Watson. There is some originality of detail in this pleasing little coloured elevation, especially in the manner in which the long pilasters, running through the first and second stories, break off at the top into spreading foliage, instead of ending in an ordinary capital. The ground story is of grey granite (?), the upper part of cream-coloured stone, with large circular-headed windows on the first and second stories, and square-lined windows forming a kind of attic over, in which a certain novelty of detail seems suggested in the architraves, but too slightly sketched and on too small a scale to say exactly what is intended. There is however both good taste and originality in this elevation, unpretending and quiet as it is.

1,813. "Carved Boss from Chapter House, Southwell;" Mr. A. H. Powell. Noteworthy as a very good bit of colour.

1,816. "Detail of new Reredos, St. Peter's Church, Bushey Heath, Herts;" Mr. Jas. Neale. A section should have been added to explain the treatment of the pinnacles and buttresses &c., which is not quite evident from the elevation. The architectural portion of the design consists of rather heavy but solid-looking crocketted gables with a cornice rising over them, the top battlemented finish of which does not seem quite in keeping with the rest of the detail. The architectural design leaves three compartments over the altar, painted with the figure of the Saviour in the centre and angels in the side compartments, presumably intended for mosaic; the colouring is rich and harmonious. The symbols of the Evangelists are worked into double triangles in a panel at each side, forming a kind of supplement to the main composition.

1,817. "Chartres Cathedral: West Doorway;" Mr. H. Wilson. A slightly-executed but able water-colour sketch of the sculptured portal and its figures. Is the door itself really as green as represented here? It serves to give the key-note for a certain special colour-tone in the drawing.

1,819. "Additions to Grove House, Harrogate;" Mr. Butler Wilson. Two well-executed pen drawings, of which the one shows a house with a picturesque arrangement of gables and half-timber work, the other, showing the other side of the same house, shows a more square and formal architecture. A plan is appended, on which the distinction between the old and new work is apparently indicated by light and dark tinting, but the drawing is hung too high to make it out, or its reference to the perspective views.

1,818. "West End, St. Michael's, Smethwick;"

Mr. A. E. Street. This is apparently the church the font from which is illustrated in drawing No. 1,880 in the exhibition (published among our plates this week). The west end of the church shows a square brick tower rising from the ground without plinth or base moulding, and perfectly plain except for an arcade in the upper story, diversified by the introduction of stone courses in alternation with brick. Over the tower, rising from behind a parapet, is a short red-tiled spire. There is a certain severity about the design, partly suggesting the idea that economy has ruled in its production; but the low lean-to piece of building across the front is awkward and unsightly in appearance, and we cannot very much admire the work as a whole.

1,822. "Proposed house to be built at Hampstead;" Mr. R. A. Briggs. This is a very good specimen of the revival of the style of the old London suburban house, with rusticated door pilasters and angle-quoins, and diversified by a rather original treatment in the semicircular bay windows in each wing, with apparently solid stone roofs (segmental in vertical section), and columns between the windows. If these bays have, as appears by the drawing, jointed stone roofs, how is it intended to keep wet out? Between the wings and the narrow projecting centre are recesses with columns in front on the ground floor, leaving balconies over. The whole effect is at once solid and picturesque, and the drawing (in pen-line) a good one.

1,821. "St. Mary's, Stoke Newington: Tower and Spire;" Mr. John O. Scott. A large pen-drawing of an adequate modern Gothic tower and spire, presenting no features out of the common; it is of course well done, but we fear this reproducing of Gothic towers and spires is getting rather played out now. The best point in the design is the junction of tower and spire, the low octagon angle-turrets with their high pinnacles producing a good effect. The lucarne windows at the base of the spire are made of some importance in the grouping, with high pinnacles over them growing some distance up the face of the spire.

1,824. "St. Antonien Kapelle, Berne: as restored;" Mr. Reginald Blomfield. This is a fine bold sepia drawing of an old building restored to what we presume the architect believes to have been something like its original condition, and (unlike many other exhibitors of "restored" drawings) he adds a small sketch in the corner showing the state of the building before he dealt with it. It shows there a curious massive battered basement and a low story with ordinary square sash-windows above, apparently cut short by the modern flat roof with projecting eaves. In the restoration this part is carried to double the height, and the windows finished with pointed arches and tracery in the heads, but with the lights divided up into small square panes; the wide projecting eaves are retained, but with a high-pitched roof over them, and a flèche at one angle. It is an interesting bit of picturesque architecture shown in a very effective drawing.

1,825. "North-east view of St. John's Church, Cardiff;" Messrs. Kempson & Fowler. A solidly-executed pen-drawing of a large Gothic church of orthodox type with a square tower, very plain except for the richly-treated and picturesque parapet and open angle-turrets. The plan is an unusual one, the nave, with five aisles, spreading out wider than its length; it ought to produce a good interior.

1,827. "Proposed Country House, Cheshire;" Mr. E. Hodkinson. A good water-colour drawing of a bold-looking red-brick house with two large gables to the front, and a wide round-arched recessed porch, which gives a hospitable expression to the building.

1,828. "The Red Drawing-room, Aston Hall, Birmingham:" Mr. Alfred E. Hewitt. A good water-colour showing the interior of (we presume) an old room, chiefly remarkable for its rich and elaborate plaster ceiling.

1,829. "Parish Church of Waterloo, Lancashire;" Messrs. Paley & Austin. One of the finest pen-and-ink drawings in the room, remarkable for its clear and bright effect (the result of clean lines, touches put in where they are wanted and nowhere else, and plenty of untouched spaces), and exhibiting one of the best bits of modern Gothic in the exhibition. Observe the massive effect obtained by simply producing the side walls into buttresses at the east end, with nothing to break the line of wall. Though the style is Mediæval Gothic, there are touches of modern feeling in it, as in the employment of circular or rather elliptical heads to the tracery-lights in many places. The nave is lighted by large clearstory windows under horizontal labels, but the spandrels filled up with solid tracery; the buttresses shallow and wide and ending in a simple set-off. The tower is a very fine and solid one, square in form with a large staircase turret at the south-west angle; the upper stage with windows in double lights in two stages, or rather a four-light window, very simply treated with mullions and segmental heads to the lights, which are filled with louvre-boards. The parapet is richly decorated with panelling and tracery. There is a look of solidity and dignity about the whole, combined with some richness of effect, which is most satisfactory.

1,830. "Head Office of the Hong Kong and Shanghai Banking Co., Hong Kong;" Messrs. Turner & Palmer. This perhaps merits notice as a building carried out in China with Classical details, but it is a curious affair. The finials seem to have been designed with some intention of giving an exotic and Pagan-temple effect to a building mostly made up of the ordinary materials of Classical banks; at any rate the effect of the whole is odd and unwieldy.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The fourteenth ordinary meeting of this Institute for the present session was held on Monday evening last, at 9, Conduit-street. Mr. James Macvicar Anderson (Vice-President) in the chair.

Obituary.

The Secretary announced the decease of Mr. Harry Oliver, Fellow; Mr. Alexander Peebles, Fellow; Mr. Thomas Verity, Fellow; and Mr. Henry Curzon, Associate.

The Chairman said that fortunately it was not often they had to regret such a large number of deaths, which were partly the result of the influenza epidemic. He was sure all the members received the announcements with very deep regret. Mr. Verity he happened to know a little of. Having had one or two transactions in business with him, he had formed the opinion that he was an extremely straightforward and able man—a man in whom he had the utmost confidence. Mr. Peebles he had not the pleasure of knowing personally, but he filled a very important and prominent position—that of City Architect—although only for a short period, and it was a singular coincidence that he seemed to have died on the fourth anniversary of the death of his predecessor, their old friend, Sir Horace Jones. Mr. Harry Oliver he remembered as having been a member of the Council in days gone by. It was with very great regret that they had to make the intimation of so many deaths.

Some Churches in the Neighbourhood of Cleves.

Mr. H. W. Brewer then read a paper on this subject, of which the following is an abstract:—

The author thought that no district in Germany had received less attention at the hands of the English archæologist and architect than the old Duchies of Cleves-Berg. Some twenty years back* he read a paper before the Institute upon the condition of architecture in Germany, and had expressed a hope that it had a great future; and signs were not then wanting of great progress. He was bound to acknowledge, however, that the modern architecture of Cologne showed little or no advance, for while architects in England had made great strides, especially in the adaptation of Gothic and Renaissance detail, the new street architecture of Cologne seemed to be devoid of any interest, and about on a level with that of Bayswater thirty years ago; while hundreds of fine mediæval Gothic and Renaissance houses, which had offered excellent suggestions for modern work, had been swept away to make room for dull and commonplace buildings. The one exception he noticed was a new gallery and staircase at the Hotel Dische. The old walls of Cologne had disappeared, but two old gateways had been spared.

The old abbey of Altenberg appeared to be better known in England than in Cologne; after numerous inquiries, he found it was sixteen miles distant, and after driving through a wild and picturesque region, on arriving at the top of a great hill, Altenberg was to be seen some 200 ft. below. His first feeling was one of disappointment. The west front was a somewhat hard and dry example of German fourteenth-century work. Some good sculpture was to be found, however, about the western doorway. Altenberg had been a Cistercian abbey, but all that was left of what must once have been one of the most stately abbeys in Germany was the great church, the abbot's chapel, and a few uninteresting farm buildings. The abbey church bore a remarkable resemblance to Cologne Cathedral; some German writers called it the "Parent of Cologne," and it had been set down as an earlier work of the same architect. But, although it looked the earlier of the two, it was not so, as the choir of Cologne had been commenced in 1248 and consecrated in 1322, whereas Altenberg had not been commenced till 1255, and its date of completion, as given by Kugler, was 1379. The whole design had a more northern treatment than that of Cologne, and he did not hesitate to say that, as far as the interior was concerned, Altenberg was the more beautiful.* Its noble proportions, stately dimensions, and the exquisite glass with which all the windows were filled, rendered it well worthy of a visit. Having described this glass in some detail, Mr. Brewer said he considered modern work would be far better for more of the architect and less of the painter; and that stained glass windows formed inappropriate memorials to the dead. Although Altenberg was almost denuded of furniture, the old altars remained, as well as a grand series of monuments to the counts of Berg and mitred abbots.

In the ancient town of Neuss, the "minster"† was a noble example of architecture of the twelfth and thirteenth centuries. Its design was purely German. The plan showed a single eastern apse, with two others at right angles, all three opening from a crossing which was crowned by an octagonal lantern; to the west was a nave with double aisles, and a large square tower flanked by transepts. The arrangement of the choir was somewhat singular and also suggestive; it occupied the eastern crossing, but instead of the side apses being cut off by screens, the stalls were placed against the walls of the two apses, and the high altar was placed under the crossing. The treatment of the construction, interior and exterior, having been described, the author next dealt with the handsome old town of Emmerich, which was quite Dutch in its characteristics, especially referring to the two old churches called the "Old Minster" and the "New Minster." The former was singularly planned, and he could only describe it as a great north transept with a very small nave, a low chancel, and a short south transept attached to it. The whole building was of brick with stone very sparsely used; and quite Flemish in character. The chancel was probably tenth-century, and the north transept was, he fancied, fifteenth-century work. The other church consisted chiefly of a vast nave and aisles of the plainest fifteenth-century Gothic of the Dutch type, with a lofty brick tower crowned by a lantern. Except its great size, there was, however, nothing particularly interesting about it.

The town of Cleves contained three ancient churches, the principal of which, the collegiate church, crowned one of the hills, and at a distance was a striking-looking building. The date of its completion was 1334, and the material used in its construction was somewhat singular. The walls were of red brick with stone dressings; but in some places they were banded with a kind of artificial stone, which was used in such an irregular manner that it was a question whether it was not the material of some older building worked up. Another curious feature was that all the clearstory windows were blocked up, their traceries showing only on the interior. The old Dominican church in the lower part of the town was a very plain brick building of Dutch type, but containing an extremely beautiful set of choir-stalls. About three miles from Cleves was a village church called Wissel,—a most perfect example of an unaltered twelfth-century building. The modern German decorative painter had unfortunately had full scope here, and the walls were covered with the horrible metallic green

* See *Builder*, vol. for 1871, p. 918.

* For description and interior view of this Abbey Church, by Mr. Brewer, see the *Builder* for June 21, 1890.

† Or Church of St. Quirinus. For description and exterior view see *Builder* for June 9, 1890.

and hot orange tones which seemed to delight German eyes.

Calcar was a pretty old Dutch-looking town with Mediæval fortifications of brick, and a lofty but very plain church of Flemish appearance. It was probably one of the most richly-furnished churches in the whole of Europe, and contained seven altars, each with a most magnificently carved and painted reredos.* It was impossible to see the carvings and paintings at Calcar and other churches in the neighbourhood without being impressed with the fact that the school was one that possessed great merits, and that well deserved study.

About eight miles from Calcar was Xanten. The author considered it scarcely an exaggeration to say that Germany did not contain a more interesting church than the minster of St. Victor in that town; and having referred to other buildings in the town, he proceeded to describe very fully both the exterior and interior of the minster.† The plan deserved especial attention, on account of the arrangement of its eastern termination, which was a very valuable and interesting example of the problem which the German architects at the end of the thirteenth century tried to solve,—viz., "how to terminate a church to the east by a group of apses in such manner as to avoid the French *chevêt* and radiating chapels." The nearest approach to a solution was the Liebfrauenkirche at Treves, the eastern portion of which was almost identical with that of Xanten, and of which Xanten was, perhaps, a copy. The author dealt at some length with this subject, and then turned to the interior of the minster, which, he said, was wonderfully striking, with the clustered columns, richly carved capitals, enriched cornices, lofty clearstory, noble vaulting, the beautiful perspectives produced by the double aisles, the stained glass, and the magnificent old church furniture, all of which were described in considerable detail. He also drew attention to the great beauty of the roofs of the church and adjacent buildings, a good deal of the slating of which he believed was original. The high-pitched roof of the nave was adorned with very pretty dormers with lead finials, the slates being all laid obliquely with those covering the flashings scalloped and reversing the general line. In contrast with modern English roofs the Germans evidently studied their roof-coverings carefully and treated them artistically. It puzzled him to determine to what particular school the architect of Xanten had belonged, but he fancied he must have been a South German; and as Xanten had been a famous pilgrimage church, it was highly probable that the architect had been called in from a distance.

Mr. Charles Fowler proposed a vote of thanks to Mr. Brewer for his interesting paper. He had taken them to a district with which probably very few were acquainted, and he (Mr. Fowler) did not intend to make any remarks upon the paper. There was one remark, however, in it with which he thought most of them would not agree. Mr. Brewer regretted that the modern, or at least recently-built, spires of Cologne Cathedral were not put upon a modern building instead of upon an ancient one. Mr. Brewer was aware, as they all were, no doubt, that those spires, although carried out in modern times, were of ancient design which had been almost miraculously preserved, and were carried out, he believed, exactly as was originally intended. They could hardly wish that spires or towers should be put anywhere than in the place for which they were originally intended. As to the effect of those spires, that was quite another matter. They did not admire all the ancient buildings which were erected, but certainly it was interesting to know that those spires and towers should have been completed according to the original design.

Col. Lenox Prendergast, Hon. Associate, said he would like to be permitted to second the vote of thanks to Mr. Brewer, whose paper was one of the most interesting he had ever heard read. Within his (the speaker's) own lifetime there had been a great development of Gothic architecture as applied in modern work; but to go into almost any of their own churches and see the interminable rows of admirably-executed open benches was to see a very tame and dull representation of what those great buildings originally were. Mr. Brewer had laid before them the peculiarities,—in fact, the *raison d'être*,—of those great Catholic buildings. The Catholic churches of old times contained a multitude of altars and a great amount of furniture. From a variety of causes these altars and furniture had been swept out of the great churches of Christendom. Alone apparently in such districts as that visited by Mr. Brewer would they find the churches as they originally were. Of all the destructive powers, wealth was, perhaps, the greatest. The changes of fashion had throughout the finest churches of Europe produced most admirable substitutes, it was true, but of a wholly different character to the churches as originally constructed. To him as a layman he confessed that he had often wondered to see, especially in the late Gothic churches of Germany and the Low Countries, such enormous pillars and architectural features, which appeared to him to be too bare, the truth being that those churches were now seen denuded of the furniture which they were intended to have, and, perhaps, did have at one time. There was just one question he would like to ask Mr. Brewer. There was a great deal of Renaissance furniture which found its way into these churches, and very interesting it must have been. He derived his knowledge of it from the admirable drawings by Mr. Brewer, which had appeared in the *Builder*. He could see that it was not with the sole object of showing the furniture that those drawings were made: but they showed some most beautiful Renaissance triptychs and altar furniture, of which we had so few examples. He would like Mr. Brewer to state whether he was right in supposing that those features actually existed, and how they could get to see either photographs or drawings of those most interesting features.

Mr. Arthur Cawston asked what Mr. Brewer meant by the apses all the way round the east end of the cathedral not looking well? Was it because they did not show up when one went into the cathedral, or was it that when they got to them and examined them one by one the effect was not good? Mr. Brewer also made some remarks about the big high-pitched roofs one saw over the big churches not looking well. He (Mr. Cawston) thought if they were high up, like that of Westminster Abbey, they were very effective, whereas if they were large and low down, like that of Westminster Hall, they were indefensible, and should be hidden at all costs. If only the roof was high enough he was not sure that grand lines were not almost better than seeing no roof at all.

The Chairman, in putting the vote of thanks, said that Colonel Prendergast had very rightly described Mr. Brewer's paper as a most interesting one. He had the misfortune of not knowing personally the buildings which Mr. Brewer had so minutely and so ably described. He was struck with one plan which Mr. Brewer sketched on the blackboard, which was described as particularly ingenious, clever, and original, though it was added that in spite of these qualifications it had the demerit of not producing a good effect. He (the Chairman) thought that was a characteristic of a good deal of work where originality was strained after. He fancied that there prevailed in the present day too great a straining after novelty, and that beauty was sacrificed to originality. Beauty ought never to be sacrificed to originality. Originality was all right and good enough in its way, but if it could only be attained at the cost of beauty it had better not be attempted. Mr. Brewer had apologised in a manner for the severity of his strictures upon stained-glass. Certainly his strictures were somewhat severe; whether they were too much so he was not prepared to say. He thought, however, that artists in stained glass were very apt to forget, as Mr. Brewer had said, that they were dealing with glass instead of with paint, so that very frequently "memorial" windows were far from beautifying the buildings which they were intended to adorn. From what Mr. Brewer had said, it appeared that jerry-building was not peculiar to London. Mr. Brewer had told them that many of the old and interesting buildings in Cologne had been removed to make way for modern works in which the jerry-builder had full scope. They had many instances in London where buildings had been removed and replaced by modern and very inferior buildings. An apt illustration might be quoted at the present moment. They had been endeavouring to preserve a building of considerable interest, and one of the few buildings in London by one of the most accomplished architects of the present century; he referred to Professor Cockerell's Hanover Chapel, Regent-street. The House of Lords had, unfortunately, passed the Bill for the removal of the church, but it had yet to pass the House of Commons, and there was a chance of yet saving the building if sufficient efforts were made. Whether they would succeed or not remained to be seen.

The motion was then put and cordially adopted.

Mr. Brewer, in reply, said he had first of all to thank the meeting for the extremely flattering way in which they had received his paper. Of course he was not a practical architect, and he merely regarded architectural works from their appearance, as they would strike one of the public who had what were called artistic tastes. Therefore, in the buildings he had criticised there might be certain constructive merits and advantages which he was incapable of understanding. With regard to the spires of Cologne Cathedral, it was perfectly true that the original design of those spires was discovered by Zwirner. It was found in two different places; part of it in Paris, and part of it under a beehive in the neighbourhood of Cologne, and put together. But he (Mr. Brewer) was not quite sure, in looking at the drawing which now existed in Cologne Cathedral, that there was not a good deal of Zwirner in it, and he felt perfectly convinced of one thing, that the old men would never have carried out that design. He was borne out in saying that from a fact which he noticed at the Cathedral, and that was this, the north-western tower had very considerably departed from that design before the recent works took place. Part of these marks were destroyed, and he looked upon that as a great misfortune. The design, he could not help thinking, was merely a tentative one,—perhaps one of a dozen others,—and would have been modified if carried out at all. He thought he might say as a certain fact that there was no cathedral of any size in Europe which had two towers and spires precisely and exactly alike. At any rate, he had never met with one, yet those at Cologne were carried out exactly and precisely alike, and the monotony which they produced certainly struck him as being somewhat painful.* Colonel Prendergast had remarked about certain Renaissance furniture which had been introduced into these churches. There were photographs in the room which showed the high altar at Xanten, and the extreme beauty of its very early Renaissance detail. But, although they called it "Early Renaissance," its outline was purely Gothic, and it was only in later times, when men gave up the Gothic outline altogether, that the effect seemed to be something totally different; in fact, looking at those early Renaissance altars, one would, without examining them, put them down as late Gothic work, and in some cases, Gothic work was very much mixed up in them. There was one curious feature to which he had not called attention, and that was the old super-altar. There were one or two super-altars existing at Xanten. He had heard it stated as a positive fact that the super-altar never existed before the eighteenth century, but here at Xanten was one of the fifteenth century. This super-altar was a movable feature—simply a box which held the candles, and was a work of very great interest. With regard to the apses arranged according to the German plan, he did not wish to be understood to say that they did not look well, but he did not think they were so effective as the French *chevêt* with radiating chapels, though they might be made as effective if they could be seen from the interior of the church as well as the exterior; and if anyone could solve that problem he would hit upon a new plan of church which he believed would be more effective than the French *chevêt*, but it would require a very clever architect to do it. With regard to high-pitched roofs not being effective, he thought that a high-pitched roof was an effective feature, but it required to be treated with a very considerable amount of care not to look clumsy. He certainly had seen many high-pitched roofs which

* For description and interior view of the church, by Mr. Brewer, see *Builder* for March 8, 1890.

† See the *Builder* for April 5, 1890 for view outside Xanten Gateway and view from the cloisters of the Church of St. Victor, Xanten; *Builder* for May 3, 1890, for interior view of the choir; and *Builder* for May 17, 1890, for view of altars in the south aisle, St. Victor.

* Some idea of the appearance of these spires may be obtained by the views given in the *Builder* for October 23, 1880, and May 8, 1881.

were extremely magnificent; those of the French *chateaux*, for instance, but then it must be remembered that they were broken-up with dormer windows and chimney-stacks. He thought a great unbroken high-pitched roof without any design about it was an unsatisfactory feature to crown an elaborate building.

Mr. J. M. Brydon: What is the colour of the slates?

Mr. Brewer said it was a very beautiful kind of grey, not unlike that which they found on old Kensington Palace. He was distressed when he heard of the proposed destruction of Hanover Chapel, which was the work of his old friend the late Professor Cockerell—to whom he really owed much, as he was exceedingly kind to him when he was a boy and greatly encouraged him in the study of architecture. He immediately upon hearing of that proposal wrote a letter to the *Builder*, and was thus, he thought, one of the first to call attention to the proposed act of destruction. In conclusion, he wished to thank the meeting once more for the kind way in which they had received his paper.

The proceedings then terminated.

HOME-LIKE HOUSES.*

THE love of home is an instinct possessed by man and the greater part of the animal world alike. It is perhaps the only sentiment which the reticent Englishman is not ashamed to confess to; indeed, it is his boast that the English language alone possesses the word "home" in its fullest sense.

Is it not strange, therefore, that, while all possess this instinct, the large majority of people are content to live in houses which are quite unworthy shrines of the household gods? The love of home exists still, but the love of the house has almost died out, or is lavished on a building which is quite undeserving. We have only to look round us and contrast the old houses with the new in order to see the truth of this.

Let us picture to ourselves the old Elizabethan house, quiet, dignified, and stately, as befits the age.

It is early morning on a bright summer day; the master of the house paces the long alley guarded by yew and box, or turns into the flower-garden, where the flowers, drenched with dew, give out a sweet, fresh scent; or it is late afternoon, and we see the head of the house sitting with his wife in the shaded arcade, while the children play on the terrace. The air is full of the scent of roses, and musical with the hum of bees; the shadows lengthen, the rooks sail slowly through the air; part of the house is in deep, cool shadow, and chimneys and gable-tops begin to glow like burnished gold. There is a sense of perfect rest and contentment; cares are forgotten for a time. Would it be wonderful if, in homes like this, men should grow noble and true, and the love of their home should become a passion? Can we wonder that they should cling to such homes, and feel that here indeed there is peace?

It is not only the mansion that fills its owner with delight. Take the farm-house on a summer evening, when the farmer is coming in weary with a day's toil in the fields. The cows are just being driven out into the fields after milking, and he hears the musical clatter of the milk-pails as he walks up the path, lined on either side with simple homely flowers in rich profusion. How cool the shaded kitchen looks, and how delicious is the faint smell of wood-smoke! He drops into his chair and is refreshed by the peace and quiet of home.

Old houses are all alike in this respect. How well we know the little prim house on the outskirts of a country town, standing back from the road, with a wall in front, and a high narrow iron gate with a straight path to the door. We grasp the spirit of the place at once, and know exactly what the owner is like; we can see all the furniture and china, and even smell the lavender and rose-leaves.

As we continue our walk, it is the same thing over again. There is the lawyer's house, and we know without being told that every room is panelled, and that there is a delicious garden at the back of it with fine old trees, and an octagonal white painted summer house somewhere at the end of a long path, and roses, and lilacs, and a hundred other sweet smelling flowers and shrubs.

I can imagine nothing which can give so keen a sense of pleasure as looking at an old English country house on a summer evening as the sun is setting. Then one can realise best the beauty of colour and proportion. The house and the garden seem the very incarnation of the spirit of home; all sounds are hushed, and peace and quiet reign supreme. How different is the modern "mansion!" Let us take one hap-hazard—there is no lack of examples.

First of all the entrance gate, red-hot with paint and gilding, with stone piers, topped either with lamp-posts or a borrowed crest. This opens into a drive, aptly termed "serpentine," and presently the house comes into view.

We seem to be able to tell at a glance the character of the owner of this house. Wealthy he undoubtedly is, and the house is apparently designed to advertise the fact to the world in general. The enormous conservatory is an outward and visible sign that priceless orchids are grown within, and many tropical plants, whose names and natures are unknown to anyone but the gardener.

The windows blink and stare at the sun, and the great sheets of plate glass look like molten brass.

The drawing-room is furnished *en suite* in blue or crimson, and he is a bold man who would dare to sit uninvited on any of the gorgeous chairs or sofas. See the garden from the windows: curved paths streaming like ribbons in all directions, manufactured undulations, "specimen" trees, and carpet beds, everything baking in the sunlight, and as neat and trim as three gardeners and a boy can make it.

No one can feel that this is home-like. The melancholy thing is that this result is not brought about accidentally; it is all deliberately planned and thought out, and may be taken as expressing exactly the spirit of the age. The owner is proud of it, and so, in a measure, is the neighbourhood.

Even more depressing than this is a walk in the suburbs of London. North, south, east, or west, they are all the same. There are only two styles of suburban houses, the gabled and the ungabled. The gabled is the most popular.

Take any one and examine it a little in detail. The height is generally considerably greater than the width. The windows of which the front mainly consists are of impossible proportions. There are, of course, a stone bay, with wooden sashes; a porch rich with brown graining, going halfway up the house; and bricks the colour of a London fog, with wiry streaks of red running through at intervals. A purple slate roof, with a formidable spiky iron ridge, tops the whole, and the house is complete.

Houses of this kind are stereotyped, and have enclosed London like a forest; thousands of people live in them and call them home, and I suppose they may also be considered as expressing the spirit of the age.

In every age and in every country the spirit of the time is shown in the homes of the people, and I am afraid that when future generations read our history from our houses, they will not see in them anything to increase their admiration for the spirit of the nineteenth century.

The house is so often built with too much regard to economy,—thin walls and floors, and a too close apportionment of space; or, on the other hand, it is loaded with ornament inside and out, and is more a vehicle for the display of the owner's wealth than a home.

It is difficult to say what it is that gives a house its particular character of homeliness; the character is there, but it is impossible to dissect the building and say, it is here or it is there; the home feeling is *everywhere* alike.

Breadth is, perhaps, the most marked feature in a home-like house,—the long, low building seems to fit better into the landscape than the house of many stories. The tower speaks of war and strife; and the nearer we approach to that form of building, the less is the air of homeliness.

To build a home-like house we must have the home feeling strong within us. It is no good to study old houses merely as pieces of architecture, sketching a corner here, or measuring a moulding there, and reproducing them more or less correctly. We must study the soul of the building as well as the body; indeed, it is the more important study of the two. Let us once grasp the spirit of the old homes, and we may express it in any outward form we please.

And now, having settled in our minds the ideal home, let us see how we should proceed to realize it.

We will begin with the obstacles. First the person for whom the house is to be built may be presumed to have no sympathy with our ideal; his wish is solely to provide a covering for himself and family which shall be convenient and economical. He will no doubt say, as so many do, that he is going to live inside his house and not outside; he will also have various ideas as to the disposition of certain rooms, and other matters of detail. As to these last, it is important to note any strongly-marked individuality and, if it is at all possible, to emphasise it and let it appear in the house. We will, then, suppose that you have been able to show him that a home must be more than four walls and a roof, and brought him into full sympathy with yourself.

It is important to do all this, but every one must do it in his own way; no one can lay down rules for the guidance of another.

Then we must see the place where it is proposed to build the house, and if we don't grasp it at once, we must go again and again till we do.

It is generally while we are looking at the site for the house, its prospect and aspect, the slope of the land, the positions of trees, roads, and neighbouring meadows, that a half-formed idea of the kind of house that would fit this spot floats into our minds; it is, of course, very vague and shadowy, but it is sufficient to turn our minds in a certain direction.

Having got a motive, our next step is to work it out, quite roughly at first.

Above all things we should avoid looking on a house as consisting of two parts,—plans and elevations. The outside and inside must be considered absolutely as one, and it should be impossible for us to say that the outside suggested the inside, or the inside the outside. We should now let our rough studies simmer a little, and then go more seriously to work. The actual drawings should be looked upon merely as diagrams, and we must avoid being led into the mistake of supposing that things which look well when well drawn will also look well in solid materials; everything should be thought of as *built* before we draw it, and if we have thoroughly made up our minds that this is what we are going to do, let us then draw it as well as possible. Drawing carefully will make us think carefully.

And now as to the general character of the house.

Home means, as I have said before, rest, quiet, and simplicity. Our house must, therefore, be restful, quiet, and simple. It does not matter how small it is: it can always be treated in a broad and simple manner, and have a quiet dignity of its own. A glance at any country cottage is sufficient to convince us of this.

I don't mean to say that a house must necessarily be bare and simple in every part, but simplicity must be the keynote. Certain parts, both inside and out, can, of course, be elaborately treated; but it must seem natural, and not an isolated, piece of work, and the reason for the elaboration must be apparent. It must, too, be borne in mind (although it sounds paradoxical) that elaboration to be effective must be simple, at any rate, in its main lines.

Another danger to be avoided is the deliberate planning of odd nooks and corners; let them come, if they will, naturally, like they did in old houses, and they will be very charming; but where they are purposely and consciously planned, they *always* destroy the repose of the house, and make one feel that it required an effort to produce them.

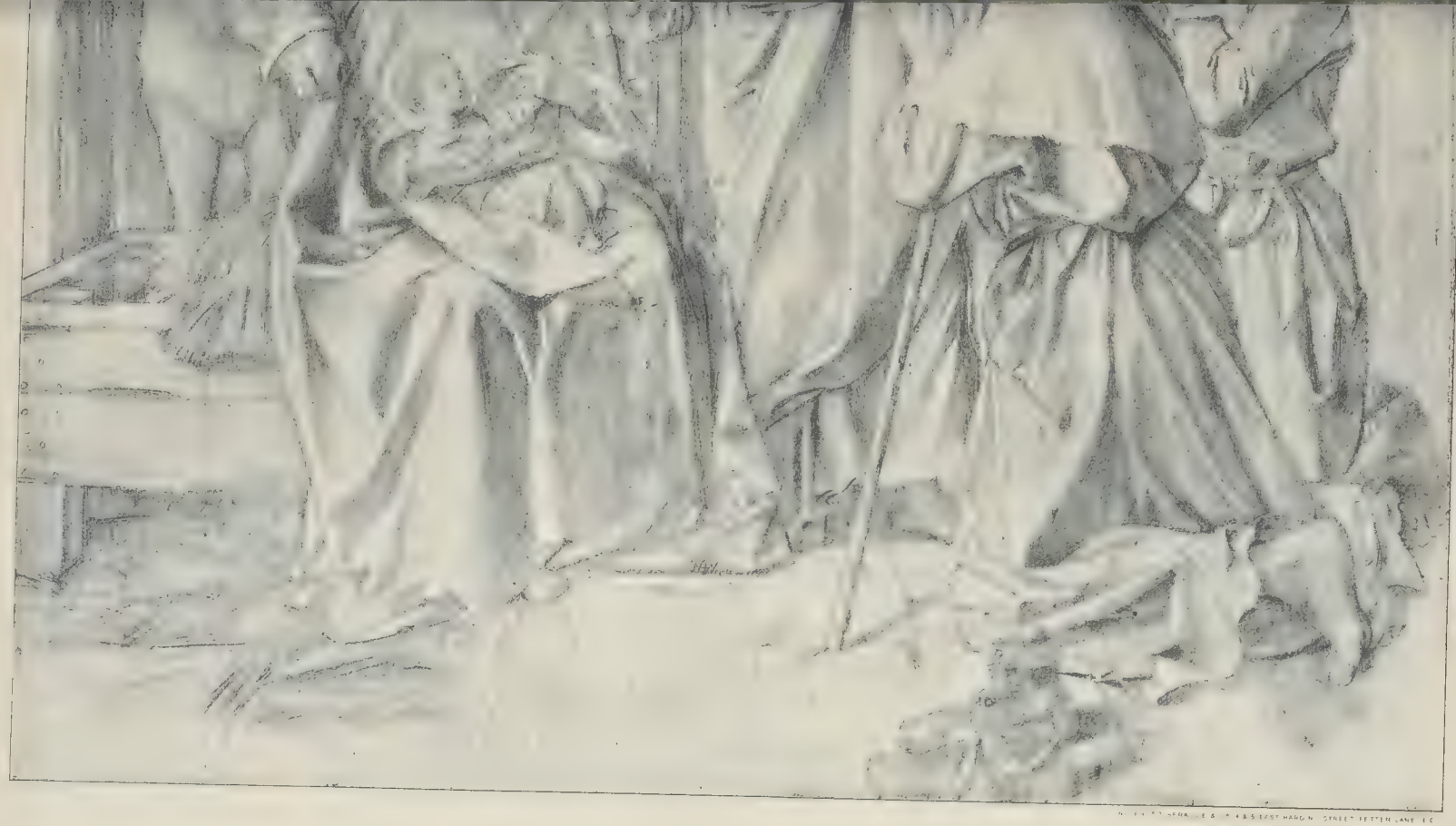
I am not saying anything about the convenient arrangement of the house; it goes without saying that a house must be convenient, but mere convenience is not sufficient. We must do much more for our house than that. It is unfortunate, perhaps, that the elaborate way in which we live nowadays demands a more complicated plan, and a greater subdivision of the house into various departments, than formerly.

Absolute privacy, when required, is undoubtedly necessary, and is, in fact, one of the charms of home; but it is a question whether we do not lose a great deal of picturesqueness by so entirely shutting off the working part of the house as we do.

The furnishing of the home should not be left to chance. We must contrive to arrange this as well as the house; the home-like character of rooms can very soon be destroyed.

* A paper by Mr. Ernest Newton, F.R.I.B.A. Read (in the unavoidable absence of the author) at the meeting of the Architectural Association on the 22nd inst., as elsewhere mentioned.





THE NATIVITY: CENTRE OF A TRIPTYCH AT ST PAUL'S, WILTON PLACE.—By Mr. N. H. J. Westlake.

No. 1797, Royal Academy Exhibition, 1891.

The garden, too, must be planned and schemed; it is as much a part of the *home* as the house itself.

In conclusion, I should like to emphasise a few of the remarks I have made previously, especially those bearing upon the home feeling. Unless we have this very strongly, it seems to me that it is impossible to give a house any life at all. Let us study old houses, not as inanimate buildings of more or less architectural beauty, but as expressing the most valuable and beautiful of human sentiments,—the love of home. Nowadays, when all religions are assailed, and we believe in nothing very strongly, it is almost impossible to make our churches express anything more than a sort of galvanised enthusiasm; we reproduce old forms as symbolical of certain legends, although we are not quite sure whether we believe them or not (I am only speaking generally, of course, as there are still many who believe strongly, and whose buildings express this belief very clearly). Belief in the sacredness of home-life, however, is still left to us, and is itself a religion, pure and easy to believe. It requires no elaborate creeds, its worship is the simplest, its discipline the gentlest, and its rewards are peace and contentment.

Mr. Beresford Pite, in proposing a vote of thanks to Mr. Newton, whose absence they all regretted, said that the only fault the paper had was its brevity, although, perhaps, they missed some of those "wrinkles" which they had been expecting to find in it. Mr. Newton had described very cleverly and very eloquently the charm of an old English house, and he had also depicted the horrors of modern houses. With a view of giving the discussion a practical turn, he (the speaker) would endeavour to refer to some points not touched upon in detail in the paper. As to aspect, the architect should always secure a good aspect for the best rooms of the house, wherever he had choice in the matter. No house could be home-like if the drawing-room faced due east, or if the larder were placed due south. The drawing-room should face south or south-west, and the dining-room should have nearly the same aspect. Wherever it was possible to do so, the windows of the principal rooms should be placed with some regard to any special features of the scenery which were visible from them, and if possible the views from the dining-room and drawing-room windows should not be the same. Where the house was a small one, and where the dining-room and drawing-room would occupy the front, it would be desirable to arrange the approach to the front door so that visitors would not have to pass immediately in front of the windows; but, on the other hand, neither should visitors be dragged in front of the kitchen window. Above all, he would invite those who were designing houses to, as a rule, give up the idea of "ingle-nook." He had never been in a drawing-room with an ingle-nook which had been properly warmed, or could be properly warmed, in winter, except with the aid of a heating coil. Another drawback of the ingle-nook was that it confined the fireplace to one side of the room. As far as appearances went, he thought that a fine Elizabethan chimney-piece, with carving and strap ornament, or a panelled or arcaded chimney-piece, looked quite as well upon the wall of a room as anything that could be put into an ingle-nook. Then, with regard to the windows of the principal rooms, it was desirable to study, not only their appearance from the interior of the room and the external views which they afforded, but also their disposition with regard to the lighting of the opposite wall. If the room were oblong in shape, the wall opposite the windows would be the principal wall available for hanging pictures; but those pictures would not be well seen if the windows were placed immediately opposite to them, and therefore an effort should be made to get the windows towards the ends of the room. Very frequently it might be found possible to design some feature, such as a bow-window, which would take off the awkwardness of an oblong-shaped room. There was no necessity for a dining-room to be always exactly the shape of a dining-table, only a little larger; nor was it necessary that a drawing-room should always be of the regulation type. A drawing-room that was L-shaped on plan would often be found very pleasing and comfortable. In small houses there might more often be a reversion to the adoption of means for throwing the dining-room and drawing-room into one for a dance or any other special occasion; but the old-fashioned, awkward, and cumbrous folding-doors should not be used. The doors should either be made to slide within recesses in the thickness of the wall, or at the back of battening or panelling. Another part of the house which might be made a more important feature than was usually the case was the hall, which, however, except in a very large house, should never be loftier than the dining-room. It should be treated as a room, in fact, out of which all the principal rooms should open. By making a feature of the hall, that miserable device, the narrow passage, could be dispensed with. He would advise them not to lay the floor of the hall with tiles; a wooden floor with a good Turkey carpet would be far better. The stairs should not project into the hall, but should start from a concealed recess, or from behind a screen. On the stairs, let them avoid cross-winders it was far better to use good quarter-space landings, and there should be a general feeling of homeliness about the hall and the staircase. In planning a bedroom they should always place the bed. Moreover, they should provide for the hanging of the door so that it might be opened without enabling any one passing up the stairs to see fully into the room. Another thing which should be taken into account in planning a bedroom was the provision of adequate space for the chest of drawers. With regard to the bedroom windows, they should not as a rule be lower than 3 ft. above the floor level, although, in rooms on the ground floor, the windows should come down to within 2 ft. of the floor level. He would advise them not to build external chimneys for the sake of either Queen Elizabeth or Queen Anne. When well done, they were very picturesque, but they were very expensive in coin and coal. Moreover, there were very few men, except Mr. Norman Shaw, who could succeed in making them look well when built. In planning a forecourt, with a carriage-drive, it was necessary to have a width of not less than 50 ft. in order to enable a carriage and pair to turn.

Mr. Bernard Dicksee, in seconding the vote of thanks, said the paper had been an exceedingly interesting one, and it had been supplemented in a very able manner by Mr. Pite. He (the speaker), however, did not quite agree with all that Mr. Pite had said, particularly as to the location of fireplaces. In rooms up to about 18 ft. square, he thought the fireplace might be very effectively placed across the corner. As to dining-rooms, every dining-room ought to be at least 15 ft. wide. In relation to semi-detached houses, there was one point to which sufficient importance was not given. In about every pair of semi-detached houses, one saw the sitting-rooms of the two houses only divided by a party wall,—too often a very thin wall. The consequence was that the noise of a piano being played in one of the houses could be distinctly heard in the next house. That evil might be avoided in semi-detached houses by placing the entrance-hall or passage, the staircase, and the kitchen, against the party wall, and by putting the sitting-rooms against the outer walls. One very essential requisite in a dwelling-house was rarely to be met with: he meant a handy hat and coat-room near the door. It need not be more than 6 ft. or 8 ft. square, and might be usefully combined with a lavatory.

The Chairman, in putting the vote of thanks, said that although Mr. Newton's paper was short, it was very suggestive. Mr. Newton was, of course, somewhat severe on the modern villa type of house, but he (the Chairman) thought they might hope for improvement, of which signs were not altogether wanting. He agreed with what was said as to the futility of striving after picturesqueness; such efforts generally came to grief. There was too often apparent a sense of fussiness and over-elaboration in modern houses. What was really wanted in a home-like house was reticence. Within certain limits of reservation, the fewer the features put into a design the better. Occasionally an ingle-nook or bow-window would come of itself,—it would arise naturally out of the plan; then it was all very well. But after all the care of the architect had been exerted, the effect of his work might be spoilt by the furniture put into the rooms by the client. For that reason the architect should endeavour to retain the ear of his client in the matter of furnishing.

The vote of thanks was then put, and carried with loud applause.

Having passed votes of thanks to the President and other officers, as recorded in another column, the meeting terminated.



Old Houses at Vauxhall.

OLD HOUSES AT VAUXHALL.

SOME picturesque old wooden houses at Vauxhall are being swept away in the course of improvements being carried out in that neighbourhood. The old wooden dwellings just demolished reminded one of the wooden "houses" of Essex, and certainly seemed out of character with a place which now boasts a large new railway station. But a few years ago Vauxhall had plenty of such "shanties" as those depicted here. The Thames Embankment and Doulton's factory swept many away, and many more have gone for the South-Western Railway extension. Few will regret the demolition of these old dwellings. Thomas Miller, "the basket-maker poet," long ago condemned them when, during the terrible cholera year, they were perfect plague-spots.

NEW DESIGNS FOR THE COINAGE.—In the House of Commons on Monday evening, the Chancellor of the Exchequer, replying to Mr. Causton, said the Departmental Committee on the new designs for the coinage would not present any report at present. It was proposed by the Committee that eight artists should be invited to send in designs for the sovereign, half-sovereign, crown, half-crown, florin, and shilling. The proposal was approved, and invitations had been issued to a certain number of artists on March 17. All designs were to be delivered to the Deputy Master of the Mint on or before October 31 next. In reply to a further question by Mr. Causton, the Chancellor of the Exchequer said the Committee, he understood, would recommend the withdrawal of the double florin.



HOE FARM, HASCOMBE, SURREY.

WE give this as an example of a simple but picturesque small country house, by an architect, (Mr. E. L. Lutyens) two of whose designs for a similar class of building are now exhibited at the Royal Academy.

COMPETITIONS.

PUBLIC BATHS AND LIBRARY, DEWSBURY.—The *Leeds Mercury* says that on the 25th inst. the Dewsbury Town Council, sitting at the Town Hall as the General Purposes Committee, opened the envelope marked No. 13, belonging to one of the competitive plans for the above building, and it was found to be from Mr. G. E. T. Lawrence, architect, of Queen Victoria-street, London. Various alterations, both in baths and library, were suggested, and a deputation was appointed to wait upon Mr. Lawrence. Two other plans had been thrown out of the competition, and a fourth was brought in and marked No. 2. This was found to be from Mr. John Lane Fox, of Dewsbury.

BRITISH INSTITUTION SCHOLARSHIPS, 1891.—We may remind competitors for these that all works in competition must be delivered at the entrance to the Western Galleries of the Science and Art Departments at the north end of Queen's Gate, South Kensington, on Wednesday, July 15, or Thursday, July 16, between the hours of 10 a.m. and 6 p.m. All requisite information can be obtained on application by letter (with stamped and directed envelope enclosed) addressed to the Trustees, British Institution Scholarship Fund, 19, York-buildings, Adelphi, W.C.

Illustrations.

THE NATIVITY: CENTRE OF A TRIPTYCH.

THIS is a reproduction from a pencil drawing at present hung in the Royal Academy, illustrating a painting executed by Mr. N. H. J. Westlake as the centre of a triptych at the church of St. Paul's, Wilton-place. It represents the adoration of the shepherds, with a choir of angels above.

CHURCH OF SS. PETER AND PAUL, CHARLTON, DOVER.

THE present church of SS. Peter and Paul, Charlton, is a mean little edifice, with three galleries, and was enlarged in 1827 in the style of that period. It was at this church that Dr. Pusey formed a spiritual refuge when under suspension at Oxford. The proposed new church is of the style of the early part of the thirteenth century, and will be seen to be lofty and impressive, while plain and simple in its treatment. The architect is Mr. James Brooks, Canterbury Diocesan Architect. The church will consist of nave, aisles, north and south transepts, chancel, north and south chapels; the latter chapel will have a second altar. A vestry is placed in the north-eastern angle of the site, and at the north-western angle a tower will be erected, having the appearance of being partly detached. The lower stage of this serves as an entrance-porch, and it is in contemplation to hang a peal of bells in the upper part. A flèche to receive the sanctus bell will be constructed at the intersection of roofs. The exterior of the building will be faced with Kentish Rag, and have Ancaster stone dressings. The entire internal surface of the walls is to have a facing of Bath stone. The roofs will be covered with green slates, having on the inside barrel-shaped ceilings throughout formed of boarding, and with ribs on the underside to divide the space into panels.

The perspective drawing is at present hung in the Royal Academy Exhibition. We give also a sheet of geometrical drawings of the building which Mr. Brooks has been good enough to furnish.

PULPIT, ENGLISH CHURCH, ROME.

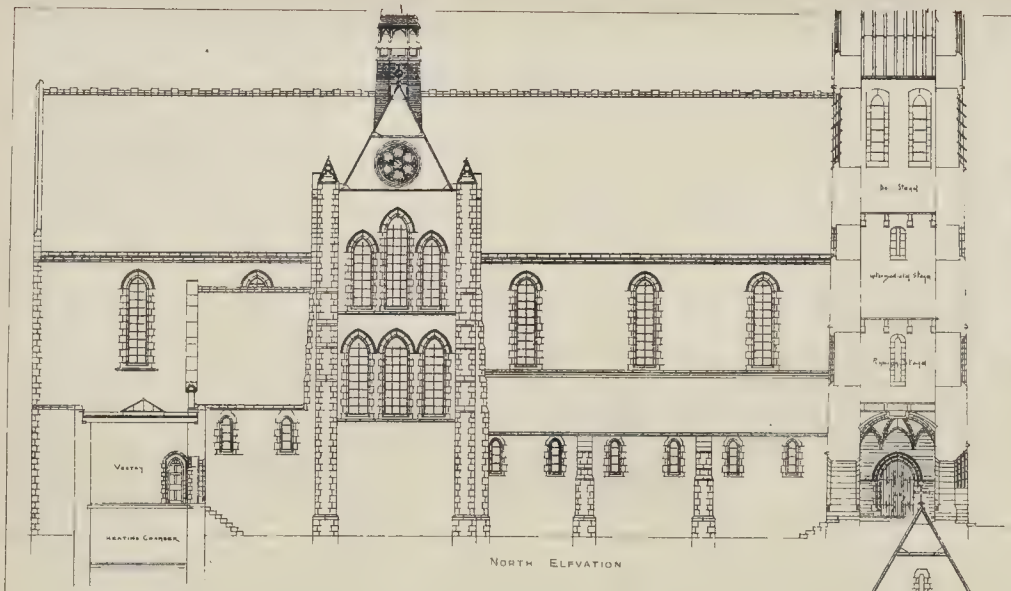
THE pulpit here illustrated is designed by Mr. Arthur E. Street for the English Church at Rome. The main structure is of Siena marble, with Perugia marble for the handrail, strings, and shafts, and verd-antique for the panels.

The drawing of the pulpit is in the Royal Academy exhibition.

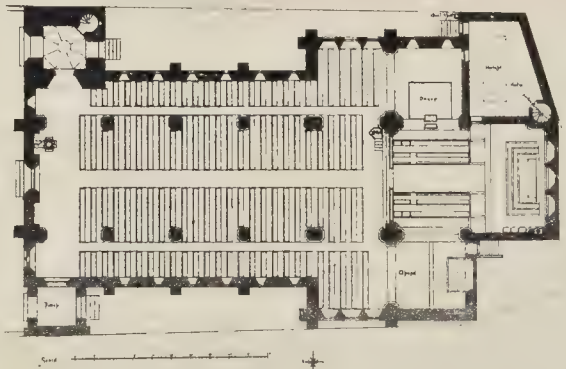
FONT, ST. MICHAEL'S, SMETHWICK.

THIS simple but original design for a font has been made by Mr. Arthur E. Street for the church of St. Michael at Smethwick, an outskirt of Birmingham. The font is of yellow Mansfield stone, with blue Warwick stone for the steps. The font-cover is of deal stained green and picked out with red, yellow, and white. The little terminals are of brass.

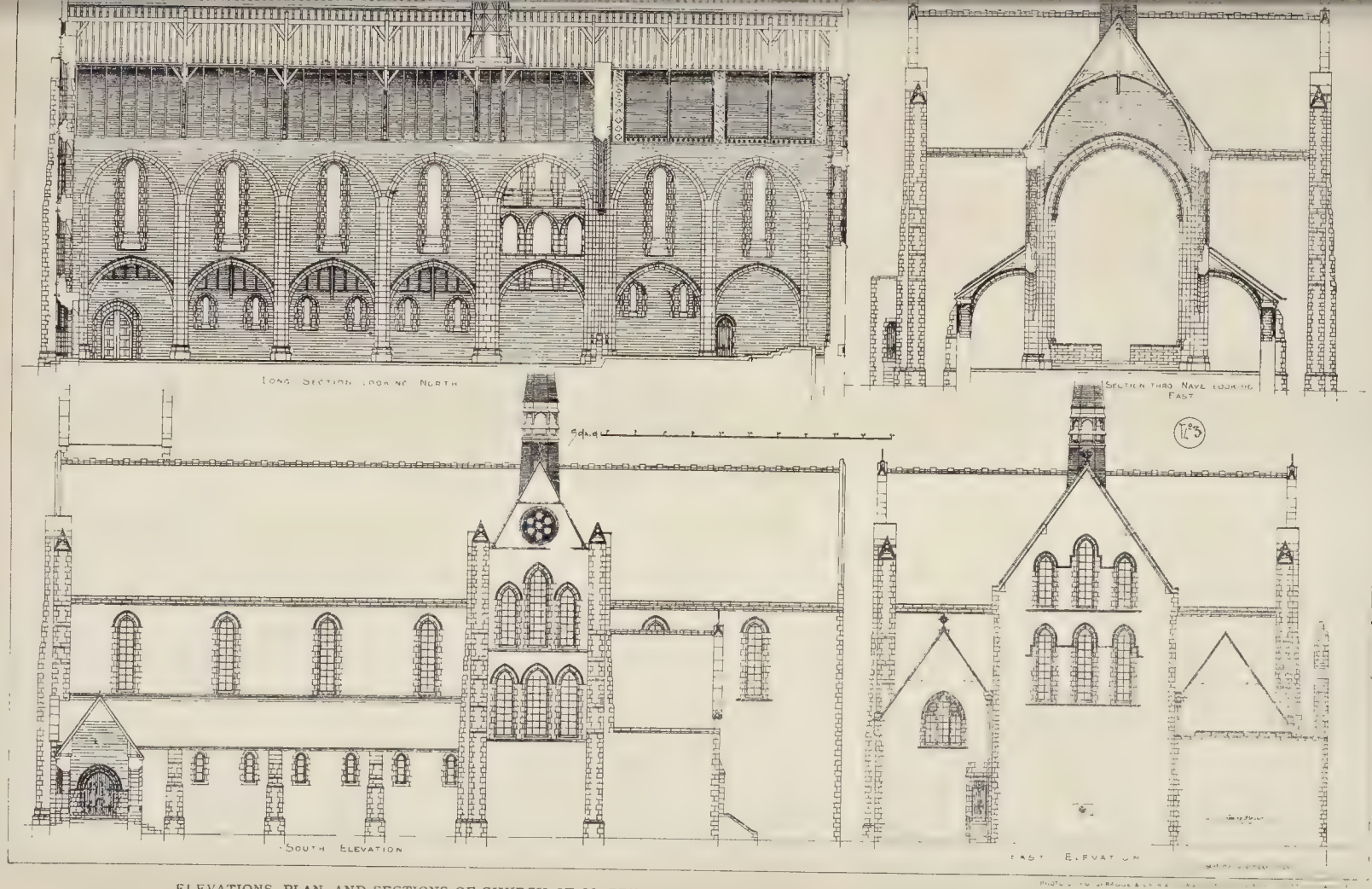
The drawing is hung in the Architectural-room at the Royal Academy, where there is also a drawing of the church (of which Mr. Street is the architect) for which the font was designed



North Elevation







ELEVATIONS, PLAN, AND SECTIONS OF CHURCH OF SS. PETER AND PAUL, CHARLTON, DOVER.—Mr. James Brooks, F.R.I.B.A., Architect



PULPIT, ENGLISH CHURCH, ROME.—Mr A. E. Street, M.A., Architect

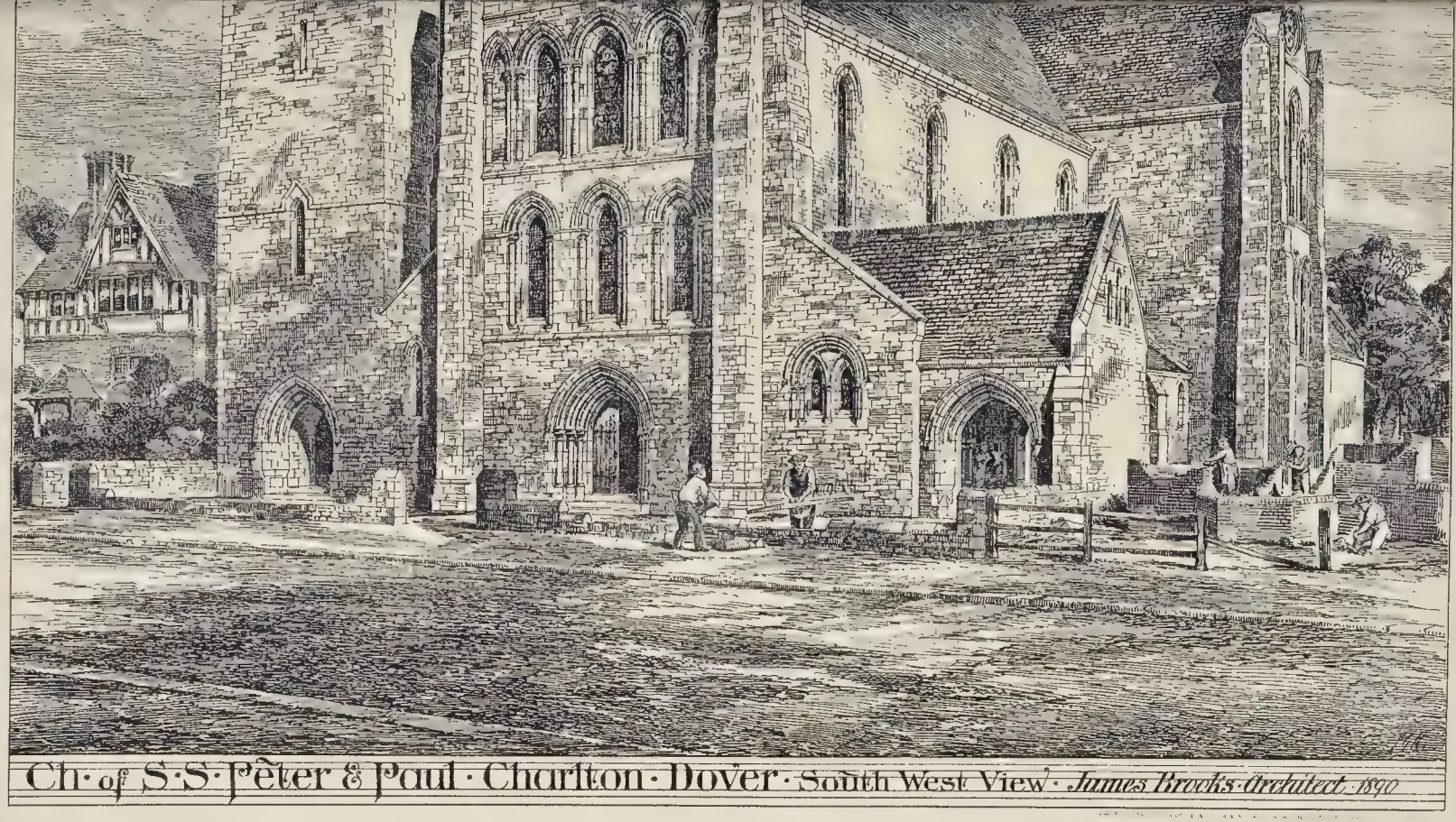
No. 1879 Royal Academy Exhibition, 1891



FONT, ST. MICHAEL'S, SMETHWICK.—Mr A E Street, M.A., Architect

. 1880, *Royal Academy Exhibition, 1891*





Ch· of S·S· Peter & Paul · Charlton · Dover · South West View · *James Brooks· Architect. 1890*

No. 1779, Royal Academy Exhibition, 1891

THE ARCHITECTURAL ASSOCIATION.

THE last meeting of this Association for Session 1890-91 was held on Friday, the 22nd inst., in the Meeting-room of the Institute of Architects, 9, Conduit-street, Mr. Leonard Stokes, President, in the chair.

Mr. H. G. Potter was elected a member of the Association, and three nominations for membership were read.

Mr. E. S. Gale, Hon. Secretary, said he had much pleasure in proposing cordial votes of thanks to Mr. Alfred Waterhouse, R.A., and to Mr. T. E. Collcutt, for kindly permitting visits to the new Weigh-house Chapel and the Imperial Institute respectively.

Donations.

The President said he was sure that the members would be extremely delighted to hear that the Association's list of donations in aid of the extension of their educational work had been headed by Mr. Alfred Waterhouse, who had presented them with the sum of 100 guineas. Mr. Aston Webb had also promised them fifty guineas. It would be remembered, also, that Mr. H. L. Florence had promised them 100 guineas conditionally, and that Mr. Seth Smith had promised them 50*l.* a year for three years. Mr. Edmund Woodthorpe had also recently given them a very large number of volumes of the *Builder* and other journals.

These announcements were received with loud and long-continued applause, and a vote of thanks to the donors was carried by acclamation.

A New Monogram.

The President said that on the cover of their Brown-book, on invitation-cards, and on some of their stationery, they had been in the habit of printing for many years past a little badge or monogram, consisting of the letters "A.A." surrounded by the motto of the Association, "Design with Beauty, Build in Truth." On his own account he had ventured to commission Mr. Walter Crane to design a new monogram for them, which he was happy to offer for their acceptance, unless they had any reluctance to the abandonment of the old design.

Proofs of the new monogram (of which we here append an illustration) having been sent



round for inspection by the members, it was resolved, on the motion of Mr. Beresford Pite, to accept the President's generous gift with hearty thanks.

Election of Officers and Committee.

Mr. F. R. Farrow, the senior hon. sec., then read the report of the scrutineers of the balloting papers for the election of officers for next session (1891-92). The report stated that 266 papers had been sent in, of which eight were informal. The following were elected:—

President: Mr. F. T. Baggallay, F.R.I.B.A.

Vice-Presidents: Messrs. F. R. Farrow, F.R.I.B.A., and E. W. Mountford, F.R.I.B.A.

Committee: Messrs. Leonard Stokes, F.R.I.B.A., T. E. Pryce, A.R.I.B.A., H. O. Cresswell, A.R.I.B.A., W. Burrell, O. Fleming, A.R.I.B.A., A. Beresford Pite, F.R.I.B.A., Paul Waterhouse, A.R.I.B.A., A. W. Earle, C. H. Brodie, A.R.I.B.A., and E. Woodthorpe, A.R.I.B.A.

Treasurer: Mr. H. W. Pratt, F.R.I.B.A.

Librarian: Mr. J. W. Stonhold, A.R.I.B.A.

Assistant Librarian: Mr. C. H. Freeman.

Hon. Secs.: Messrs. E. S. Gale and F. T. W. Goldsmith, A.R.I.B.A.

Hon. Auditors: Messrs. W. C. Jones and E. C. Pinks.

Mr. Earle asked whether the secretaries could not announce the numbers of votes recorded for each candidate for the Committee?

The Chairman said he thought it was preferable not to announce the numbers. The names had been read in the order in which they stood on the scrutineers' report.

Mr. F. T. Baggallay, in moving a vote of thanks to the scrutineers (Messrs. Webb, R. G. Booth, Gamble, and Parkes), said he wished to take the opportunity of tendering his hearty thanks, personally and on behalf of his colleagues, for his and their election. All he could say was that they would endeavour to deserve the confidence which had been reposed in them.

The A. A. Travelling Studentship.

Mr. Farrow announced the receipt of a report from the Prizes Sub-committee, in accordance with which they recommended the award of the A. A. Travelling Studentship this year to Mr. Kotaro Sakurai. (This announcement was received with loud applause. The recipient is a native of Japan, and has been for some years a member of the Association).

Votes of thanks were accorded to the members of the A. A. Lyric Club, and other gentlemen who helped to make the recent *soirée* of the Association a success.

Mr. F. R. Farrow, in the unavoidable absence of the author, read a paper by Mr. Ernest Newton on "Home-like Houses," which, together with some notes of the discussion which followed, will be found on another page.

Votes of Thanks to Retiring Officers.

Mr. Beresford Pite said that before the Chairman announced the adjournment of the meeting he wished to propose a hearty vote of thanks to him for the able manner in which he had discharged the duties of President for the past two sessions. It was largely owing to the tact and good temper of their President during the discussion of the scheme for the reconstitution of the Association that they found themselves in their present happy circumstances. He had had a somewhat troublesome crew to manage, but he had succeeded in safely piloting the ship between Scylla and Charybdis. Another point on which he though they must congratulate themselves was that in having Mr. Stokes as their President they had had at their head a practising architect whose talents and abilities were known and appreciated by the whole profession. The Presidentship of that Association was an honour to be coveted, and while they must all feel that that honour had been properly bestowed upon Mr. Stokes in the first instance, they none of them regretted that his term of office had been extended.

The motion was received with loud and long-continued applause, and carried by acclamation.

Mr. Stokes, in the course of a brief reply, said that it had been a great pleasure to him to do what he could for the Association, and he trusted that his interest in it would not cease with his retirement from the chair. It was true that the duties of the office had involved a good deal of trouble, but by way of compensation he had experienced the pleasure of feeling that his efforts on their behalf had been appreciated. Although he was glad that his two years of office were behind him, he should always look back upon them as two of the happiest years of his life.

Mr. A. W. Earle next proposed a vote of thanks to Mr. F. R. Farrow, the retiring honorary secretary.

The Chairman said he should like to second that. Mr. Farrow had held office for the past four years, and it was very difficult for those who were not members of the Committee to realise what that meant. Mr. Farrow had been constantly at the beck and call of the Association, and had been unwearied in his efforts for its prosperity and the extension of its usefulness. In short, he had carried out the duties of his office in a manner which was beyond all praise.

The motion was carried with loud applause.

Mr. Farrow briefly expressed his acknowledgments.

On the motion of Mr. T. E. Pryce, a hearty vote of thanks was accorded to the Treasurer, Mr. Hampden W. Pratt; and, on the motion of Mr. W. J. H. Leverton, a similar expression of thanks was accorded to the Librarian, Mr. W. H. Town.

The meeting then terminated.

CIVIL LIST PENSIONS.—The Civil List pension list closes on June 30. Among the latest additions to the list is Mrs. Redfern, the widow of a sculptor well-known to many of our older readers, James F. Redfern. He died at Hampstead in 1876, and his widow now receives a pension of 100*l.* per annum.

THE SURVEYORS' INSTITUTION:

ANNUAL REPORT.

THE twenty-third annual report of the Council of this Institution, submitted to the annual general meeting on Monday evening last, contained the following passages:—

"The Council have the pleasure of submitting to the members the usual report on the state and progress of the Institution during the twelvemonth which closes to-day. Judged by any standard, the year has been marked by abundant evidences of prosperity. The increase in numbers, as will be seen by the subjoined table, has been greater than in any previous year, a fact due, to some extent, to the approaching change in the system of admission; but also, in a considerable degree, to the growing influence of the Institution, and the repute it enjoys as a Professional Society devoted to practical objects.

Increase of Membership.

	Honorary Members.	Fellows.	Professional Associates.	Associates.	Students.	Total.
May 1891	14	1,360	336	96	140	1,946
May 1890	15	1,080	310	89	123	1,617
	−1	+280	+26	+7	−17	+329

The increase of 280 in the number of Fellows is accounted for by 259 elections and forty-three transfers from the class of Professional Associates, less seventeen deaths and five cessers of Membership.

The relatively small increase in the number of Professional Associates is due to the fact that during the year forty-three members were transferred to the class of Fellows, while two died and fourteen ceased to be members.

The number of Associates remains, as a rule, much the same from year to year; the increase of seven, notwithstanding two deaths and two cessers of membership, is larger than in any recent twelve months.

The net addition to the number of Students has been seventeen.

It will be observed that there has been a large increase in the number of country Members during the year.

The effect has been a satisfactory expansion of the Membership in several parts of England at a distance from the Metropolis in which the Institution has hitherto been rather scantily represented.

The loss of members by death has unhappily been greater than in some previous years. By the decease of the Duke of Bedford the Institution has lost an Honorary Member who was a most munificent donor to the Library.

The annual growth of the Membership from the foundation of the Institution is shown in the following table:—

Yearly Growth of Membership.

Year.	Members (or Fellows) after 1881.	Associates. Professional.	Associates. Ordinary.	Students.	Total.
May, 1869	102	38		2	202
,, 1870	180	59		2	241
,, 1871	192	65		2	259
,, 1872	265	67		4	276
,, 1873	225	74		5	304
,, 1874	247	89		6	332
,, 1875	276	101		11	387
,, 1876	300	119		8	427
,, 1877	319	133		11	454
,, 1878	312	134		5	454
,, 1879	330	146		10	486
,, 1880	342	155		10	507
,, *1881	357	164		14	535
,, 1882	480	235		7	722
,, 1883	557	218	74	38	887
,, †1884	666	307	80	58	1,121
,, 1885	703	317	86	86	1,192
,, 1886	710	316	84	80	1,196
,, 1887	741	339	89	108	1,277
,, 1888	793	333	90	102	1,323
,, 1889	910	334	89	110	1,443
,, 1890	1,095	310	89	123	1,617
,, 1891	1,374	336	96	140	1,946

* After August, 1881, 'Members' were designated 'Fellows,' and, in 1883, 'Associates' were divided into 'Professional Associates,' and 'Non-Professional Associates.'

† The Compulsory Examination for Professional Associates came into operation in 1884.

Examinations.

The number of Candidates for the Preliminary Examinations, as will be seen from the

subjoined table, shows a large increase over the number of any previous year:—

Years.	Preliminary Examinations.			Professional Examinations.		
	Candidates.	Passed.	Percentage.	Candidates.	Passed.	Percentage.
1881	13	6	46·15	2	1	50·00
1882	30	17	56·66	—	—	—
1883	44	22	50·00	25	22	88·00
1884	51	30	58·82	36	23	63·89
1885	46	37	80·43	43	31	72·09
1886	46	34	73·26	56	38	67·85
1887	53	39	73·58	58	45	77·59
1888	48	39	81·25	73	52	71·23
1889	51	41	80·39	71	51	71·83
1890	53	44	83·01	96	70	72·91
1891	76	60	78·94	92	68	73·91
Totals ..	511	369	72·21	553	401	72·51

Of the total number (ninety-two) of Candidates for the Professional Examinations, fifty-five were from the Provinces, thirty-seven from London. . . .

The first of the Special-Certificate examinations in Forestry and in Sanitary Science were held on June 17, 18, and 19, 1890. Six Candidates presented themselves in the subject of Forestry, of whom two passed, and five in Sanitary Science, of whom only one satisfied the Examiners. It was not expected that any large number of Candidates would at first submit themselves to an ordeal which is more a test of practical experience than of theoretical knowledge, and several years will elapse before much progress as regards these Examinations can be looked for. The Council do not, therefore, propose to hold another Special-Certificate Examination until 1892, if a sufficient number of Candidates have then accumulated to justify them in putting the rather expensive machinery again in motion. . . .

It only remains to remind the Members that in the course of less than three months from the present date the Institution enters upon a new epoch of its existence.

During the few weeks that remain it is hoped that any qualified Surveyors (especially the partners of present Members) will avail themselves of this last opportunity of joining the Institution under the expiring practice qualification.

The Council also appeal to Members to urge upon their pupils and professional assistants the importance of qualifying by examination for Membership, thus laying a broad and strong foundation for the development of the Institution in future years."

The report was adopted.

The annual dinner of the Institution was held on Monday evening at the Holborn Restaurant, the President, Mr. Robert Collier Driver, taking the chair. The company included Lord Basing, Sir Robert Rawlinson, K.C.B., Mr. P. E. Cunliffe (President of the Incorporated Law Society), Sir Henry E. Cartwright, Mr. E. Leader Williams, C.E., Colonel Bristow, Mr. E. Ryde (past President), Mr. E. P. Squarey (past President), Mr. D. Watney (past President), Mr. T. Chatfeild Clarke (vice-President), Mr. J. Martin, Mr. R. Vigers, Mr. J. Shaw, Mr. A. Back, Mr. E. Smyth, Mr. Wheeler, Q.C., Lieutenant-Colonel G. A. Leach, R.E., Mr. A. M. Dunlop, Mr. T. M. Rickman, Mr. A. Vernon, Mr. H. T. Steward, Mr. G. M. Freeman, Mr. H. T. Ashby (President of the Institute of Builders), Mr. S. Chadwick, Mr. Humphreys (Leicester), Professor H. Robinson, Mr. Wright (Nottingham), Mr. C. N. Driver, Mr. W. B. Stenning, Mr. H. H. Collins, Mr. W. Woodward, and Mr. J. W. Penfold (hon. secretary).

Improvements to Esplanade, Brighton.—Mr. Thomas Codrington, M.I.C.E., Local Government Board Inspector, held an inquiry at the Brighton Town-hall, on the 21st inst., in reference to an application by the Town Council for sanction to borrow 5,000*l.* for improving the Western Esplanade. The Town Clerk explained that it was proposed to face the Gaps at Middle-street and Ship-street with red brick so as to make them in keeping with the rest of the structure, and at the former Gap to build three new arches, to widen the Esplanade opposite the Grand Hotel, construct ten new arches, reconstruct the urinal, and make new steps to the beach, and further to raise the Esplanade on the seaside westward of the West Pier so as to make the surface more level, and to construct a number of new arches there. There was no opposition to the scheme.

THE INSTITUTION OF CIVIL ENGINEERS:

ANNUAL MEETING.

The annual general meeting of corporate members "to receive and deliberate upon the report of the Council on the state of the Institution, with the annual statement of the accounts, and to elect the Council and officers for the ensuing year," took place on Tuesday last, Sir John Coode, K.C.M.G., the President, being in the chair.

In the Report of the Council for the Session 1890-91, it was remarked that the salient feature of the Session, now terminated, had been the realisation of a proposal made more than forty years ago, namely: the formal reception by the President and Council on stated evenings after the ordinary meetings of the members and visitors then present. This was proposed, in 1850, by Sir William Cubitt, but for various reasons the suggestion was not acted upon, although in a modified form it was met by the *Conversazione* given by the President. In progress of time the gradually increasing numbers forming the Institution rendered the continuance of this social gathering impracticable. Sir William Cubitt's idea was—first, the provision, at intervals during the Session, of an opportunity for the personal introduction to the President and Council of those members who might not otherwise make their acquaintance; and, secondly, the collection in the rooms of the Institution of a limited number of models and specimens. A series of receptions was held after the ordinary meetings in the months of January, February, March, April, and May of this year. An endeavour had also been made to identify, in some degree, each gathering with a particular branch of engineering, both in respect to those invited to be present and to the models and other objects of interest exhibited. These receptions were believed to have been most successful, and experience would doubtless suggest directions in which they might be rendered still more useful and attractive in the future.

Passing to the usual business of the session, it was noted that twenty-three ordinary meetings were held at which eleven papers had been read and discussed. For some of these papers Telford Medals and Telford Premiums had been awarded to Messrs. Ll. B. and C. W. Atkinson, and to Mr. R. E. B. Crompton, and Telford Premiums to Messrs. F. E. Robertson, E. W. Stoney, Professor John Milne and Mr. J. McDonald, Mr. W. Langdon and Mr. W. T. H. Carrington. For other papers, printed or to be printed in the Proceedings without being discussed, Telford Premiums had been awarded to Messrs. B. Donkin, Jun., J. J. Webster, and C. P. Sheibner. There were eight Supplemental Meetings for Students, at which, unfortunately, the attendances had been small. For papers read at these meetings Miller Prizes had been awarded to Messrs. E. L. Hill, J. H. Barker, W. A. P. Tait, B. Chatterton, J. W. Brown, A. Sealy-Allin, and W. H. Wheeler. The first three of these papers had been deemed worthy of publication, and would appear, either in whole or in part, in the Minutes of Proceedings. The works visited by the students were referred to as having been greatly appreciated by those who had availed themselves of the privileges offered, and the Council recorded its sense of indebtedness to the heads of the several establishments.

The effective increase in the roll of the Institution during the past year was 247. There had been elected 2 Honorary Members, 51 Members, 291 Associate Members, and 7 Associates, and 3 Associate Members had been restored to the Register. Only 107 names had disappeared from the list. The number of members of all classes, students excepted, on March 31 last was 5,150, as against 4,903 on the same day last year, representing an increase at the rate of 5 per cent. The Student class had somewhat diminished in numbers, the total being, on March 31 last, at 914, as against 969 on March 31, 1890. This was not due to any diminution in the numbers admitted, but to the fact that more students had been elected Associate Members during the year, and that a greater number had become ineligible to remain in the class by reason of having passed the limit of age, namely, twenty-six years. Adding the students to the number on the register, the gross total on the books was 6,064.

From the balance-sheet appended to the report it appeared that the receipts during the financial year amounted to 24,274*l.* 8s. 11d., and the payments to 23,351*l.* 1s. 9d. The capital invested during the year represented the purchase of Railway Debenture Stocks of the nominal (or par) value of 6,500*l.*, thus bringing up the Institution investments to 50,000*l.*, besides which the Corporation was possessed of freeholds which had cost 40,000*l.*, the Whitworth Legacy of 5,400*l.*, and Trust Fund Investments aggregating 15,286*l.*

The Council congratulated the members that, as the result of protracted litigation with the Inland Revenue Department, the House of Lords had upheld the judgment of the Court of Appeal, that the whole of the property of the Institution was exempt from Corporation duty under the Customs and Inland Revenue Act of 1885, on the ground that it was legally appropriated and applied for the promotion of education and science.

In conclusion, reference was made to the action of a committee of members outside the Council, which had resulted in the establishment of an endowment fund for the purpose of perpetuating the memory of the long services of the secretary in the interests of the Institution. It had been decided that the endowment in question, with any future additions, should be applied to the establishment of a "James Forrest Lectureship," it being left with the governing body for the time being to determine the subjects, the periods of recurrence, and all other details connected with such Lectureship.

The adoption of the report was moved, seconded, and carried, and it was ordered to be printed in the Minutes of Proceedings. Cordial votes of thanks were then passed to the President, to the Vice-Presidents, and other members of the Council, to the auditors, to the secretaries and staff, and to the scrutineers.

The ballot for Council resulted in the election of Mr. George Berkley as President; of Mr. H. Hayter, Mr. A. Giles, M.P., Sir Robert Rawlinson, K.C.B., and Sir Benjamin Baker, K.C.M.G., as Vice-Presidents; and of Mr. W. Anderson, D.C.L., Mr. J. Wolfe Barry, Mr. E. A. Cowper, Sir Jas. N. Douglass, F.R.S., Sir Douglas Fox, Mr. J. Clarke Hawkshaw, M.A., Mr. Charles Hawksley, Sir Bradford Leslie, K.C.I.E., Mr. George Fosbery Lyster, Mr. J. Mansergh, Sir Guilford Molesworth, K.C.I.E., Mr. W. H. Preece, F.R.S., Sir E. J. Reed, K.C.B., F.R.S., M.P., Mr. W. Shelford, and Mr. F. W. Webb as other members of the Council.

The session was then adjourned until the second Tuesday in November, at 8 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION

At the meeting of this Association on the 20th inst., Mr. J. W. Grover, F.S.A., in the chair, it was announced that the Marquis of Ripon had accepted office as President of the Association at the Annual Congress, which will be held at York, to begin on August 17 next. Visits will be paid to Rieuvaulx and Bylands Abbey, various ancient castles, and, by invitation of the President, to the ruins of Fountains Abbey. Mr. Allis sent communications with respect to the remarkable Roman remains which have recently been found at Lincoln. A long colonnade of large Roman pillars has existed in the centre of ancient Lindum. The bases of these pillars have been found *in situ*, ranged in a straight line with those which exist beneath Mr. Allis's house, discovered and preserved by him a few years ago, and where the angle of the colonnade is marked by double columns curiously joined together. Three other examples of these double bases have now been found, showing a break in the continuity of the plan, and at this place a Roman milestone, probably marking the centre of the ancient city, was found some years since. The entire length of the colonnade is about 280 ft. Mr. Marriage exhibited several fine examples of Venetian glass, and Mr. Macmichael described some interesting examples of Roman pottery found in the city. A paper by Mr. A. G. Langdon on the Padstow crosses, Cornwall, was then read. These crosses are three in number, one being in the churchyard, another at Prideaux-place, and a third, a cross head only, in the garden of a cottage occupying the site of the old vicarage. The latter is of Elvan stone, and the two first of granite. They are curious for having cusps in the heads of two of the examples, while other portions are covered with early patterns of plait work.

IRON AND HARDWARE TRADES' PENSION SOCIETY.

THE forty-eighth anniversary festival of this charity was held at the Ironmongers' Hall on Tuesday evening last, Mr. Howard J. Kennard in the chair, and the Master Cutler of Sheffield, Mr. Robert Colver, in the vice-chair. The charity pays out to pensioners something like 3,000*l.* a year, and has now about 130 recipients of its bounty. Mr. Kennard has signalised his year of office by unusual exertions towards raising the income of the society, and he has so far succeeded that there has never been a year in the experience of the society when so much has been collected—the sum of 4,269*l.* 11s. 3d. was announced by the secretary as subscriptions and donations.

Mr. Kennard said he aspired to the institution being made a royal society, but before that could occur he must be able to show a larger annual revenue. In two years' time the society would attain its jubilee, and he hoped to have the Prince of Wales in the chair on that occasion.

Mr. Windson Richards devoted much of his speech to a vindication and advocacy of trade combinations. As the workmen were quick to combine to strike up their wages on a rise in iron prices, so he maintained that employers might legitimately combine so as to abolish the ruinous, foolish, and reckless competition that prevailed among them. In this case he was sure that the interests of the general trade of the country would not suffer.

Since the foundation of the society there have been received 75,586*l.* in subscriptions, and 27,655*l.* in donations; of which sum 90,933*l.* have been paid as pensions. The entire expense of working the concern is stated to be under 7½ per cent., or for the forty-nine years of its existence, 18,676*l.*

THE MINING INDUSTRIES OF THE WORLD.

THE *Economiste Francais* in a recent issue contains an interesting article on the mining industries of the world, of which we give a *résumé*. Dealing first with the coal industry, we learn that the world's production of coal in 1888 reached the enormous total of 466,406,000 tons, valued at 136,500,000*l.* The greatest output is shown by this country, which in 1888 produced 169,935,000 tons, and the smallest by Russia, viz., 4,580,000 tons. Austria-Hungary comes fourth with 23,647,000 tons, and France only fifth with 22,603,000 tons. Great Britain finds employment for the largest number of colliery hands, viz., 535,000, and Russia for the smallest, 33,000, and although Austria produces a million tons of coal more than France the number of hands employed in the industry is much smaller in the former country, viz., 97,000 to 105,000. The cost of raising and dressing the material is dearest in France, viz., 10·31 francs per ton, and cheapest in Austria, viz., 5·23 francs. As regards other mining industries, iron, gold, silver, &c., the subjoined table gives the production of the world in 1888:—

	Ore. Tons.		Value. Francs.
Iron	23,512,000	...	1,624,374,000
Gold (166,225 kilos)	—	...	549,500,500
Silver (3,720,951 kilos)	—	...	764,800,000
Copper	341,000	...	541,664,000
Lead	517,000	...	199,359,000
Zinc	344,000	...	151,644,000
Tin	35,000	...	98,626,000
Quicksilver	4,000	...	22,103,000
Nickel, cobalt, and platinum	3,000	...	15,176,000
Total	24,760,000	...	3,967,746,000

The following was the output and value of other produce obtained by mining:—

	Tons.		Francs.
Coal	466,406,000	...	3,412,000,000
Petroleum	5,712,000	...	204,643,000
Bituminous fuel and asphalte	2,499,000	...	20,430,000
Rock salt	8,347,000	...	125,356,000
Manganese, pyrites of sulphur, sulphur, and graphite	1,215,000	...	50,022,000
Total	508,939,000	...	7,780,197,000

To which may be added:—

	Francs.
Precious stones	300,000,000
Clay, &c.	800,000,000
Total	8,880,197,000

Turning to the production and consumption of coal in France, the former amounted in 1779 to 250,000 tons, and the latter to the same, whereas 100 years later the figures were respectively 22,603,000 and 32,600,000 tons. To make good the deficit 5,100,000 tons had to be imported from Belgium, 4,100,000 tons from England, and 1,300,000 tons from Germany. Referring to the profit attending various mining enterprises, we are told that in France, in 1888, 226 of these paid, whilst 201 left a loss. Finally accidents in mines are dealt with, the figures furnished tending to show that through the measures of safety in mines, which are becoming more and more developed, their number is steadily decreasing. In proof of this assertion, English mines are taken, where, in the period 1851-60, the average number of accidents was 507 a year; in 1871-80, 233; and in 1881-8 only 199.

Books.

Encyclopédie de l'Architecture et de Construction. Directeur P. PLANAT. Vol. V.: Premier Fasciule. Paris: Dujardin & Cie.

M. PLANAT'S dictionary, which has now reached the letter L, includes in the new volume several important articles. A long and largely illustrated essay on "Gothique Anglaise" is contributed by the editor, and is written with a knowledge of and sympathy with English Gothic architecture unfortunately rare among French writers. He remarks in the early part of the article on the gradual manner of the extinction of Gothic in England, its gradual absorption into the new style, and that English architecture never shows those violent reactions against the past which have often been observed in the writer's own country; "les traditions s'y alterent, se modifient, il le faut bien; elles se brisent rarement." This would hardly apply, perhaps, to England in the nineteenth century, however true it may be about former times. The object of the article is to mark the principal epochs of English Gothic by examples characteristic of each period. As a *point de depart* M. Planat takes the front of Castle Rising Church, of which he observes that "toute simple qu'elle soit, celle façade donne ailleurs, comme tous les bons exemples de l'époque, l'impression d'une harmonie robust, tranquille, exempt de toute exaggeration, que les plus beaux specimens de la période Gothique ne produisant pas toujours." Nevertheless, M. Planat is enthusiastic over Canterbury, the eastern portion of course more particularly, which he considers as one of the most typical edifices in England; and he recognises the architecture of the nave of Lincoln as the example of the most sober and correct Gothic. Salisbury, Peterborough, and Westminster are touched upon, not too well illustrated, but perhaps as well as can be expected in regard to the conditions of production of a dictionary. Ely, Exeter, and York also come in for ample notice, and there are some examples of domestic Gothic, from Magdalen College, the Deanery of Wells, and South Wraxall Manor House. The article on "Gothique Allemande" is by Messrs. Lambert and Stahl, an article of the same type, rather better illustrated. "Greek Architecture" is treated by M. Joigny, an article which does not of course profess to treat that vast subject in any complete manner, but is intended, the writer says, as a kind of preface to the study of Greek architecture, a discourse summing up the various aspects under which the subject may be regarded; the origin of this form of architecture, and the special central qualities which distinguish it. In regard to one point, the modulus of proportion of Greek buildings, we observe that M. Joigny declines the long-accepted use of the semi-diameter of the base as the module, and considers that if the diameter of the column were so used it must have been the mean diameter. This is an important suggestion, and one which would upset all the proportion indications of "Normands Parallels" and other respectable old works.

"Île de France" is an article of considerable interest, on that venerable site which is the eye or nucleus of ancient Paris; and the large subject of Italian architecture is treated in a long and amply illustrated article by the competent hand of Professor Alfredo Melani.

M. Lucas continues to treat of English architects in short articles written with great judgment and appreciation, the articles on Inigo Jones and the late Sir Horace Jones being signed by his name. Inigo Jones was so remarkable a man that he might perhaps be held to have merited a larger and fuller notice than the three columns accorded to him, but he is treated at greater length than some very eminent French architects. It is regrettable to find that Gwilt (not in the able hands of M. Lucas) is dismissed with a single line, as an eminent architect who made the best dictionary of architecture. It is a very great pity that M. Planat should be robbed by an incompetent contributor of doing justice to a man who produced such a remarkable work as Gwilt's Encyclopædia, and we surmise that if M. Planat were aware of the full value and scope of that work he would himself regret having been betrayed into leaving its author so entirely without due recognition. Gwilt deserved at least as large a place in such a dictionary as Fergusson: perhaps a larger.

It is a pity that more care cannot be exercised about getting the spelling of English names correct, a matter in which however French publications are almost proverbially deficient. We have come across "Rugdale" (for "Dugdale"), "Walsokin," "Blomefield," "Houden" (for "Howden" church), in the course of turning over the pages, and probably there are more. Considering that all these names must be copied in the first instance from English publications, it might surely be possible to copy them correctly.

Lessons in Applied Mechanics. By JAMES H. COTTERILL, F.R.S., and JOHN HENRY SLADE, R.N. (London: Macmillan & Co.) 1891.

THIS little book is really an abridged edition of Professor Cotterill's larger treatise on applied mechanics. It is, however, of a much more elementary nature, and more suited for junior students who are commencing to study the subject. The authors have divided the book into three parts. In the first part the "Principle of Work" is considered, and in the second and third parts the strength of materials and structures, and the more elementary principles of hydraulics and hydraulic-machines are treated. There is an excellent selection of examples attached to each chapter, and the whole forms a book we can recommend with confidence to those who are beginning an engineering course of study.

Memoir and Letters of Sidney Gilchrist Thomas, Inventor. By R. W. BURNIE. (Murray.)

THIS is a pleasantly-written little work, giving an account of the too-early-cut-off life of the indomitable inventor of the celebrated process for the dephosphorisation of iron, which bears his name. The greater portion of the book, though very interesting and well worth perusal, is of a non-technical character. A few extracts from the account of the process will, however, probably interest our readers.

It was in 1875 that Thomas began to see his way to a solution of the hitherto baffling question, "Why was phosphorus retained in the Bessemer converter?" The answer was found in the fact that, with the acid lining of the ordinary Bessemer converter the phosphoric acid naturally could not combine, there being a complete absence of chemical affinity. The next step naturally was the utilisation of various materials that would form "basic" linings, for which the phosphoric acid would naturally have affinity. The investigation was a tedious one before sufficiently durable compounds were hit upon. Durability was essential to cheapness, and therefore to commercial success, and a substance that would long survive the intense heat of the Bessemer process was by no means easy to find. Thomas finally decided that the required material must be either lime or its congeners—magnesia, magnesian limestone, &c. A twofold object was aimed at, the first being the elimination of the phosphorus, thus enabling marketable steel to be made from hitherto unserviceable qualities of pig-iron; and the second, though subsidiary, was the preservation, in the basic slag, of the phosphoric acid, so valuable to the agriculturist. With the aid of his cousin, Percy Gilchrist, and the subsequent encouragement of Mr. Edward Martin, the manager of the Blaenavon works, and later on (at what was probably the critical moment) of Mr. E. Winsor Richards, the manager of Bolckow, Vaughan & Co's huge works in Cleveland, the process was worked out to a practical issue. It would take up too much space to follow the progress of process to its ultimate triumph; suffice it to say, that before the untimely end of the inventor, he had the satisfaction of seeing the creation of his brain recognised and utilised by nearly every iron-producing nation, and not without profit to himself and those associated with him. The police-court clerk, who a year or two before had been refused election to the Chemical Society, notwithstanding his undoubted scientific attainments, solved a problem that had completely baffled the learned *quid-nunes* who blackballed him.

The character of the converter lining being the essence of the process, a short extract from

the paper which Mr. Thomas, in collaboration with Mr. Gilchrist, prepared in 1878 for the Autumn Meeting of the Iron and Steel Institute, will be deemed of interest.

"Our early experiments rendered it clear that ordinary non-silicious limes and limestones did not constitute by themselves a satisfactory lining material, nor were renewed trials, made after becoming acquainted with a patent dealing with their application, more satisfactory. Magnesia, the use of which as a furnace lining has been suggested by M. Caron and others, is at once very expensive, and when used by itself, very tender. After a very extended series of trials it was, however, found that by firing bricks made of an alumino-silicious limestone at a very intense white heat a hard and compact basic brick is formed. These bricks unfortunately labour under the defect of a liability to disintegration when exposed to the action of steam. By the use of certain aluminous magnesian limestones and equivalent combinations, and an otherwise similar mode of manufacture, this difficulty has been, after many failures, overcome."

In order to avoid waste of lining, basic materials, such as common well-burnt lime, were added to the contents of the converter, so as to secure a highly basic slag at an early stage of the blow. In 1883, shortly before the close of his useful career, Thomas was awarded by the Iron and Steel Institute the prized distinction of the Bessemer Medal, and in a letter of thanks, written to the President, he observes that while in 1877 "no successful experiment tending to show that phosphorous could be removed in the Bessemer or Siemen's process," was on record, yet "for the present month of September, 1883, the make of dephosphorised Bessemer and Siemen's steel is between 60,000 and 70,000 tons." A marvellous result, especially viewed in the light of the many difficulties that had to be overcome by the young enthusiast, who, after a day's labour in the sordid atmosphere of a London Police-court, devoted the hours that for the ordinary man would be those of recreation, to the solution of a difficult and complex metallurgical problem.

Correspondence.

To the Editor of THE BUILDER.

THE STRIKE IN THE BUILDING TRADE.

SIR,—Building artisans appear to think that the questions of increased cost and shortened hours of work concern only themselves and the master builders. But there is clearly another large party concerned, viz., the general public, who are the paymasters. The present demand would add 11 (or 12 per cent. to the cost of labour all round, and besides this the extra time which would be necessary for carrying out works would increase seriously the expense. Take a common instance—certain alterations and repairs have to be executed on a house which necessitates the premises being vacated, and it is a serious question for the owner of the house in how short a time he can return and re-occupy the premises. Under the short hours proposed, the work would occupy much longer time than at present, unless the unfortunate house owner is prepared to pay an increase of 50 per cent. (time and a-half) for expedition. I maintain, Sir, that 52 hours per week is not an undue strain on an able-bodied working man—in fine weather. In winter there must be many days when he cannot see to work so long, and sometimes, from frost and fogs, must, perforce, be idle altogether.

May 28, 1891. A RETIRED BUILDER.

DISCOVERY OF A MEDIÆVAL PAINTING.

SIR,—During the execution of some additions to the ancient parish church of St. Mary, Puncknoll, on the English Channel, near Abbotsbury, Dorset, an interesting discovery of mural decoration above the Norman chancel arch has been made. Upon removing the accumulated coats of whitewash, traces of a decorative design were brought into view.

On the northern side of the arch the outline of the lower portion of a vesica is apparent. Within it appear to be two figures, one standing at what seems to be the base of a cross, the other suspended upon the cross, and judging from the position of the feet, it probably is a representation of the crucifixion in profile. Outside the vesica are two figures, facing each other, occupying the position of supports to a coat-of-arms.

To the north is a fifth figure turning his back upon this group.

There are traces apparently of circular shields, spearheads, &c. This description refers to the lower part only, as the upper is still more indistinct. The whole is framed by a border of lines enclosing at regular intervals the heraldic rose of five foils. The pigments used appear to be Indian red, yellow, and green, laid upon a very thin skimming of plaster upon the original stonework. Later this design was whitened over and a black letter inscription placed upon the new ground thus obtained. Subsequently successive coats of white and yellow-wash have until now hidden the whole. A similar mode of obliterating an early decoration by placing over it a black letter inscription was noticed a few years ago at Goathurst, in the adjoining county of Somerset. There are also traces of colour over the centre of the arch, and on the south side of it, but these are less distinct than those on the north. The workmen, however, were stopped from attempting to uncover any more, in the hope that an arrangement would be made for dealing with the remains without further injuring them.

J. HOUGHTON SPENCER.

Taunton, May 23, 1891.

AN OLD ESTIMATE FOR LAYING WATER-MAINS.

SIR,—The enclosed is a copy of a letter I have had in my possession for very many years. It has often occurred to me that some of your readers may know more about Mr. Norwood and his business than I do, and something might be elicited thereon. Mr. Thomas Hogg was surveyor to the Grand Junction Canal Company, or surveyed the land for their Act of Parliament, and was also a well-known land-surveyor of the end of the last century, and early in this century. The copy is exact to the spelling, the capitals, and to the lines, the original being written on quarto paper. Perhaps you may deem it worthy of insertion in the *Builder*. WYATT PAPWORTH.

33, *Bloomsbury-street, W.C.*
May 26, 1890.

[COPY OF LETTER REFERRED TO ABOVE.]

"Sir,—I hope you will Not think Me
Troublesom——
I have Made Calculation of Expence of Conveying Water to the Town you Mentioned by Means of My pipes or Tubes ——

I Give preferance to Making the pipes in the Country ——

if you think it Likely to take place Now is the Time to Execute the Business to the Best Advantage.

if Agreeable to you I will Contract to find pipes, and Lay them Down.—Under your Direction, on the following Terms—which will Give you Little Trouble —

	£	s.	
Viz.—pipes of 4 Inch Boar	2	6	Pyd
5 Inch Boar	3	0	Pyd
6 Inch —	3	6	P.yd

if the Town is at any Terme in want of Water ——Subscribers will Come forward—there is No Doubt —

if agreeable will take an Interest Myself——

there are Several Near London in Hand there is No Undertakins pay Better the Royal Pallace of Hampten Court is Supplyed with Water—About the Distance you Mention by pipes of the Kind I propose—Laid Down by—Cardinal Wolsey—are as Good as when Laid Down—proove as Ecatious and far Moore Dureable than Wood——

a 5 Inch Boar pipe with 3 feet pen will Supply a Learge Town——

I am at Presant at Leasure to Attend to the Businiss,—will Call on Monday Eveng—for an Answer

Compliance will Greatly Oblige
Your Most Humble Servt
W. Norwood

Friday Eveng
5 May 1809.

Addressed Mr Hogg"

HORROCKS'S OBSERVATION OF THE TRANSIT OF VENUS.

SIR,—The instrument delineated in the painting is an artist's equatorial telescope of early nineteenth-century fashion. What Horrocks (or Horrox) calls his "mighty tube" consisted of a Galilean telescope which he made, and for which he bought a negative eye-piece for, as he says, 2s. 6d. This cast an inverted image of the sun upon a diagram, which he would have made larger had his room been bigger. The diagram (sketch enclosed) was a circle very nearly 6 in. in diameter, having its circumference divided into 360 deg., and its diameter into thirty equal parts, each such part being subdivided into four equal portions. The sun's disc exactly filled the diagram; he saw Venus within the circumference from 3.15 p.m. until the sun set at 3.59 p.m. Venus appeared as a perfectly circular and uniformly opaque spot between ¼ and ½ in. in diameter, travelling her own diameter in about twenty-five minutes. He estimated the sun's diameter to that of Venus as 30′ to more than 1′12″ and less than 1′30″. The room was quite darkened; having previously adjusted his telescope to a focus, he rested one end either upon or close to an aperture in one of the shutters, receiving the sun's rays perpendicularly upon the diagram. We do not know what was the negative focus of the lens, or whether the room was constructed so as to afford a view of the sun throughout the day. The date, Sunday, November 24, 1639, which he gives for the transit is that of the Julian Calendar. Mr. Eyre Crowe's interesting, but in some respects inaccurate, picture forms the subject of an article which will, I believe, be printed in the June number of *Knowledge*. To the exertions of Mr. A. Cowper Ranyard, F.R.A.S., editor of that journal, the tablet (1874) in the Abbey is due. W. E. D.-M.

May 23, 1891.

COLOUR FOR SURFACE OF TENNIS COURT.

SIR,—In reply to your correspondent "J. T." (p. 415 *ante*), *re* above subject, I should paint the surface in fresco, that is before the cement is set, mix the dry colour with encaustic medium, and apply the same. He will find that the colour will penetrate into the cement, and retain its brilliancy.

HENRY H. B. SANG.

GRIMTHORPIAN.

SIR,—The Rev. J. C. Cox, F.S.A., Rector of Barton-le-Street, recently called the attention of the Chancellor of York to the sale of two old fonts which formerly stood in the parish churches of Scampston and Snainton in that diocese. He received a post-card from him in reply, stating that he (the Chancellor) had no more power or wish to prevent a man selling his old church fonts, than his Chinese geese or three tons of manure. Not a very dignified answer, you will say, from one who is supposed to look after church property.* However, it is satisfactory to know that they were bought by the Rev. E. A. Pitman, F.S.A., and placed in the churchyard, Malton Priory, until they can be restored to their proper use in churches. Both fonts are plain—one Saxon and the other Norman. Arrangements have already been made for replacing the one that was ejected from the old chapel at Snainton.

S. B. CHITTENDEN.

Stevenage, May 26, 1891.

DAMP COURSES AND BUILDING BY-LAWS.

SIR,—According to the old adage, those who look on see more of the game than those who play it, and, although in most cases this may be true, 'tis not so in all—to wit, the summons I took out against a builder for using a damp course of asphalte and string is not included. The by-laws prescribe a damp course of asphalte (not asphalte and hemp) impervious to moisture, but hemp is as sensitive to moisture as salt. A combination of hemp and asphalte may be impervious for a time, but my contention is that a damp course should be as imperishable as brickwork; if it is not, then it is useless. Hempen substances protected by asphalte and deposited in a dry place may last an indefinite time; but in a damp situation, and in contact with caustic material such as lime or cement, will assuredly decay; but as the by-laws are silent on the question of durability, I could not raise that point, so the decision was given against me with five guineas costs. That decision does not, however, prove the goodness of the material, but only the weakness of the law.

I tested this question five years back, having the assistance of counsel, solicitor, and experts, but Mr. Paget decided against me because the by-law does not prescribe the thickness of the asphalte. I reported the case very fully to the late Metropolitan Board of Works, who acknowledged the receipt of the report in very complimentary terms, and in this case I sought the opinion of the Superintending Architect, who referred my letter to the Building Act Committee, who replied recommending me to take the opinion of another magistrate. The summons was heard before Mr. Curtis-Bennett. I had counsel, lawyers, a chemist, and witnesses against me, who testified that the material was all that it should be, and instanced the case of an architect who could not make a pond watertight without it,—*i.e.*, the asphalte and string. There was some confusion as to the strata in which it was formed; whether the gravel was above the clay, or the clay above the gravel, I could not understand. Well, I made a pond for myself many years ago with cement concrete, and

* It is exactly the sort of reply which might have been expected from the quarter to which the inquiry was addressed.—ED.

it holds water still; then I believe tanks and sinks are made of Portland-cement, too; then I think a dock at Liverpool was made of it, and all answer very well without a mackintosh, but a mackintosh of asphalte and string did the needful in this case, and the architect sent a letter to the maker expressing his heartfelt gratitude for having been helped out of his hydraulic difficulty, as by the aid of a mackintosh of oxidised petroleum and string it had been watertight ever since, and much other convenient testimony which I could not disprove unless by adjournment.

Complaint is made of bad building, and of the District Surveyors for allowing it. The fault is not with the men but with the law, and the difficulties they experience in its administration; and the burden of my song is, give us sensible legislation and we will protect the public. That is the explanation of the summons in this case.

T. E. KNIGHTLEY.

106, *Cannon-street, E.C.*
May 27, 1891.

COUNTER-BALANCED SASHES.

SIR,—I notice by last week's journal that a Mr. Turner has obtained a Patent for hanging sashes by a system of counter-balancing. This idea I carried into effect twenty-five years ago, and have found it answer admirably. They are to be seen in Richmond at the present time.

DAVID LODER.

*** Our correspondent is not, we believe, the only person who has taken out a similar patent. The multiplication of patents for apparently the same thing, or with only infinitesimal differences, is in fact one of the mysteries of the whole subject of patents.—ED.

The Student's Column.

VENTILATION AND WARMING.—XXI.

DEPERDITION OF HEAT.

INASMUCH as the deperdition or loss of heat for which we have to allow in designing a system of ventilation and warming depends largely upon an application of the general principles which we have considered in our last chapter, an application that affects also the problem of practically transmitting heat, it will be convenient to investigate the deperdition of heat before dealing with the transmission.

Heated bodies lose their heat either by radiation or by conduction. By radiation to other bodies of a lower temperature, by conduction to the atmosphere, in connexion with their surfaces, and to the particles of their own or other bodies with which they are in contact.

We are speaking of the deperdition of heat from a practical point of view. It must, however, not be forgotten that there is no extinction of the heat. Energy or work, like matter, never becomes extinct. We may alter its form in a variety of ways, but we can never annihilate its existence. In speaking, therefore, of the deperdition of heat, we are regarding its loss as affecting the object we have in view. For example, in warming a room by an ordinary open fireplace, we say that a portion of the heat produced by the consumption of the fuel is lost up the chimney. By this we mean that the heat, which we should desire to warm the room and its occupants, is partially employed in warming the chimney, from which in most cases we derive no direct advantage. But the heat is not extinguished; it still remains in existence, though its location and its efficiency are not in the position where they are most useful to us, and, therefore, are, as we say, lost.

So the phenomena of radiation and conduction, though causes of the deperdition of heat, have a twofold aspect. Every heated body parts with a portion of its heat, both by radiation and conduction, as long as there remains any matter of lower temperature which can absorb that heat. But by this absorption the heat is not extinct; the absorbing matter continues to manifest the same phenomena of radiation and conduction as the original heated body, and if we can utilise this secondary action we avoid the deperdition of heat.

The activity of radiation from various surfaces varies with their nature, but not with their form, while the activity of conduction to contingent cold air varies with the form of the heated bodies, but not with their surface.

The absorption of heat follows the same laws with regard to different surfaces as those of radiation, hence a surface which radiates heat rapidly absorbs it rapidly, and *vice versâ*.

At ordinary atmospheric temperatures, and with small differences between the warm and cool surfaces, the transfer of heat by radiation is simply proportional to that difference, but with high temperatures and great differences of temperature, this law does not hold, and the absolute temperature of the absorbent has to be taken into account, which is done in the investigations of Dulong and Péclet, from which we obtain the following formula.

$W = 124{\cdot}72 \cdot S \cdot 1{\cdot}0077^{t} (1{\cdot}0077^{T-t} - 1)$ where W = the amount of radiated heat per square mètre in 1 hour, T = temperature of the heated surface, t = temperature of absorbent surface, both in degrees Centigrade, and S = coefficient of radiation for the particular surface, and is therefore the measure of the activity of different surfaces. The value of S for some of the most usual surfaces is as follows:—

Polished silver	S = 0·13
Polished brass	= 0·258
Copper	= 0·16
Zinc	= 0·24
Tin	0·215
Polished tinned iron	= 0·45
Sheet-lead	= 0·65
Ordinary iron plate	= 2·77
Rusted ditto	= 3·36
New cast-iron	= 3·17
Glass	= 2·91
Powdered chalk	= 3·32
Wood sawdust	= 3·53
Powdered coal	= 3·42
Fine sand	= 3·62
Oil paint	= 3·71
Paper	= 3·77
Building stone	= 3·60
Plaster	= 3·60
Wood	= 3·60
Brick	3·60
Woollen stuffs	= 3·68
Cotton	= 3·65
Silk stuffs	= 3·71
Lamp-black	= 4·01
Water	= 5·31
Oil	= 7·24

From this table we can select the particular material which will be most suitable for any special case, according as we desire radiation from or absorption by any particular surface or wish to avoid these phenomena.

The deperdition of heat by conduction to the contingent air-surface varies we have said with the form. This may be thus explained. The air which is first raised in temperature by contact, let us say, with the lower part of a wall, on reaching the second part of the wall has a less difference of temperature between it and the wall. It, therefore, abstracts a less amount of heat per square foot from the upper part of the wall, and continues to do so as the height of the wall increases and the difference of temperature between the wall and the air diminishes. Thus, it is at once evident that those surfaces lose most heat per square foot, which admit of the ready passing away of heated air after being once in contact with them.

The general formula for transmission of heat to contiguous air is

$$W = 0{\cdot}552 \cdot B \cdot (T-t)^{1{\cdot}233}$$

where W = amount of heat transmitted in Centigrade units from the square mètre in 1 hour, T = temperature of heated body, t = that of air before contact, both in degrees Centigrade and B = coefficient, determined by the form of the heated surface.

For horizontal cylinders $B = 2{\cdot}058 + \frac{0{\cdot}0382}{r}$

where r = radius of cylinder.

For vertical cylinders

$$B = \left[0{\cdot}726 + \frac{0{\cdot}0345}{\sqrt{r}}\right]\left[2{\cdot}43 + \frac{0{\cdot}8758}{\sqrt{h}}\right]$$

where r = radius, h = height of cylinders.

For spheres $B = 1{\cdot}778 + \frac{0{\cdot}13}{r}$

where r = radius of sphere.

For vertical planes

$B = 1{\cdot}764 + \frac{0{\cdot}636}{\sqrt{h}}$ where h = height of wall.

Box gives modified forms of these, for English heat units for 1 deg. difference of temperature Fahr., but these do not take account of the fact that as with radiation, so conduction from heated surfaces to the air is more active at high than at low temperatures.

The expressions in English heat units are:—

For horizontal cylinders, $W = {\cdot}424 + \frac{{\cdot}307}{r}$

where W = loss in units per square foot per hour, for a difference of temperature of 1 deg. Fahr., r = radius of cylinder in inches.

For vertical cylinders:—

$$W = {\cdot}2044\left[\left({\cdot}726 + \frac{{\cdot}2163}{\sqrt{r}}\right)\left(2{\cdot}43 + \frac{5{\cdot}49}{\sqrt{h}}\right)\right]$$

where h = height in inches.

For spheres $W = {\cdot}3634 + \frac{1{\cdot}0476}{r}$

where r = radius of sphere in inches.

For vertical planes $W = {\cdot}361 + \frac{{\cdot}233}{\sqrt{H}}$ where H = height of plane in feet.

These expressions are simpler than those originally given, and, though less accurate with high temperatures, are sufficiently so for practical use at ordinary temperatures of atmospheric air, so that, while not applicable to the cases of stoves and furnaces, they are suitable for the walls of ordinary rooms.

Deperdition of heat results also from the conduction of heat through the substance of walls, windows, floors, roofs, &c., as well as by the activity of the processes we have been considering, and which are equally of importance, practically, in the transmission of heat or warming.

The whole process of warming and deperdition of heat thus acts. We, in some one of several ways, introduce a source of heat into an apartment which we desire to warm. Let us suppose, for example, this is a coil of hot-water pipes.

The heat is brought to our coil partly by the conductivity of the iron pipes enclosing the water, partly and principally by the circulation of the heated water. The conductivity of the pipes then transmits part of the heat of the water to the external surface, and we have a heated surface to our coil.

This heated surface then transmits its heat partly by radiation, to the walls, &c., partly by conduction to the air in contact with it. The warmed air carries on the process by imparting part of its heat to those surfaces of the walls, &c., of a lower temperature than itself.

This process will continue, if there are no disturbing influences, till the coil, the air, and the walls are of one uniform temperature, but up to this point there is no real loss of heat, though there has been plenty of transference by the activity of the operations we have been discussing.

Now, however, comes into play the conductivity of the walls, &c., by which heat is transmitted to their external surface. The external surface, being warmed, transfers part of its heat to the external atmosphere and objects, both by radiation and by contact, and every unit of heat thus transferred is lost as far as its value to us is concerned.

The rapidity of this transference varies with the conductivity of the materials of which the walls, &c., are constructed, with their thickness, and with the degree of motion of the external atmosphere. The problem is, of course, still further complicated when the walls are of heterogeneous composition or are hollow, when the windows are double, and so on, so that a considerable number of contingent possibilities have to be taken into account.

OBITUARY.

MR. ALEXANDER PEEBLES, F.R.I.B.A., CITY ARCHITECT.—We regret to announce that Mr. Alexander Marshall Peebles, F.R.I.B.A., F.S.I., the architect to the Corporation of the City of London, died at his residence at St. John's Wood, on Thursday, the 21st inst., after a prolonged illness, and, by a strange coincidence, on the fourth anniversary of the death of his predecessor, Sir Horace Jones. Mr. Peebles was born in March, 1840, at Dalsholm, near Glasgow, and was the second son of the late Alexander Marshall Peebles, of Highbury. He was articled to Mr. Thomas Smith, F.R.I.B.A., the architect to the late Marquis of Salisbury, and subsequently assisted the late Mr. Henry Baker, F.R.I.B.A., the District Surveyor of St. Pancras, and Surveyor to the estates belonging to St. John's College, Cambridge. He started in practice at an early age in Walbrook, and afterwards continued at Salters' Hall-court, Cannon-street. He was District Surveyor under the late Metropolitan Board of Works for North St. Marylebone for many years, and in that capacity was chosen to give evidence in support of an amended Building Act introduced by that body, and did much to improve the construction of theatres before they came under the control of that Board. He also rendered good service to the public in causing the improvement or vacation of the numerous underground dwellings which existed in his district. Among some of the works carried out from his designs and under his superintendence

may be enumerated Trinity Church, Stratford; the mansion, No. 1, Park-lane; the premises of the Life Association of Scotland in Pall Mall; the premises of Sir Henry W. Peek, Bart., in Eastcheap and St. Mary-at-Hill, built after the widening of that thoroughfare; the Hall of the Butchers' Company in Bartholomew Close; Rood-lane Chambers, Rood-lane; Milton Buildings, Watling-street, comprising six premises; the *Daily Chronicle* offices, Fleet-street; eleven business premises at Salisbury-court, Fleet-street; Messrs. Maclure & Macdonald's premises in Queen Victoria-street; the restoration of St. Stephen's Church, Walbrook; premises in High-street, Young-street, and Ball-street, Kensington, for Messrs. John Barker & Co.; premises in Fore-street and Whitecross-street; Messrs. Judd & Co.'s premises, Doctors'-commons; Messrs. Wrigley & Co.'s premises, Budge-row; No. 25, Walbrook, Messrs. Linklater & Co.'s offices; premises in Bond-court, Walbrook, &c., &c. Mr. Peebles had travelled considerably. In 1886 he was a candidate for the appointment of Superintending Architect to the Metropolitan Board of Works, but was defeated by Mr. Thomas Blashill by one vote only. He was afterwards promoted as Surveyor to the vacant district of East Hampstead. He held the appointment of Architect and Surveyor to her Majesty's Lieutenancy of the City of London, to the Trustees and Churchwardens of the parish of St. Stephen's, Walbrook, and to the Select Vestry of St. Mary-at-Hill; Honorary Architect to the Directors of the Royal Caledonian Asylum; and Honorary Surveyor to the Court of the Royal Scottish Hospital. In 1887 he was appointed Architect to the Corporation of the City of London, and thereupon relinquished his practice and other public offices. He was in his fifty-second year, and was buried at Kensal-green on Monday last. The following works by Mr. Peebles have been illustrated in our pages on the dates named:—Offices for the Life Association of Scotland, Pall Mall, June 4, 1881; Hall for the Butchers' Company, July 26, 1884; and premises for Sir Henry Peek, Eastcheap, June 27, 1885.

MR. HARRY OLIVER, F.R.I.B.A.—The death is announced of Mr. Harry Oliver, F.R.I.B.A., District Surveyor of Whitechapel and Spitalfields. He was elected an Associate of the Institute in 1849, and a Fellow in 1862.

MR. HENRY CURZON, A.R.I.B.A.—The death is also announced of Mr. Henry Curzon, A.R.I.B.A., of Tenbury, Worcestershire.

GENERAL BUILDING NEWS.

CHAPEL OF ST. MARY-THE-VIRGIN, BRONDESBURY PARK, BRONDESBURY.—The foundation-stone of the new Chapel of St. Mary-the-Virgin, Brondesbury, was laid on Tuesday last by the Bishop of Marlborough. The chapel is being built in connexion with Miss Clarke's ladies' school in Brondesbury Park, and is the gift of one of the former pupils, Miss Agatha Skinner. The design is simple late thirteenth-century work, with apsidal chancel end. The windows are deeply recessed, with drop arches and shafted jambs internally. The altar is raised seven steps from the nave-floor level. The sanctuary steps are of white Sicilian marble, and the floor is designed to be carried out in glass mosaic. The roof is open-timbered, the principals being carried on to caps of shafted corbels. Accommodation is arranged for 180 adults. A partially-glazed corridor, fitted with seats and flower-shelves, connects the chapel with the school. The materials used are Box Ground and Corsham Down stone and red brickwork. The estimated cost of the building, with necessary fittings, is about 2,500*l.* The architect is Mr. Geo. H. Fellowes Prynne, A.R.I.B.A., of 10, Torrington-square, London. The builders are Messrs. J. & C. Bowyer, of Upper Norwood.

THE MANCHESTER "PALACE OF VARIETIES."—This new building, which was formally opened on the 15th inst., has two frontages, the principal one to Oxford-street, and the other to the new thoroughfare known as Whitworth-street. In several respects it follows the features of the Irving-Darbyshire "safety" plan recently carried out at the new theatre at Exeter, but its main point of divergence is the addition of a second tier of seats called amphitheatre in place of the old "gallery." The principle of isolation which has been adopted as a *sine qua non* by the Manchester County Council has been adhered to. The pit portion of the theatre is below the street level, so as to reduce the height of the amphitheatre as much as possible from the street level. Each portion of the house has its exits communicating directly with the streets. The pit has four exits, counting the entrance one, the grand balcony three, and the amphitheatre four. All the passages, floors, and staircases used by the public and the artistes are of iron and concrete. According to the *Manchester Courier*, the auditorium has been placed parallel with the proscenium instead of as a prolongation of it; or, in other words, the architects have returned to the old Greek form of the semi-circle, which brings the audience nearer to the stage, the proscenium opening being widened to accommodate this expansion of the auditorium. Having decided upon this method of planning, the next point of interest, following the Greek model, was uninterrupted sight lines from each seat. This object has been secured in the following manner:—The eight large columns supporting the superstructure of the two tiers are set back, and the girders resting on them are of a cantilever character, with an overhang for the balcony above. The coupled columns supporting the amphitheatre stand on the back of these cantilever beams, at a position which, for clearness of explanation, may be said to represent the position of the circular wall forming the passage at the back of the old theatre tiers, and through which access is obtained to the seats. There are thus no columns in the circle, and, as there is no tier above the amphitheatre, that portion has a free and uninterrupted view of the stage, and of the top portion of the great auditorium. The ceiling is formed by a large "cove," from which springs an elliptical dome at 60 ft. from the floor. The auditorium is 90 ft. wide, and 66 ft. deep, the stage is 66 ft. by 40 ft. deep, and the proscenium opening 36 ft. wide by 32 ft. 10 in. high. The highest point the audience can reach from the street is 33 ft. 6 in. Carrying out the principle of isolation in detail, in the interior of the building there is no opening of any description except the stage opening in the proscenium wall. The members of the orchestra have a separate entrance and exit from the streets, and the manager passes to the auditorium by a door in the immediate proximity of his own room. The large proscenium opening can be closed in ten seconds by what is described by the journal before-mentioned as a fire and smoke-proof curtain made of the new material, "Titancrete," which has a light specific gravity, and is unburnable. The stage is roofed with the same material, and an immense funnel is formed in the centre which (it is said) will absorb all smoke or poisonous gases in case of conflagration. The artistes are placed on either side of the stage, which is shut off by an automatic Titancrete door, and the dressing-rooms in each wing have an escape staircase which leads direct to the streets. The fly men and paint-room men are similarly provided for, and the stage itself has two exits direct to the streets. All the exit doors are fitted with Kaye's patent automatic exit fittings. In designing the palace, we are told that the architects have been anxious to add something to the street architecture of Manchester, which should not only have dignity and plenty of light and shade, but should, if possible, possess the additional charm of colour. With a view to secure this latter desideratum they decided to attempt a revival of the exterior decoration practised by the Italians of the sixteenth century, such as *Gesso duro* and *Sgraffito*. Italian artists were employed, and, under the guidance of Signor Marolda, this portion of the work has been carried out with a remarkable degree of success. The building has been faced with self-coloured cements. The *Sgraffito* is in red and gold colour, the *Gesso duro* ornament was modelled *in situ*. The general character of the architectural features is Palladian. The internal decorations consist of fibrous plaster ornament in relief, and the colour scheme is cream, gold, and scarlet. The object has been to secure brightness without vulgarity. *Sgraffito* work has been again used in the large coved panels connecting the dome with the walls. The decorative and upholstery work has been carried out by Messrs. Heighway & Son, of Manchester, and Messrs. Heighway & Depree, of London. The theatre has cost a little over 40,000*l.*, and the contract has been carried out by Messrs. William Brown & Son, of Salford. The marble mosaic floors and staircase have been supplied, and the heating and ventilating carried out, by Messrs. Elliot & Co., of Manchester; the ironwork by Mr. John Jones, of Manchester; and the electric light and fittings by Rashleigh, Phipps, & Dawson, of London. The constructive ironwork was executed by Messrs. Bellhouse, with Mr. E. Muir as consulting engineer; and the stage has been built by Mr. Morley. The whole undertaking has been carried out from the designs and under the immediate supervision of the architects, Messrs. Alfred Darbyshire, F.R.I.B.A., and F. Bennett Smith.

NEW BOARD SCHOOLS AT CADOXTON-BARRY.—The formal opening of the new Board School buildings erected on Cadoxton-common by Mr. D. Davies, of Cardiff, at a cost of 4,500*l.*, for the Cadoxton and Merthyr Dovan School Board, took place on the 23rd inst. The architects were Messrs. Seward & Thomas, of Cardiff, and the contractor was Mr. D. Davies.

THE PROPOSED NEW WORKHOUSE FOR HASTINGS.—An animated discussion took place at the ordinary meeting of the Hastings Board of Guardians on the 21st inst., when tenders were received for the building of the proposed new workhouse. The highest tender was 99,891*l.*, and the lowest 78,850*l.* The surveyor's estimate was 85,000*l.*, and the sum of 10,000*l.* has already been spent on the site, and, as the chairman observed, the extras, such as furnishing, &c., would bring the total cost up to about 100,000*l.* Several of the guardians complained strongly against such a heavy expenditure, one saying he was given to understand the cost would not be more than 50,000*l.*, and suggesting that they should tell the Local Government they were not in a position to incur such an enormous expenditure. Eventually the whole matter was referred to the building committee to consider and report.—*Sussex Daily News.*

WESLEYAN CHAPEL AT MARKINGTON, NEAR RIPON.—On the 22nd inst. a new Wesleyan chapel was opened in the village of Markington, near Ripon. The style of architecture is simple Gothic. The chapel will seat about 180 worshippers. A school-room, vestry, and stabling, and other conveniences have been added. The total cost has been about 1,500*l.* The building has been erected under the supervision of Mr. Wm. Croft, of Killinghall, architect.

HOME FOR CHILDREN, CORSTORPHINE, EDINBURGH.—The new home of the Scottish National Society for the Prevention of Cruelty to Children at Corstorphine is now practically completed. The building, which has been erected at a cost of about 4,000*l.*, is in the Elizabethan style, and will accommodate a hundred children. The boys will occupy one wing and the girls the other, but at school, at meals, and in the playgrounds, the sexes will be allowed to mingle. The dormitories, of which there are four, two for each wing, are fine apartments, each providing room for twenty; and, besides these, there are bedrooms for the infants. The dining-room will be used alternatively as a schoolroom, and on the ground floor there is a large recreation room for use in wet weather. The architect is Mr. James Jerdan, George-street, Edinburgh.—*Scotsman.*

NEW CHURCH, LONGTON, STAFFORDSHIRE.—The opening and dedication of the new church of the Holy Trinity at the Meir, Longton, was performed on the 21st inst., by the Bishop of Shrewsbury. The new church is erected upon a site given by the Duke of Sutherland, in a growing district, in the parish of Caverswall. At present there is only a temporary chancel, but when the church is completed it will accommodate about 400 people. It will then consist of a chancel, nave, north and south transepts, vestry, and organ chamber. The estimated total cost is about 2,000*l.* The church is in the Early English style, and is constructed of red brick, with stone facings. At present there is seating accommodation for about 260 persons. The plans were prepared by Messrs. R. Scrivener & Sons, of Hanley, and the contract was executed by Messrs. H. & R. Inskip, of Longton.

NEW ABATTOIRS, ACCRINGTON.—The public abattoirs, erected by the Corporation, on Ellison's Tenement, Accrington, were opened on the 1st inst. by the Mayor of Accrington, Alderman Whittaker. The new abattoirs are erected on land belonging to the Corporation, at the junction of Hyndburn-road and Morston-street, and immediately adjoin the new stables. The entire block, including approaches, out-buildings, and enclosed land for future extensions, covers an area of 3,644 square yards. The buildings are arranged in three blocks or rows; that abutting upon Moreton-street contains one large slaughter-house and lair for cattle, the pig department consisting of slaughter-houses, cooling-room, piggeries, and boiler-house. The other two blocks contain nine and eight slaughter-houses and lairs respectively, and are built parallel to Hyndburn-road. To the right of the entrance is the inspector's house, &c., and at the end of the yard an offal pit and shed. The buildings are divided by paved roadways or alleys. The entrance is from Moreton-street. The buildings have been constructed of stone. The front walls are of pitched faced fronts from Haslingden-grange. The walls are erected on 6-in. footings on a concrete foundation. The division walls are of 9 in. brickwork, and the inner walls throughout are in Portland cement mortar. A dado is formed in each slaughter-house and lair, to a height of 6 ft. 6 in. above the floor level. Staffordshire blue facing bricks have been used for the base or skirting; the remaining portions of the dado are constructed of salt glazed bricks. The upper portions of the walls are of red bricks. The lairs to each slaughter-house are divided for beasts and sheep. The floors of the slaughter-houses and sheep-pens are flagged, the rest of the lair floors being paved with Warmden setts. The drainage and ventilation, it is stated, have received careful attention. The roofs are under-boarded and painted. The outside doors are made to slide by means of wrought-iron hangers and running pulleys on rails fixed over each door lintle; and each lair is provided with a loft for the storage of provender. Each slaughter-house is provided with iron joists; suspended from these by brackets are the galvanised running rails, with their completement of running pulley hooks and chains, all galvanised, for hanging the carcases of the beasts, &c. The doors dividing the slaughter-houses from the lairs are ¼ in. boiler plating, sliding, similar to the outside doors. A verandah is fixed in front of every slaughter-house to protect the doors and ironwork from the weather. Near the stables, and adjoining the piggeries, is the boiler-house, fitted up with a 12 ft. by 5 ft. Cornish steel boiler, with a working pressure of 80 lbs. on the square inch, supplied by Messrs. Anderton & Sons, Antley. The buildings are lighted from the roof by rough-plate glass, and gas and water is laid on to each place. The alleys or streets are lighted with bracket-lamps, and there are the usual drinking-troughs for the cattle. Hydrants are also

fixed for flushing and cleansing purposes. An offal-pit and galvanised offal-carts with sliding doors are also provided. The inspector's house at the entrance contains parlour, living room, scullery, and three bedrooms. The entire cost of the work, including the stable block, will be about 15,000*l.* Messrs. Moore Bros., Rawtenstall, are the contractors; Messrs. Carter & Sons have executed the plumber's work, steam fittings, verandah, &c.; Mr. Henry Wormwell the ironwork and smith's work; and Mr. J. W. Bridge has supplied the hoists, offal-carts, &c. The stables and abattoirs have been erected from plans and under the superintendence of the Borough Engineer, Mr. W. J. Newton.

BISCUIT MANUFACTORY, CARLISLE.—A new biscuit factory, which has recently been erected for Messrs. Carr & Co., has just been opened at Carlisle. The buildings of the new factory are reached from Bread-street, and have a floor space of about 78,000 ft., and consist of four floors in addition to the basement. A large portion of the basement floor will be used as store-rooms. This space is lighted and ventilated by swing windows on the south and east sides in front of continuous areas. The buildings are divided on the ground floor into six sections, the largest section having an area of 18,455 ft., and is set apart for long travelling ovens in conjunction with the patents machine-room, the bakehouse being a one-story wing on the west of the main blocks, with a fire-proof roof. A second large bakehouse, with patent decker ovens, is on the south of the patents machine-room, with warehouse adjoining. A cloak-room and lavatory for the men and boys has been erected in the enclosed yard at the end of Bread-street. The boiler-house and engine-house are both separate buildings, on the south side of the one-story bakehouse, with fireproof construction, the former having a "Galloway" boiler and one of Green's patent economisers to warm the water with the waste heat from the furnaces. The engine-house is finished in coloured glazed bricks and Robinson's cement, and has a deep pit over the whole area in which there has been constructed a long bed for the engine, and a small one adjoining for the dynamo. The steam-engine was made by Pratchitt Brothers, Carlisle. The buildings will be lighted by the electric light, which has been supplied by Messrs. J. H. Holmes & Co., of Newcastle-on-Tyne. The dynamo is fixed in the engine-house. On the first floor there are two large rooms, viz., strong warehouse, capable of storing 1,500 tons of flour, and icing-room over the hand oven bakehouse. The second floors are arranged for packing-rooms and packing warehouse, a small portion being over the railway siding adjoining the premises. The top floors are principally for storing material. A railway siding has been laid into the works from the private railway into Messrs. Carr & Co.'s premises. At the south-west corner of the site is the water-lodge and refrigerator, also the tall chimney-shaft over 170 ft. high. The architect was Mr. T. Taylor Scott, of Carlisle. Messrs. Johnstone Bros. were the builders.

SANITARY AND ENGINEERING NEWS.

SUBWAYS SCHEME FOR SHEFFIELD.—At a meeting of the Highway Committee a few days ago, the report of a sub-committee appointed to consider the question of having subways in the centre of the town was submitted, and the Borough Surveyor presented plans and sections of the suggested subways, which are from below Change-alley, along High-street and Fargate to Cheney-row, and from the Pack Horse Hotel, Snig-hill, along Westbar to Corporation-street. The objects are to provide improved sewers, and accommodation for gas and water mains, electric and telephone wires, pneumatic tubes, &c., and to make side chambers to the respective properties along the routes for the conveyance of house drainage, and the private gas and water services and telephone communication. It is proposed, further, if found desirable, to construct vaults under the footpaths for the convenience of the different occupiers of property, which would be let to them at a rental. It was mentioned that this system of subways, &c., had been extensively adopted in Nottingham for years, and applied to many of the new thoroughfares in the metropolis with most satisfactory results; one great advantage being that it saved the surface being disturbed from time to time. The sub-committee's report was adopted, and it will, therefore, bring the matter before the Council at their next meeting.—*Sheffield Independent.*

THE EDINBURGH WATER SUPPLY.—Following the advice of Messrs. James Mansergh, C.E., of London, James M. Gall, C.E., of the Glasgow Water Trust, and George Hill, C.E., of Manchester, the water authorities of Edinburgh are bestirring themselves with a view to securing new sources of supply for that city. Edinburgh is not a place of very rapid growth, its population having increased only from 254,000 in 1870 to 366,468 in 1891, but even this growth at the same rate will require additional supplies of water ten and twenty years hence,—and even sooner. Looking to the future, therefore, and realising that new sources and new works are not to be obtained in a day, the Water Trust of Edinburgh commissioned the three engineers named to consider the present state of affairs, and the probable future requirements. The results have been recently presented in the form of a report, and are thus summed up:—"The existing waterworks are competent in a period of average rainfall to supply about 15,000,000 gallons per day. In a dry period they will supply only 13,732,542 gallons a day, and, in an excessively dry year like 1870, the yield may be brought down for six months to an average per day of 12,679,542 gallons. The present consumption is practically the 15,000,000 gallons which the works can supply. For 1890, it was given at 14,794,000 gallons. Of this the quantity used for trade and public sanitary purposes, is 3,381,110 gallons, leaving for domestic purposes, 11,412,890 gallons. On a population, according to the 1891 census returns of 366,468, the trade, &c., consumption is 9·22 gallons per head per day (1·28 of which is public sanitary), and the domestic, 31·14 gallons,—making a total of 40·36 gallons. By the investigations we have made, we find that the water-fittings are of defective make and in bad order, but that on repair the domestic consumption can be diminished for a short time by 6·44 gallons per head, reducing the 31·14 to 24·70. We are of opinion that if proper measures, such as we recommend, are taken to discover and stop the preventible waste, the domestic consumption may be brought down to 24 gallons per head, including the 1·28 gallons now used for public sanitary purposes. Deducting the 1·28 gallons from 19·22 gallons there is left 7·94 gallons as the trade supply by meter or agreement. We therefore say the present consumption for all purposes should be 24+7·94=31·94 gallons per head per day. In forecasting future requirements we assume that the domestic consumption (with the public sanitary) can be brought down to 24 gallons per head per day in three years. On these premisses, it follows that if a very dry period were to come now, you would be short of water in 1891 and 1892, that if the fittings are made right in three years you would have a small surplus in 1893-4-5 and 6, but that in 1897 the means of supply would be in defect of the demand, and would become increasingly so every succeeding year. Under these circumstances, it is imperative that you proceed at once to provide for bringing in an additional supply. We therefore recommend that your engineers proceed immediately to obtain such further information with regard to the several schemes already reported on by them, as will enable us to advise jointly with them as to which of the schemes should be adopted." The report is very exhaustive and instructive, and has effectually aroused the Water Trust to the position in which they are or may find themselves.

DRAINAGE SCHEME, PONTYPRIDD.—A meeting of the Pontypridd Local Board took place on the 21st inst., when the question of the subsidiary drainage scheme was discussed. It was decided to apply to the Local Government Board for sanction to borrow 25,000*l.*, repayable in thirty years, for the purpose of carrying out the undertaking.

FOREIGN AND COLONIAL.

FRANCE.—The Société des Beaux-Arts of the departments has been holding its fifteenth sitting, from the 22nd to the 27th of this month, under the presidency of the Minister of Public Instruction. ——The nineteenth annual congress of French architects will be held at Paris from the 15th to the 20th of June.——The Société Régionale of the architects of the North of France has founded medals for presentation to art-workmen of French nationality domiciled in the Departments du Nord, Pas-de-Calais, and La Somme.——The tenders for the work required for the utilisation of the sewage of Paris in the Plain of Achères have been accepted. The works include the construction of an aqueduct over the Seine opposite Argenteuil.——All the works commenced by Chapu and left unfinished in his studio are to be completed by or under the direction of MM. Dubois, Falguière, and Mercié. Among the number is the bust of Duc, the architect, for the Palais de Justice of Paris, two marble statues for the Hôtel de Ville, the statue of Balzac commissioned by the Société des Gens de Lettres for the Palais Royal, and lastly that of Lord Byron, intended for Greece.——The Académie des Beaux-Arts have elected as corresponding members, in the section of Architecture, M. Martenot, of Rennes, in place of the late M. Durand of Bordeaux, and Mr. Waterhouse, of London, in place of the late M. Sarti of Rome. At the same sitting the Académie awarded the Prix Deschaume to a young architect, M. Bouché.——The inauguration of the Garibaldi monument at Nice, designed by M. Deloze, has been adjourned to September. ——The retrospective exhibition at Pau proves to be very interesting. There are about two thousand different objects, including paintings, sculpture, tapestries, goldsmiths' work, ceramic ware, &c.—— M. Léon Majour, a government architect ("diplomé") has obtained the first premium in the competition at Melun for the construction of a building for the departmental archives of the Seine and Marne.——M. Marquet de Vasselot, the sculptor, has been commissioned to execute a marble bust of Maréchal Suchet for the Hôtel of the Préfecture of Lyons.——M. Armand Dayot, Inspecteur des Beaux-Arts, has been commissioned to organise a modern and retrospective exhibition to be opened at St. Brieuc on June 13.——At Dax on the 21st of the month, the statue of the mathematician, Borda, was inaugurated by the President of the Republic. The statue, the work of M. Aubé, is erected on the Place de la Halle, by the side of the Cathedral.—— Two disgraceful acts of vandalism are among the records of the week; one of the fine windows of the Cathedral of Chartres has been broken by persons forcing an entrance into the cathedral; and a fine statue ("Laïs") in the Tuileries garden has been wilfully damaged.——A Belgian Committee has been formed to erect a monument at Antwerp to the memory of French soldiers who died there in 1832, fighting the emancipation of Belgium.—— M. Ferrary, author of the statue of Phryne which figures this year at the Champs Elysées, has been commissioned to execute a marble bust of Mehul to be erected at Givet (Ardennes), the birthplace of the musician.——The death is announced of M. Viel, member of the Société Centrale des Architectes since 1848. M. Viel, who was seventy-seven at the time of his death, was a pupil of Hippolyte Lebas and of Labrouste, and had assisted in the carrying out of the old St. Lazare railway-station. Otherwise he had principally occupied himself with works of domestic architecture.

A NEW INTER-SCANDINAVIAN RAILWAY.—A plan is being promoted by a syndicate of English capitalists for the construction of a line of railway from the Ruativare and Wallati iron deposits and the Alkavare and Silbatto silver mines in Swodish Lapland, to the sea border of Norway. The former deposits are very rich in iron, and cover some 4,000,000 square feet. The railway would be constructed on the Decauville system, and is estimated to cost 200,000*l.* The cost of breaking out the ore is estimated at 7d. per ton, and this and the transport of the ore to the coast at 3s. 8d. per ton, being only one-half of the cost at present of the celebrated Gellivara ore in the port of Lulio on the Baltic.

AN EIFFEL TOWER ON MOUNT PILATUS.—According to the *Tageblatt* of Luzerne, a scheme is being prepared by certain Swiss *entrepreneurs* for the erection of an Eiffel Tower on the summit of Mount Pilatus, whither there is now a railway. It is asserted that the clouds so often marring the view from the top only have a height of some 30 mètres, and it is therefore proposed to erect a tower near the Hôtel Bellevue, 280 mètres in height, whence generally there would be a splendid view of the Alps. It is intended to build the tower of steel, and it is to be composed of two open-work cylinders, the ascending and descending paths lying between them. The top platform would afford accommodation for some 400 persons, and also boast a restaurant.

MISCELLANEOUS.

A MASTER BUILDERS' ASSOCIATION FOR CORNWALL.—A meeting of master builders of the county of Cornwall (convened by circular by Mr. James Julian, of Truro), was held last week, at the Red Lion Hotel, Truro, to consider the desirability of forming a local association to act in conjunction with the National Association of Master Builders of Great Britain. Most of the large builders and contractors attended, viz., Messrs. Thomas Lang (Lang & Sons, Liskeard), Mr. Trehane (Liskeard), Mr. Carkeek (Redruth), Messrs. James Julian & Harris (Truro), and also representatives from Fowey, Camborne, and St. Ives. Mr. Lang was voted to the chair, and explained the objects in forming such an Association. Correspondence and various rules of other builders' associations throughout the country were read by Mr. Julian, when it was unanimously resolved: "That in the interests of the building trade it is desirable to form a County Local Association, and that a committee consisting of five be appointed to meet at an early date to draw up rules and regulations for the formation of the association, to be presented at another general meeting of builders for approval, the committee consisting of Messrs. Lang, Trehane, Julian, Carkeek, and Caldwell (of Perkins and Caldwell, Penzance)."

THE ENGLISH IRON TRADE.—There is very little business stirring in any of the branches of the English iron market, and the prospects for the future are far from bright. Scotch warrants are still held up and are very scarce, but makers' iron remains quiet, and practically unchanged in value. Middlesbrough pig is 1s. lower on the week, and mixed numbers of Bessemer iron in the north-west have been lowered 1s. 6d. per ton to 52s. to 53s. The manufactured iron trade remains quiet, and the probable partial stoppage of the Eston works is an indication that work is very slack in the north of England. The market for tin plates is a trifle firmer. There is but little life in the steel trade, although shipbuilding material is in slightly better demand, owing to the prospects of orders for new vessels shortly coming to hand. Engineers are fairly well employed, but new inquiries are only coming forward slowly.—*Iron.*

THE SWEDISH SAMPLE OFFICE IN LONDON.—The Swedish Government has granted a sum of 650*l.* to the Swedish Export Association towards the establishment of a sample office of Swedish manufactures in London.

CONTRACTS AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Forming and Laying-out of a Public Park	Stockton-on-Tees Corp.	K. F. Campbell	June 1
*Re-laying Pipe Sewer	Waltham Holy Cross Local Board	C. W. Wiggs	do.
*Water Drain, Manholes, &c.	Mortlake Dist. Highway Board	H. Richards	do.
Waterworks	Shipley Local Board	W. B. Woodhead & Son	June 2
Painting and Colouring the Union Workhouse, Torpoint	St. German's Union...	.....	June 3
Four Cottages, &c. Ward's Yard, Northallerton	.....	P. Horne	do.
Laying 12 miles of 24 in. and 18 in. Gas Mains	Sunderland Gas Co. ..	.....	do.
550 yds. of 9 in. Pipe Sewers, &c. Newton, Blaenau, Gwent	Abertillery Local Bd.	*Official*	do.
400 yds. Cube of Guernsey Granite, Royal Engineer Yard, Mill Lane, Woolwich	War Department	do.	do.
*Paving &c. Works	Hove Commissioners	do.	do.
*Road Making and Paving Works	Fulham Vestry	W. Sykes	do.
Six Villa Residences, Sowerby Bridge	.....	Lloyd & Son...	June 4
Alterations and Additions to Dispensary Building in the Houndwell, South'pton	Guard. of the Poor	.....	do.
Altering and Improving Christow Bridge	Devon County Council	H. Harbottle	do.
Alterations, &c to Brynhytryd Baptist Chapel, Ebbw Vale	The Trustees.....	L. Samuel	do.
Rails, Sleepers, Fishplates, and Bolts and Nuts	H. H. the Nizam's Guaranteed State Railways Co...	.....	do.
Paving, Curbing, and Channelling, Culvert-street, Newent	Newent Local Board	.....	do.
Relining in Brickwork of Reservoir, at Richfield, Pendleton	Borough of Salford..	*Official*	June 5
*Cottages and House, Timber Drying Shed	M. R. Co.	do.	do.
*Cleaning and Painting Stations, &c.	do.	do.	do.
*Wood Paving Works	Commrs. of Sewers ..	do.	do.
Dwelling-house and Blacksmiths' Shop, Bovey Tracey, Devon	J. Moore	Samuel Segar	June 6
House at Lustleigh, Devon	J. Elliott	do.	do.
Painting and Cleaning Schools, Gateshead	The School Board	.....	do.
Repairs and Alterations to Taibach Bridge	Glamorgan C. C.... ..	.....	do.
*Private Waterworks, Baan Manor Park and Woodhouse	.....	G. Hodson.....	do.
Hospital Block, Stirling District Asylum, Larbert	.....	A. & W. Black.....	June 8
Additions to Bartenins Court, near Hereford	.....	Nicholson & Son.....	do
Re-construction of Pipe Sewerage, Sneyd Park, near Bristol	Barton Regis U.R.S.A.	A. P. J. Cotterell	do.
Extensions to School, Walton-on-the-Hill, Lancs	The School Board	E. Kirby	do.
*Swedish Yellow Deal Wood Paving Blocks	St. Marylebone Ves...	*Official*	do.
*school at Manor Park	East Ham School Bd.	R. L. Curtis.....	do.
*Painting Wellington Barracks	War Department	*Official*	June 9
*Water Supply Works	Newton Abbott U.R.S.A	S. Segar	do.
*Paving High-street, Stratford	West Ham Council ..	Lewis Angell	do
*Roadmaking and Paving Works	Willesden Local Board	O. Claude Robson	do.
*Pipe Sewer and Surface Water Drains, &c.	do.	do.	do.
*Steel Girder Bridge	do.	do.	do.
Supply of School Furniture	Walthamstow Sch. Bd.	*Official*	do.
Steelwork, &c. for Bridges, Steel Bearing Plates, &c.	India Office	.....	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Enclosing Show Yard, erecting Grand Stand, Horse Boxes, &c. Exeter	Exeter Horse Show Society.....	W. S. Croote	June 9
Infirmary at the Workhouse, Keelsedl, Bierlow, Yorkshire	The Guardians	T. G. Edwards.....	do.
*Supply of Road Material	Lewisham B. of W. ..	*Official*	do.
*Reconstruction of Sewer.....	Mile End Old Town Vestry	J. M. Knight	do
Wesleyan Chapel, New Ferry, Birkenhead	Building Committee..	T. W. Cubbon	June 10
*Timber, Iron, and General Building Materials	War Department	*Official*	June 12
*Postal Sorting Office at Forest Gate	Com. of H.M. Works	do.	do.
*Additions to Stables	G. E. Ry. Co.	do.	June 13
House of Recovery, Moorwood, Leeds	Governors	W. H. Thorp.....	June 15
*Gas Engines, Pumps, and Machinery	Hendon Local Board ..	S. S. Grimley	do.
*Construction of Main Outfall Sewer, &c ..	do.	do.	do.
*Building Materials	School Bd. for London	*Official*	do.
*Road Works	Hanwell Local Board	do.	June 16
*Removal of Dust and Ashes	Acton Local Board....	do.	do.
*Sewerage Works	Tottenham Loc. Bd.	J. R. Worth.....	do.
*Wood Paving	Strand Board of Works	*Official*	do.
Enlargement of Butlock's Heath School	Hound School Board..	W. B. Hill.....	June 17
*Sewerage Works	East Barnet Valley Local Board	G. W. Brunnell	June 22
*Dredging Works	Medway Conservators	*Official*.....	do.
Repair of Roads at Public Bridges.....	Lancaster C. C.	do.	June 30
*Erection of Stables, &c. Hoddesdon	County of Hertford ..	Urban A. Smith	No date
Stone-Walling, &c, A New Coal-House ..	Aberdare Gas Co.	.....	do.
Residence, near Neath	.....	J. Buckley Wilson & G. Mosham.....	do.
Adapting Premises for use as Infants' School, Bedwellty, Mon.	School Board	.....	do.
Business Premises, Newport, Mon.	A. W. Bland.....	Habershon & Fawckner	do.
Rutherford College, Newcastle-on-Tyne ..	.....	Oliver & Leeson	do.
Hotel at Blaen Llynvi, near Maesteg ...	.....	G. F. Lambert.....	do.
School, Latrines, and Playground, &c. Carlisle	School Board	T. Taylor Scott	do.
Sewering, Levelling, Paving, Metalling, &c. Streets, Neale	Local Board	C. A. Ewing	do.
Brick Gasholder Tank, West Stanley Colliery	.....	.....	do.
Alteration and Enlargement of St. Mark's Church, Low Moor.....	.....	Healey & Healey.....	do.
Three Houses, Commercial-road, Halifax..	.....	R. Horsfield	do.
Stabling and Alterations to House, Great Bowden, near Market Harborough	.....	William Hull	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Assistant Inspector of Nuisances	Vestry of St. John's, Hampstead.	100*l.*	June 3
*Clerk of Works	Wood Green Local Bd.	2*l.* 10s. weekly	June 6
Sanitary Inspector and Surveyor	Bradfield U.R.S.A.....	200*l.*	June 15
*Surveyor	Ilfracombe Loc. Bd ..	.....	June 22
*Clerk of the Works	Essex County Council	.....	No date

Those marked with an Asterisk (*) are advertised in this Number. Contracts, pp. iv., vi. *and* viii. *Public Appointments, p.* xx.

SCOTCH ARCHITECTURAL PARTNERSHIP. — Mr. Alexander Brown has removed his office to No. 17, Union-terrace, Aberdeen, and, having assumed his assistant, Mr. George Watt, as partner, the business will now be carried on under the firm name of "Brown & Watt."

ROYAL STATISTICAL SOCIETY.—At a meeting of this society, held on Tuesday last, the President, Dr. F. J. Mouat, F.R.C.S., LL.D., in the chair, a paper was read by Dr. Venn, of Caius College, Cambridge, on "The Nature and Use of Averages." The general object of the paper was to show that the prevalent habit of almost implicit reliance upon the common arithmetic mean or average of a number of magnitudes, perfectly justifiable as it is in many cases, needs some revision and caution. An average of any kind,—and there may be many kinds, for any intermediate value, obtained by some definite rule from a number of various magnitudes, is a mean or average,—is simply a single fictitious substitute of our own for the plurality of actual values which we have before us. It is impossible that it should adequately take their place for purposes in general, but must be employed to fulfil this or that special purpose; and the particular kind of average to be selected must depend upon the particular kind of purpose in view.

ROYAL CONSIDERATION FOR ARCHITECTS.—According to the *Pall Mall Gazette*, the Queen of Spain's reason for retarding the completion of the palace which is being built at San Sebastian has at last been divulged. The palace is built privately by the Queen, and it is in order to prevent overdrawing her banking account that she has determined to have the building finished only in the course of next year, when she is able to pay the architects.

SUBSIDENCES IN CHESHIRE.—So far from accepting the decision of the House of Commons,—as described in the *Builder* of May 2 (p. 359),—upon the Bill for providing compensation for subsidences through brine pumping in the "salt districts," the Salt Union are resolved to again contest the measure, and with renewed energy, in the House of Lords. The Bill, as it left the Commons, authorises the formation of compensation boards, who shall have power to levy a rate not exceeding 3d. per 1,000 gallons of brine pumped per annum, out of which tax owners of property damaged by subsidence shall be compensated. This compensation is, however, by amendments in Committee and new clauses, withheld from railway and canal companies (who benefit by the salt traffic), County Councils, and other local authorities, gas and water companies, and persons deriving rents or royalties from brine pumping; compensation going only to owners of property who have no direct interest in the industry from which they sustain injury. The Committee, it may be remembered, accepted little or no scientific evidence on the question whether these subsidences were or were not really due to the pumping, taking the view that millions of tons of salt could not be taken away without some damage being done. The Salt Union make this one of their strong grounds of contention, and they intend to put forward all the scientific evidence they can induce the House of Lords Committee to receive. In this connexion they assent that "in the opinion of eminent scientific men who have specially studied the subject, the subsidences cannot be entirely due to brine pumping, because if brine pumping ceased altogether, subsidences would occur from purely natural causes, as they have in fact occurred in olden times before brine pumping was commenced, and as they do in fact occur at the present time at places so far away from any pump as to make it certain they are not caused by pumping." The Bill provides that compensation shall be given for damage after the passing of the Act, and that the maximum rate shall be levied in the first year; and upon this the Salt Union complain that under that condition compensation will have to be imposed before any evidence is brought that fresh damage has been caused by brine pumping, or any claims can be investigated, and, therefore, the brine-pumpers will in effect be compelled to provide an advance compensation fund, thus offering encouragement to claimants who have acquired their properties with known liability to subsidence, whilst others have built on ground known to be sinking. They also argue that it is manifestly unjust that the present brine-pumpers should have to provide compensation for damage which, though happening after the passage of the Act, has been mainly owing to natural causes, aided possibly by the old workings and excavations by former proprietors.

THE CENTRIC PEN.—This is a pen made with a flat shoulder above the nib, fitting into a slit on the central axis of the penholder. The object is to fix the pen so that no ink can run up to the fingers, and the pen can be laid down without the ink coming in contact with the table.

NORWEGIAN TRAVELLING STIPENDS. — The Norwegian Government has granted stipends amounting to 500*l.* to various gentlemen for the purpose of studying certain subjects abroad, including one to Herr Erling Utne for studying architecture; and one to Herr H. Seckusen for studying the dressing of stone for architectural purposes abroad.

A LARGE CLOCK.—The New York *Architecture and Building* says that "the clock for the new Philadelphia City Buildings is to be worthy of that magnificent structure. The centre of the dial (25 ft. in diameter) will be 351 ft. above the street. It is anticipated that it will take a year to place the clock machinery in the tower after the building has been completed. The bell is to weigh between 20,000 lbs. and 25,000 lbs., and will be second in weight to the Great Montreal Cathedral bell, which weighs 28,000 lbs., and it is expected that its peal will be heard even to the most distant part of the city. Chimes similar to those of Westminster clock will be used, ringing at the quarter, half, three-quarter, and hour. To distinguish the time at night the dial will be illuminated by electricity, so that the position of the hands can be seen from any point of the city. The minute hand is to be 12 ft. and the hour hand 9 ft. in length, while the Roman figures on the dial will measure 2 ft. 8 in. in length. A steam-engine will be placed in the tower for the purpose of winding up this most wonderful timepiece each day."

THE TELEPHONE IN SWEDEN.—On March 31 last the cost of the Swedish state telephone net amounted to 132,000*l.* The length of the same was 7,625 miles, with 5,700 apparatus. In 1883 the telephone net was about half of its present length.

BUILDING BY-LAWS AT CARDIFF.—A special meeting of the Public Works Committee of the Cardiff Corporation was held at the Town-hall, on the 21st inst., for the purpose of considering the new by-laws for the control of building operations in the town and other works of public or private improvements. Alderman D. Lewis presided. With the exception of one or two suggested alterations, which were ordered to be printed, it was resolved that the by-laws be adopted subject to the approval of the Local Government Board.—*Western Mail.*

CAPITAL AND LABOUR.

THE LOCK-OUT OF CARPENTERS AND JOINERS IN LONDON.—In accordance with the terms of the ultimatum of the Central Association of Master Builders, the terms of whose notice expired on Saturday, upwards of sixty firms have closed their shops and jobs to the carpenters and joiners in the London district. These firms no doubt include most of the principal London master builders, who have almost without exception closed their shops and jobs against carpenters and joiners. It is stated on the masters' side that upwards of 5,000 men are directly affected by the lock-out. These firms are still carrying on those works where carpenters and oiners can at present be dispensed with, but in the event of the struggle continuing it must necessarily involve the enforced idleness of the other trades, which would probably increase the number of unemployed ten-fold. The figures given do not by any means approach the number who are indirectly affected. The week before the lock-out began many hundreds of workmen were discharged, and we hear of numerous jobs which by this time would have been started, but which are now abandoned or postponed. The operatives, on the other hand, do not admit that so many men as the masters say are affected by the lock-out, and

they express themselves as confident of carrying their demands,—a forty-seven hours' week, and an increase of wages from 9d. to 10d. per hour. The Executive of the United Trades' Committee of Carpenters and Joiners met on Wednesday evening at Agar-street to discuss the present outlook, and arrange for the distribution of the week's strike pay. The contracts of firms struck against are still left unfinished, and the masters, it was stated, had not yet succeeded in procuring the services of new men to fill the vacancies caused by the strikers. Delegates are about to visit some of the large industrial centres during the next few days in order to promote the interests of the amalgamated societies. Arrangements have already been made for holding meetings of workmen in Coventry, Ashton-under-Lyne, Manchester, Birkenhead, and Liverpool. The branch organisations in the districts of Richmond and Forest-hill have voluntarily imposed a weekly levy in aid of the locked-out men.

IPSWICH BRICKLAYERS. — The bricklayers of Ipswich are desirous of obtaining a halfpenny per hour increase of wages, and very shortly the demand will be laid before the employers. Last week the Eastern Counties Labour Federation called a meeting of the bricklayers, which was held in the Co-operative Hall, to hear the opinion of men who do not belong to the Bricklayers' Society as to their feeling on the subject. The members of the society are unanimously in favour of the demand. Mr. Joseph Robinson (Secretary of the Eastern Counties Labour Federation) was voted to the chair, and there were about 100 present. The non-society men agreed to join the society, and to co-operate with the existing society men in the attainment of their object.

MEETINGS.

SATURDAY, MAY 30.

Artists' Benevolent Fund. — Anniversary Dinner, Freemasons' Hall. 7 p.m.

St. Paul's Ecclesiological Society.—Visit to Shenfield and Hutton, under the guidance of Mr. F. Chancellor, F.R.I.B.A. Train leaves Liverpool-street at 2.45 p.m.

Royal Institution.—Professor A. H. Church, M.A., F.R.S., on "The Scientific Study of Decorative Colour." I. 3 p.m.

Edinburgh Architectural Association.—Annual Excursion, Kinross House, Tullibole Castle, Aldie Castle, Cleish Castle, and Dowhill Castle.

MONDAY, JUNE 1.

Royal Institution.—General Monthly Meeting. 5 p.m.

Society of Engineers.—Mr. John Kerr on "Portable and Pioneer Railways." 7.30 p.m.

Clerks of Works' Association (Carpenters' Hall).—Monthly Meeting. 8 p.m.

TUESDAY, JUNE 2.

Royal Institution.—Dr. Charles Waldstein on "The Discovery of the Tomb of Aristotle." 9 p.m.

Society of Biblical Archæology.—8 p.m.

WEDNESDAY, JUNE 3.

British Archæological Association. — 1. Mr. H. Syer Cumings, F.S.A. Scot., on "Vessels of Samian Ware." 2. Mr. A. Canham on "The Archæology of Crowland." 3. The Rev. Cave-Browne on "Penenesden Heath." 8 p.m.

THURSDAY, JUNE 4.

Royal Archæological Institute.—1. Mr. E. Peacock on "Mortars." 2. Mr. J. L. André on "Symbolic Animals in English Art and Literature." 3. Rev. W. Miles Barnes on "Thirteenth-Century Glass in Bradford Peverell Church, Dorset." 4 p.m.

Society for the Encouragement of the Fine Arts.—Third Conversazione, at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly.

Society of Antiquaries.—8.30 p.m.

SATURDAY, JUNE 6.

Royal Institution.—Professor A. H. Church, M.A., F.R.S., on "The Scientific Study of Decorative Colour." II. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

6,089.—DISCHARGE APPARATUS FOR CISTERNS, &c. : *J. Eckersley and others.*—According to this invention, a weighted lid or disc closes by its own weight the upper end of the vertical outlet aperture through which the water is discharged. The weighted valve, lid, or disc, hangs by a chain from the inner arm of the ordinary pull-down lever, and immediately above the disc is an elongated slotted link, which, when the disc is raised,—by the lever being pushed over on to a projecting horizontal arm, by the pressure of a finger on a supplementary float-ball lever, and being also pushed off again when the water level has fallen below a given point,—causes the disc to drop and close the outlet.

7,215.—FOUNDATIONS FOR LIGHT BUILDINGS : *D. Allport.*—This invention consists of an iron collar in combination with a post or rail. The collar is formed by a plate strengthened by ribs with a hole through the plate enabling it to be passed over the post when the latter has been driven home to the proper level. The collar is made with upright flanges projecting beyond the top of the post to embrace the sill of the building to which it may be secured by screws, bolts, or spikes.

8,682.—CHIMNEY-TOPS : *G. Calvert.*—The passage of the flue is contracted or gathered in the form of a bell or cone, by inserting a bell tube with fluted grooves. Round the sides of the chimney-pot holes are cut to admit currents of air to draw the smoke upward, and divert any down draught or moisture. The hole in the top of the bell tube is sufficiently large to allow a sweep's brush to pass.

8,711.—RAIN-WATER PIPES : *J. B. Millar.*—This invention relates to the construction of pipes formed with segmental projections at their faucet and spigot-jointing ends, secured together by removable "ear" or annular coupling bands. By this invention any intermediate or individual pipe of a set can be removed or replaced without disturbing the others.

9,440.—HINGES : *H. Schlund.*—The strip or blank for the hinges is formed as a long strip, flat and straight, with a central ridge on one face of the metal. It is rolled or pressed, and a wire inserted; then the hinge is formed by universal collapsing dies, or such-like means, and the strip is afterwards cut into proper lengths for hinges.

464.—FASTENINGS FOR CASTORS, DOOR-KNOBS, &c. : *J. Thinnes.*—The fastening which is the subject of this patent combines in its structure a rod having at one end an enlarged angular head, and at its other end a screw-thread, a nut, and a tubular sleeve. Each angle of the head of the rod has a seat in the recess between the sections of the sleeve to prevent the rod turning when drawn within the sleeve.

2,457.—ROOFING MATERIAL : *J. N. Hopper.*—The material which is used by the inventor consists of a layer of woven wire or reticulated material, having its interstices or meshes closed with a plastic mass combined with a second layer of fabric saturated with a similar filling material, and incorporated with or adhering to the woven wire layer.

4,672.—STUCCO : *E. Olson.*—According to this inventor, a compound decoction of hickory bark, tar, and gum is used to mix with the stucco and sand. It sets and hardens very quickly, and finishes smoothly. It may be coloured by mixing pigments with the compound.

NEW APPLICATIONS FOR PATENTS.

May 11.—8,043, A. Schadler, Window Sash-fastener, &c.—8,065, C. Pond, Paint Brushes.

May 12.—8,133, T. Rogers, Water-closets.—8,138, A. Bayley, Tip Waggons.—8,140, A. Boult, Carving Machines.—8,147, W. Thompson, Drains for Buildings, &c. —8,161, H. Lake, Manufacture of White Lead.

May 13.—8,202, P. Nessi, Lamps or Hand Stoves for burning off paint.—8,208, E. Pickford, Gas-light Ventilator and Reflector.—8,233, G. Bischoff, Cowls and Ventilators.—8,234, E. Davis and T. Baldwin, Joint for Coupling Pipes, &c.

May 14.—8,281, E. Ingrey, Sash-fastener.—8,232, W. Wilkinson and J. Miles, Removal of Paint, Varnishes, &c., from Surfaces.—8,287, J. Hodgson and E. Sheard, Coating the Surfaces of Walls and Buildings with Sand or other similar Material.—8,296, A. McLean, Transparent Coloured Material for Decorative Purposes.—8,300, C. Alldred, Jointing of Stoneware Pipes.—8,311, G. Chambers and others, Manufacture of White-lead.—8,324, W. Smith and J. Claydon, Sash-fasteners.—8,325, A. Tanes, Window Sash-fasteners.—8,327, E. Tilley, Window Sash-fasteners.

May 15.—8,391, J. Walker, Window-sash Fasteners.—8,406, W. Horn, Spirit-level, Plumb, and Clinometer.—8,414, P. Kraus, Construction of Watertight and Fireproof Pipes, Roofings, Walls, and Linings.—8,416, J. Fryer, Ventilating Cowl.

May 16.—8,425, J. Hartley, Fixing Joiners' Work in Houses and other Buildings.—8,461, W. Hayhurst, Joiners' Cramps.—8,462, B. Goldmann, Manufacture of Paints, Oils, and Fully Oils.

PROVISIONAL SPECIFICATIONS ACCEPTED.

5,890, W. Trousdale and J. Thompson, Bolts for Lavatory and other Doors.—6,778, U. Sipos, Stove.—6,839, J. Fairbank, Gas-fittings.—6,922, A. Damp, Water-closet Cisterns.—6,924, E. Bilton, Glazing Pottery, &c.—7,145, W. Allen, Automatic Basin of any required section with revolving action for Flushing Water-closets.—7,359, J. Merrill, Syphon Flushing Cisterns.—7,411, W. Mackinnon, Chimney Cowl.—7,510, R. Mahaffy and E. Fitzgerald, Air Propelling or Ventilating.—7,534, J. Williams, Glazing.—7,727, D. and F. Platt, Die or Dies for use in making Dividedable Tiles.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

10,980, J. Ratcliffe, Earthenware and other Pipes.—11,279, Gibbons, Hinton, & Co., Ornamental Tiles. &c.—5,690, F. Kelsey, Spring Hinges.

SOME RECENT SALES OF PROPERTY :

ESTATE EXCHANGE REPORT.

MAY 11.—By *T. G. Wharton* (at Crayford) : Five plots of f. building land, Dartford Heath-rd., Crayford, 279*l.*

MAY 19.—By *Chinnock, Galsworthy, & Co.* : Nos. 64, 66, and 68, New Oxford-st., u.t. 34 yrs., g.r. 115*l.*, r. 462*l.*, 4,660*l.*—By *F. J. Bisley* : 16, Monnow-rd., Bermondsey, u.t. 51 yrs., g.r. 5*l.* 12s. 6d., r. 39*l.*, 400*l.* ; 12, 14, 16, and 18, Litlington-st., Rotherhithe, u.t. 51 yrs., g.r. 18*l.*, r. 98*l.* 4s., 510*l.*—By *M. Lell* : 5 and 6, Charles-st., Poplar, u.t. 59 yrs., g.r. 6*l.* 10s., r. 46*l.* 16s., 265*l.* ; 93, Crisp-st., u.t. 55 yrs., g.r. 8*l.*, r. 45*l.*, 465*l.* ; 121, Grundy-st., f., r. 19*l.* 10s., 135*l.* ; 149, Brunswick-rd., Bromley, E., u.t. 47 yrs., g.r. 3*l.* 10s., r. 27*l.* 6s., 195*l.* ; 3, 6, 7, and 8, Railway-st., f., r. 93*l.* 12s., 1,095*l.* ; 8, 5, and 7, Byron-st., f., r. 74*l.* 2s., 765*l.*

MAY 20.—By *Phillips, Lee, & Davies* : 133, King's-cross-rd., King's-cross, f., r. 50*l.*, 1,200*l.* ; 94 and 96, St. John's-rd., and 3 and 5, Ivy-st., Hoxton, u.t. 12 yrs., g.r. 10*l.*, r. 163*l.* 8s., 380*l.*

MAY 21.—By *Daniel Watney & Sons** : "Ashley Green Farm," Chesham, Bucks, containing 114a. 2r. 11p., f., 2,820*l.* ; "Nashleigh Farm," containing 92a. 3r. 26p., f., 2,370*l.* ; two enclosures of land, containing 12a. 3r. 7p., f., 530*l.* ; a plot of f. building land, Mansfield-rd., Croydon, 340*l.* ; a plot of *l.* building land, Newark-rd., 340*l.* ; three plots of f. land, Sussex-rd., 1,010*l.*—By *G. Brinsley* : 20, Crystal Palace-rd., East Dulwich, u.t. 76 yrs., g.r. 4*l.* 4s., r. 20*l.*, 200*l.* ; 37, Noel-st., Islington, f., r. 42*l.*, 625*l.* ; 6, Idmiston-st., Stratford, f., 210*l.*—By *John Bussey* : 62 and 64, Glengall-rd., Poplar, u.t. 50 yrs., g.r. 6*l.* 8s., r. 46*l.* 16s., 215*l.*—By *Jenkins & Sons* : 31, 33, and 35, Kingsland-rd., Kingsland, u.t. 10 yrs., g.r. 22*l.* 10s., 425*l.* ; 28 and 30, Regency-st., and 55, Vincent-st., Westminster, u.t. 13 yrs., g.r. 1*l.* 13s. 6d., r. 100*l.*, 305*l.*—By *Maddox & Son* : No. 56, Maida Vale, u.t. 81 yrs., g.r. 17*l.*, 1,200*l.*—By *Newbon & Co.* : "The Fox" beer-house, West-street, Mile End, f., r. 42*l.*, 600*l.* ; 32 and 34, Cowper-rd., Stoke Newington, f., r. 53*l.*, 765*l.* ; 9 and 11, North-rd., Clapham, u.t. 50 yrs., g.r. 16*l.*, 1,015*l.* ; 7, River-st , Pentonville, u.t. 2 yrs., g.r. 85*l.*, r. 140*l.*, 40*l.* ; 42 to 62 (even), Kingslake-st., Old Kent-rd., u.t. 16 yrs., g.r. 43*l.*, r. 122*l.* 11s., 100*l.* ; 1 to 13, St. Dunstan's-st., Forest-gate, u.t. 89 yrs., g.r. 42*l.*, r. 249*l.* 12s., 1,120*l.* ; 3, 4, 5, and 6, Lyndhurst-villas, u.t. 89 yrs., g.r. 24*l.*, r. 109*l.* 4s., 535*l.* ; an enclosure of land, Edmonton, 2a. 2r. 17p., f., 800*l.* ; f.g.r. of 14*l.* 8s., with reversion in 30 yrs., Waterloo-rd., Lambeth, 440*l.* ; 21, 23, and 25, Spurstowe-rd., Hackney, u.t. 83 yrs., g.r. 18*l.*, r. 111*l.* 12s., 650*l.*

MAY 21.—*Rutley, Son, & Vine* : 14, Argyle-st., King's-cross, u.t. 49 yrs., g.r. 13*l.* 15s., r. 50*l.*, 375*l.* ; 50, Baring-st., Hoxton, u.t. 41 yrs., g.r. 4*l.* 4s., r. 23*l.*, 225*l.* ; 51, Baring-st., u.t. 41 yrs., g.r. 4*l.* 4s., r. 23*l.*, 225*l.* ; 56 and 58, Marlborough-st., Paddington, 454 yrs., g.r. 12*l.*, r. 66*l.*, 635*l.* ; 37, Tachbrook-st., Pimlico, u.t. 29 yrs., g.r. 9*l.*, r. 50*l.*, 300*l.* ; a plot of f. land, Hall-rd., Peckham, 46*l.*—By *H. J. Bromley* : 1, 3, 5, and 7, Woodcote-pl., West Norwood, f., r. 78*l.*, 850*l.* ; 12, 14, and 16, Ernest-st., and a plot of land in rear, f., 860*l.* ; 101 and 103, High-st., u.t. 31 yrs., g.r. 8*l.*, r. 40*l.*, 370*l.*

MAY 22.—By *E. Christian* 227, 229, and 231, Carlton-rd., Mile End, u.t. 35 yrs., g.r. 9*l.*, r. 72*l.*, 785*l.*—By *Baker & Sons* : 50 and 54, Radipole-rd., Fulham, u.t. 87 yrs., g.r. 16*l.*, 700*l.*—By *Graves & Son* : 155 and 157, Church-st., Paddington, u.t. 43 yrs., g.r. 25*l.*, r. 76*l.* 10s., 540*l.* ; 30 and 49, Spring-st., u.t. 30 yrs., g.r. 19*l.*, r. 185*l.*, 1,075 — By *C. & H. White* : 6, Milverton-st., Kennington, u.t. 40 yrs., g.r. 4*l.* 15s , 265*l.*—By *Newbon & Co.* : 36, Bowling Green-lane, Clerkenwell, u.t. 34 yrs., g.r. 6*l.*, 205*l.* ; 111, Asylum-rd., Peckham, u.t. 65 yrs., g.r. 6*l.* 1s. 9d., r. 20*l.*, 210*l.* ; Three plots of f. land, Thornhill-rd., Leyton, 255*l.* ; 19, High-st., Hornsey, u.t. 87 yrs., g.r. 19*l.*, 245*l.* ; 87, Andover-rd., Holloway, u.t. 59 yrs., g.r. 6*l.*, 195*l.* ; 71, Marquess-rd., Canonbury, u.t. 54 yrs., g.r. 10*l.*, 550*l.* ; 84 to 92 (even), Cochrane-st., St. John's Wood, u.t. 29 yrs., g.r. 26*l.* 5s., r. 150*l.* 10s., 1,440*l.* ; 82, St. John's Wooter., u.t. 44 yrs., g.r. 5*l.*, r. 44*l.*, 445*l.* ; 11 & 15, Charles-st., u.t. 37 yrs., g.r. 12*l.*, r. 72*l.*, 630. ; 40, Barnsbury-grove, Barnsbury, f., r. 30*l.*, 390*l.* ; 1, Offord-rd., u.t. 47 yrs., g.r. 9*l.*, r. 50*l.*, 385*l.* ; 11, Mary-st., Hoxton, u.t. 36 yrs., g.r. 3*l.* 3s., r. 26*l.*, 190*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent ; l.g.r. for leasehold ground-rent ; l.g.r. for improved ground-rent ; g.r. for ground-rent ; r. for rent ; f. for freehold ; c. for copyhold ; l. for leasehold ; e.r. for estimated rental ; u.t. for unexpired term ; p.a. for per annum ; yrs. for years ; st. for street ; rd. for road ; sq. for square ; pl. for place ; ter. for terrace ; cres. for crescent ; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.		
ton	8 0/0	9 0/0
Teak, E.I.. load	8 10 0	14 0 0
Sequoia, U S ft. cu	2 3	3 0
Ash, Canada load	2 10 0	4 5 0
Birch, do.	2 5/0	4 5/0
Elm, do.	2/10 0	4/15/0
Fir, Dantzic, &c.	2/0/0	3/15/0
Oak, do.	2/10/0	4/10/0
Canada....	4 17 6	6 10 0
Pine, Canada red	2 10 0	3 10 0
Do, yellow ..	2 0 0	3 10 0
Lath, Dantzic, fath	5 0 0	6 0 0
St. Petersburg	5,0,0	7/0/0
Deals, Finland, 2nd & 1st std 100	7 15/0	10/10 0
Do, 4th & 3rd..	7 5 0	8 5 0
Do. Riga	6 5/0	7/15 0
St. Petersburg, 1st yellow ..	9 7/0	14/10 0
Do. 2nd yellow	8 5 0	9 5 0
Do. white ..	6 15 0	10 10 0
Swedish	6 15 0	15 15 0
White Sea	8 5 0	17 5 0
Canada, Pine 1st	13/0/0	21/0/0
Do. 2nd ..	9 0 0	15 10 0
Do do 3rd, &c.	8 10 0	10 0 0
Do. Spruce, 1st	8/15/0	11/0/0
Do. do. 3rd & 2nd	6/5/0	7/15/0
New Brunswick	5/0/0	7/0/0
Battens, all kinds	3/10/0	18/10/0
Flooring Boards, sq., 1 in. prep.	0/10/0	0/14/0
Do. 2nd.....	0/9 0	0/10/6
Other qualities	0 8 0	0 7 6
Cedar, Cuba ..ft.	/4	/4½
Honduras, &c.	/4	/4½
Mahogany, Cuba.	/4½	/5½
St. Domingo, cargo av	/4½	/5½
Mexican do. do	/4½	/5½
Tobasco do. do	/5½	/7
Honduras do..	/5½	/6½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio.....	10/0/0	20/0/0
Bahia	9/0/0	18/0/0

TIMBER (*continued*).		
Satin, St. Domingo .....ft.	0/0/10	0/1/3
Porto Rico	0/0/10	0/1/6
Walnut, Italian ..	0/0/3½	0/0/7
METALS.		
Iron—Bar, Welsh, in London..ton	6/5/0	6/15/0
Do. do. at works in Wales	5/15/0	6/5/0
Do. Staffordshire, in London	6 5/0	7/0 0
COPPER. British, cake and ingot	58/0/0	57/0 0
Best selected ..	59 0 0	60/0 0
Sheets, strong .	68/0 0	6 0 0
Chili, bars	52 10 0	0 0 0
YELLOW METAL	0/0 6	0 0/6½
LEAD — Pig, Spanish ....ton	12/7/6	12 8 0
English, com. brands	12/12/6	12/15 0
Sheet, English, 3 lbs. per sq. ft. and upwards ..	14/5/0	0/0/0
Pipe	14 15 0	0 0 0
ZINC — English sheet ....ton	26/5/0	0/0/0
Vieille Montagne	26/15/0	0/0/0
TIN—Straits	90/10/0	0/0/0
Australian	90/15/0	0/0/0
English Ingots	94/10/0	0/0/0
OILS.		
Linseed .....ton	22/5/0	22/10/0
Cocoanut, Cochin	35 0/0	0/0/0
Do. Ceylon	29/10/0	0/0/0
Palm, Lagos	26/0/0	0/0/0
Rapeseed, English pale	31/0/0	0/0/0
Do. brown	28/5/0	29 10 0
Cottonseed ref..	21,10/0	22 0 0
Oleine	21/15/0	24/0/0
Lubricating, U.S.	6/0/0	7/0/0
Do. refined	7/10/0	12/0/0
TAR — Stockholm barrel	1/0/0	0/0/0
Archangel	0/13/6	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BAILDON (Yorks).—For the construction of a storage reservoir in Micklethwaite-with-Bingley, for the Local Board. Mr. B. Walker, Engineer, The Exchange, Bradford, Yorks. Quantities by Engineer :

J. & T. Young, Armley, Leeds*	£12,920 10 0

* Accepted on reduced quantities.

BEXHILL ON SEA (Sussex).—For the erection of small villa residence, Buckhurst-road, Bexhill, for Mr. H. P. Hutchings. Mr. Julian Downsborough, architect, Bexhill-on-Sea. Quantities by the architect :—

S. Barker	£780	0	0	Hy. Parker	£684	0	0
P. Jenkins	775	0	0	Johnson & Co.	637	0	0
W. Austin	761	1	9	Hy. T. Smith, Bexhill-on-Sea(accepted)	623	0	0
J. King	729	0	0				
C. Errey	690	0	0				

EALING.—For alterations and additions, new billiard-room, &c., the "Queen Victoria" Hotel, Ealing-green, for Mr. Sidney J. Street. Mr. Walter Mitchell, architect :—

Spencer & Co.	£1,620			T. Nye, Ealing*	£1,498
J. Vears & Co.	1,557				

* Accepted.

FENTON (Staffs).—For detached house, Blurton-road, Fenton, for Mr. P. Wagstaffe. Mr. Thos. Tindal, architect, Longton :—

H. & R. Baskip	£893	0		Thos. Bromage	£708	0
Minks	850	0		Tompkinson & Bettelley, Longton (accepted) .	730	0
P. H. Beardmore	798	0				
H. Goodwin	736	16				

FOREST GATE.—For constructing proposed swimming-baths at Woodgrange House, Forest Gate, for Mr. Francis Craddock Mr. C. J. C. Pawley, architect, 2, Prince's-mansions, Victoria-street S.W :—

J. Mansbridge	£3,050	Everitt & Co.	£2,900
W. Goodwin	2,900	Turtle & Appleton	2,800

FREEMANTLE.—For the erection of mission hall, for the Rector and Churchwardens of Christ Church, Freemantle. Mr. Sydney K. Pope, architect, 27, Portland-street, Southampton :—

J. Crook & Son	£316	0	T. J. Jukes, Park-road, Freemantle (accepted)..
A. Warden	312	0	£305

HASTINGS.—For erecting new workhouse, St. Helen's Down, Hastings, for the Board of Guardians. Mr. Philip H. Tree, architect, St. Leonards-on Sea. Quantities supplied:—

T. Simmonds	£98,891	H Steffe	£85,798
Reed, Blight, & Co.	90,550	Longley & Son	84,985
F. & H. Higgs	90,000	Morgan, Isted, & Co.	83,986
S & W. Pattinson	87,455	W. & F Denne	83,750
Martin, Wells, & Co.	84,000	F. Cruttenden	82,780
F Peters	89,000	T Salter	82,500
W. Martin	88,700	Wallis & Sons	82,250
H. L. Holloway	88,000	Taylor Bros.	81,000
Kirk & Randle	86,983	F. Jenkins	79,500
W. J. Adcock	86,777	Holloway Bros.	79,041
Patman & Fotheringham	86,500	Eldridge & Cruttenden	78,850
Denne & Son	85,940	Architect's estimate,	£85,000.

HAYNFORD (Norfolk).—For alterations and repairs to Haynford Hall, near Norwich, for Admiral E. Pollard. Messrs. Ayres & Ardron, architects, 8, Southampton-street, Bloomsbury-square, W.C.:—

Watts	£1,293	Baldwin, Horstead	£880
Chapman	1,211		

* Accepted, subject to reductions.

HEREFORD.—For the construction of pipe sewers, with manholes, &c., for the Town Council. Mr. John Parker, City Surveyor, Municipal-house, Hereford:—
John Macaay, Hereford (accepted at a schedule of prices).

KIRKCALDY, N.B.—For additional waterworks at Harperlees, near Leslie, for the Kirkcaldy and Dysart Water Commissioners, Mr. W. D. Sang, Engineer, Kirkcaldy, N.B.

John Morris & Sons	£1,700 16 1½	John Kennedy	£1,186 18 6
R. C. Brebner	1,305 14 3	Alex Brunton & Son, Kirkcaldy	
David Whyte	1,236 19 4½		
William Wilson	1,203 0 9	ing (accepted)	972 3 6½
George Smith	1,221 6 04	L. & W. McDonald	906 16 3½

LEEK.—For sewering, excavating, levelling, metalling, kerbing, flagging, &c., Belle Vue-road, Leek, for the Town Commissioners, Mr. John Myatt, Town Surveyor:—
Fred. Barke ..... £798 | Thos. Grace, Leek (accepted) £920

LINCOLN.—For the erection of stable and cart shed, Pelham-street, for Messrs. Arnold & Co. Mr. J. H. Cooper, architect, Lincoln:—

Wright & Sons	£195 0 0	W. S. & W. Close	£184 0 0
S. Horton	193 7 6	M. Otter & Co.	179 0 0
J. B Harrison	191 13 0	J. W. Harrison*	157 0 0
C. Morgan	185 0 0	* Accepted.	

LINCOLN.—For additions and alterations to branch premises (exclusive of iron girders), at Metheringham, for the Lincoln Co-operative Society. Mr. J. H. Cooper, architect Lincoln:

M. Broughton	£297 0 0	M Otter & Co.	£220 0 0
T. Hulkes	247 15 6	J. W. Harrison*	210 0 0
	* Accepted.		

LONDON.—For alterations and additions to the "Red Lion" public-house, Horton, for Mr. E J. Arpthorp. Mr. E E Niblett, architect, 11, Union-chambers, Worinwood-street, E C

Walker Bros.	£2,226	Burman & Son	£2,069
Courtney & Fairbairn	2,180	G. E. Todd (accepted)	2,010
W. & L. Ransom	2,095	W. Evans	2,000

LONDON.—For alterations and additions to the "Rose and Crown" public-house, Southwark Park road, S E, for Mr. Morris Hart. Mr. E. E. Niblett, architect, 11, Union-chambers, Wormwood-street, E.C.:

W. Higgs	£1,695	Courtney & Fairbairn	£1,513
W. Evans	1,585	Turtle & Appleton*	1,384
Walker Bros.	1,580	* Accepted.	

LONDON.—For painting and repairs at the Infirmary, Basinghall-street, Old Gravel lane, E., for the Guardians of St. George-in-the-East. Messrs. Wilson Sch. & Aldwinckle, architects, 2, East Indiaavenue, Leadenhall-street, E.C. Quantities supplied:

Turtle & Appleton	£520 0 0	J. Holland	£393 0 0
C. Willson	844 0 0	G. E Todd (accepted)	836 0 0
Staines & Son	796 0 0	M. McCarthy	653 17 9
G. Barker	795 0 0		

LONDON.—For painting, decorating, &c., at the Infirmary Wing, St. Pancras, for the Guardians:—

Puckett	£238 0	Furness	£235 0
White & Son	345 10	Derby	197 0
Nye	276 0	Lane	196 0
Marchant	249 0	Rowe Bros.	180 0

LONDON.—For alterations at the "Two Brewers," Westminster, for Mr. Walters Mr. H. W. Budd, surveyor, 76, Vincent square, S.W.:—

Prestige & Co.	£480	Charteris	£400
Turtle & Appleton	478	Masters*	397
Lamble	435	* Accepted.	

LONDON —Accepted for fittings and alterations to No. 75, Fleet-street, E.C., for Messrs. Lockharts, under the superintendence of Mr. Henry Cook:—
Fredk. Britton, Leconfield Works, Highbury, N. £653 18 6

LONDON.—For the repair, cleansing, and painting of the following schools, for the West Ham School Board. Messrs J. T. Newman & Jacques, 2, Fen-court, E.C., Architects to the Board:—

Colegrave-road Schools.

Sharpe	£395	Norton & Son	£303
North	339	Reed	299
Morter	310	Catley (accepted)	280

Custom House Schools.

Goodchild	£242	Whitty	£225
Morter	240	Humphreys*	208
Maddison	231	* Accepted.	

High-street Schools

Allen & Clemenson	£190	Whitty	£152
Norton & Son	189	Bishop & Webb	151
Reed	185	Humphreys (accepted)	108

Maryland Point Schools.

Sharpe	£505	Norton & Son	£295
Catley	310	Morter	294
Hosking	297	Reed (accepted)	289

Regent's-lane Schools.

Hearle, Farrow, & Co.	£394	Key	£260
Bishop & Webb	384	Noakes*	245
Maddison	379	* Accepted.	

Cleansing Latrines at Schools.

Bishop & Webb	£169	Noakes	£120
Maddison	131	North Bros.*	104
Hosking	124	* Accepted.	

LONDON.—For the erection of new quarters for married police officers, at South Fulham Police-station, for the Receiver for the Metropolitan Police District. Mr. John Butler, F.R.I.B.A., Architect. Quantities by Mr. W. H. Thurgood:—

Hart Bros.	£3,536	Stimpson & Co.	£3,160
Grover & Son	3,313	Scrivener & Co.	3,100
J. T. Chappell	3,310	C. Ansell	3,090
Garlick & Horton	3,300	E. Nightingale	3,073
J. Smith & Son	3,297	H. Smith & Son (withdrawn owing to mistake in cost)	2,935
Lathey Bros.	3,176		

LONDON.—For the demolition of existing courts and cottages, the formation of a new street, and the erection of eleven blocks of tenement houses on the London Hospital Estate, for the Governors. Messrs. J. T. Newman & Jacques, architects, 2, Fen-court, E.C. Quantities by Messrs. R. L. Curtis & Sons:—

Sharpe	£16,900	Sparks	£15,890
Hearle, Farrow, & Co.	16,396	Morter	15,843
Reed	16,290	Harris & Wardrop	15,700
Nightingale	16,270	Perry & Co.	15,595
Holland	16,047	Stimpson & Co.	14,960
Outhwaite & Son	15,980		

LONDON.—For alterations at the "Red Lion" Rotherhithe, for Mr. Karslake. Mr. H. W. Budd, 76, Vincent-square, S.W.:—

Charteris	£410	Smithers*	£335
Prestige & Co.	374	Masters	315

* Accepted at reduced amount.

LONDON.—For the erection of an ink factory, Finsbury Park, N., for Mr. H. C. Stephens, M.P. Messrs. Cricksmay & Sons, architects, 17, Parliament-street, Westminster, S.W.:—

Patman & Fotheringham	£26,850	J. Mowlem & Co.	£25,008
Dove Bros.	25,775	Holland & Hannen	24,895
Smith & Co.	25,374	G. H. & A. Bywaters	24,860
Colls & Sons	25,115	E Lawrance & Sons	23,561

LONDON.—For the erection of mortuary, &c., for the Vestry of Bermondsey. Mr. G. Elkington, architect:

Orfeur	£390 0	Chalkley	£187 0
Courtley & Fairbairn	339 0	Kingsman	156 17
C. Pennack	321 0	W. F. Russ (accepted)	138 0

LONDON —For the erection of four houses, Albert-grove, Morpeth-road, Victoria Park, for Mr. Fox. Messrs. T. & W. Stone, architects, Great Winchester-street, London wall, E.C. —

Laughton	£1,690	G. W. Beale	£1,279
Jarvis & Sons	1,539	Winkley	1,058
F. G. Higgs	1,297	J. Peppiat	980
B. Wire	1,268		

LONDON.—For building workshops at rear of 51, Tudor-street, Hackney, E., for Messrs. Spratt Bros.:—

Royal & Co.	£2,280	Thomerson & Son	£1,744
Boyce	2,235	Jarvis & Son.	1,420
Mower & Son	2,137		

LONDON —For alterations, &c., at the "Spread Eagle" public house, Grosvenor road, Pimlico, for Mr. J. Bott:—
Mower & Son (accepted) £317 0 0
[No competition.]

LONDON.—For alterations, &c., at the "George" public-house, Commercial-road, for Messrs. Poole & Venner. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street:—

Voller	£2,849	Spencer & Co.	£2,370
Mower & Son	2,497	Harriss & Wardrop	2,333
Todd	2,489	Walker Bros.	2,330

LONDON.—For alterations, &c., to the "Queen's Railway Hotel," Chilworth street, Paddington, W., for Messrs Speedy & Co. Mr. H. L. Newton, architect, 49, Victoria-street, Westminster, S.W.:—

Patman & Fotheringham	£2,170	F. Mark	£1,999
S. Godden	2,100	C. Dearing & Son, Islington*	1,750
H. Burman & Sons	2,080		
S. R. Lamble	2,074	* Accepted.	

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W. Helling, Oxford-street (accepted) £62

LONGTON (Staffs.).—For two semi-detached houses, Rosslyn road, Longton, for Messrs. Cope & Harber. Mr. Thos Tindal, architect, Longton:—

P. H. Bennion	£379	0	0
H. & R. Inskip, Longton (accepted)	325	0	0

NORTHWOOD (Middlesex).—For the first of three houses, for Mr. George J. Elgood. Mr. Frank M. Elgood, architect, 98, Wimpole-street, W. Quantities by Mr. Ernest S. Gale, Falcon-court, 32, Fleet-street, E.C.:—

Maskins	£836	T. Turner & Co.	£779
Waterman	846	Wm. Thompson, Pinner*	762
McSwinney	845	*Accepted.	

SOUTHEND.—Accepted for fittings and alterations to No. 10, High-street, Southend, Essex, for Messrs. Lockharts, under the superintendence of Mr. Henry Cook:—
Fredk. Britton, Leconfield Works, Highbury, N. £762 5 0

SURBITON.—For painting and repairs at Norbury House, Surbiton, for Miss Forster. Mr. Walter J. Ebbetts, architect, Savoy House, 115, Strand, W.C.
H Baylis (accepted) £113 10 0

TENTERDEN (Kent).—For alterations to kennels, and erection of two loose boxes at Heronden Hall, for Mr. Dampier Palmer, J.P. Messrs. J. T. Newman & Jacques, architects, 2, Fen-court, E.C.:—

Weeks & Co.	£167 10	Nunn	£163 10
Woodgate	161 0	* Accepted	

WEST HAM.—For main drainage extension works: Contract No. 17. Construction of an engine-house, and alterations to the existing pump-wells, &c., at the Corporation Sewage Works, Canning Town, Bow Creek. Mr. Lewis Angell, M.Inst.C.E., Borough Engineer, Town Hall, Stratford, London, E

J. Neave	£2,979 0 0	W. J. Maddison	£2,105 0 0
A. Ansell	2,749 0 0	R. Cooke & Co.	2,095 4 10
A. Beeton	2,346 0 0	J. Jackson, Plaistow*	2,000 0 0
	* Accepted.		

WIMBLEDON.—For additions and alterations to the Wimbledon Sanitary Laundry, Cranbrook-road, Worple-road, Wimbledon. Mr. Walter J. Ebbette, architect, Savoy House, 115, Strand, W.C.:—
H Harmer (accepted) £774 16 6

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The Builder.

VOL. LX. No. 2302. SATURDAY, JUNE 6, 1891.

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The International Congress of Hygiene.

IN spite of the rather inconvenient time of year (according to London habitudes) which has been selected for it, the seventh International Congress of Hygiene and Demography to be held in August, and of which we give the programme (as far as settled) in another column, will probably be an important and successful "function." The Prince of Wales is the President of the Congress, and, from the conscientious manner in which he always fulfils engagements of this kind, there is no doubt that he will arrange to be present during a portion if not the whole of the Congress week, a consideration which will draw to town many excellent persons who would under any other circumstances consider it either vulgar or "a bore" to be in London in August. They will not contribute much to the discussions, but they will supply listeners and subscribers, without which no Congress can be a practical success. The situation of the buildings in which the meetings are to take place is central enough, though it is to be regretted that it was impossible to find a single building to accommodate all the sectional meetings; the necessity of wandering from one building to another too often delays the progress of the meetings and keeps an audience away which has got into one building and does not care to quit it for another. The rooms of the learned societies and of the University of London are in very close contiguity certainly, but the School of Mines in Jermyn-street, to which Demography is relegated, is rather an isolated situation for so important a section of the Congress.

"What is demography?" is a question which has been asked already, and will probably be asked very often during or before the Congress. The word implies the study of the conditions and tendencies of societies and peoples taken at large, by means of that potent modern weapon of investigation, statistics, the great power of which lies in the fact that it is an agglomeration of facts and not of opinions, and therefore as far as it goes is a means of getting at the truth without the bias given by individual feeling. One form of demography is to be found in the map-records or graphic representation of disease statistics which have been used to some extent in this country in tracing the relation of disease to surrounding conditions, and which were illustrated in the remarkable collection of maps of density and kind of population, prevalence of various diseases, &c., over the area of Paris, exhibited in the Ville de Paris pavilion of the 1889 exhibition. In the words of the programme of the Congress, "demography deals with the conditions of communities from the statistical point of view." The importance of this study of the condition of life *en masse*, the special insight which it may afford into the relation between occupations, climate, hours of work, &c., and the health and well-being of man, must be apparent to every one on very little consideration. We may have one example of a man who attributes depreciation of bodily health, or premature old age, to the nature and conditions of his occupation, or to the state or situation of the town or the street he lives in. But we can hardly base any conclusions on an isolated case. It may be quite clear that the man has suffered from the nature of his occupation, but it may also be that his constitution was defective in some way which rendered him peculiarly liable to a deteriorating influence from the circumstances under which he lived. But take the statistics of the health and longevity of five hundred, of a thousand, of fifty thousand men pursuing the same occupation or inhabiting the same town, and the answer is a much more decisive one: in fact it is one of the most decisive we can get. Statistics tend in their very nature, when scientifically collected, to balance each other's mistakes, to make up a sum total which represents the true condition of things within a comparatively narrow margin. A certain number of men per thousand who are engaged in a certain trade die of consumption; and if the proportion is largely in excess of the proportion of deaths from consumption in the total population, the unhealthy nature of that occupation, or of the conditions under which it is carried out, is an ascertained fact, as well as the direction in which it is unhealthy, and the duty is morally imposed, both on employers and employed, of ameliorating or removing the unhealthy influence. It will be readily recognised how far-reaching is the bearing of this class of statistics on the numerous trades connected with building and construction and manufacture. This is the subject of the very first paper in the provisional programme of the Demography Section of the Congress, to be read on Tuesday, August 11: "Disease and Mortality in reference to Occupation." The vast importance of such a subject, alike to labouring men and professional men, can hardly be over-rated. It is not well, of course, to be mentally sensitive and over-anxious about the results on our lives of the nature and conditions of our occupation: that kind of sensitiveness as often as not predisposes people to the very ailment they are nervously anxious to avoid. But the discovery that the members of a profession or trade we are obliged to follow have a life average distinctly below the general life average ought certainly to lead to a reasonable consideration as to what are the circumstances connected with the occupation which tend to shorten life, and how far they are removable. It is contemptible indeed to be always under fear of death, and it is sometimes the higher course to endanger or sacrifice life than to think about saving it; as Frederick the Great said to some of his soldiers when they were afraid of going under fire in an important attack—"Dogs! would ye live for ever?" But this principle can seldom apply to the continuous occupations of peaceful life; it is the duty of men to the world and to their families, as well as to themselves, to avoid preventable causes which tend to shorten life; and probably such causes exist in the ordinary routine of many occupations, and in a preventible form too, which are quite unsuspected by the persons carrying on those occupations, who would be very glad to try to improve their chances of life if the way were pointed out to them. On this subject the Demography department of the Congress may throw a great deal of light, may stir us up to combat against dangers, to others as well as to ourselves, which we had hardly suspected; and certainly we shall expect to find the meeting



Bas-relief in the New Gallery. By Mr. E. Roscoe Mullins.

for the consideration of that subject largely attended. The subject comes home to nearly all of us.

In the branch of "Architecture in Relation to Hygiene" (Section VI.) the programme is comprehensive enough and laid out in a very logical manner. The general question of the laying out of towns occupies one main section, that of buildings forms the second. Under the first section are to be considered the subject of the reservation of open spaces, of such vast importance in a town like London, and of the alignment of streets and roads, the height of buildings, frontages, &c. It is to be hoped that in discussing these subjects some contributor will take a strong line in regard to the desirability of considering architectural effect and vista in laying out streets, so much neglected in London, and the necessity of regulating heights in reference to the width of the streets. In view of the present desire to build high, which the increasing use of lifts has rendered practicable, it should be borne in mind in planning new streets that this modern practice in building must be taken into consideration, and that widths formerly thought amply sufficient, and which may still be sufficient for traffic, will not be sufficient in the future, either in an architectural or a hygienic sense, under these new conditions of building. Northumberland Avenue is a standing instance of this. Under the second main heading of Section VI. almost every question in connexion with the practical side of building might be included, and it will probably need a strong hand on the part of the Managing Committee to keep this part of the proceedings within practical compass. The subject which seems most likely to excite special interest is that of "Dwellings partly or wholly used in common," as this includes the now much-vexed question as to the desirability of erecting large blocks of "model" dwellings, as to the sanitary advisability of which the medical profession has shown itself very much in opposition of late.

Section VII., "Engineering in relation to Hygiene," has a less complicated programme than the architectural section, though not in one sense a less comprehensive one, for it proposes to deal with four subjects of the highest and most vital importance to the health of towns, viz.: Sewage and Sewage disposal, Water Supply, Pollution of Rivers, and Town Refuse. The second question, that of water supply, could nowhere be more appropriately discussed at the present moment than in London, and the Congress of Hygiene will have justified itself fully to Londoners if it can only leave behind it any thoroughly adequate and practical suggestion for meeting the future water requirements of London.

The languages to be recognised at the Congress are English, French, and German, and abstracts of papers, we believe, will be supplied in those three languages. Such abstracts, not to exceed 500 words, and typewritten (to ensure correctness in printing), are to be sent to the secretaries of departments not later than June 15, and the full papers not later than July 15. The time for each paper is to be limited to fifteen minutes, and that for speakers in the discussions to ten minutes. Unless these arrangements are strictly insisted upon by the chairmen of sections, it will be impossible to get through the work, and it is to be hoped that the various presidents will recognise the imperative necessity of keeping a rigid discipline in this respect.

The remainder of the subjects to be discussed in other sections are mostly of a medical character and do not come within our special province. We observe however that in the chemical section the subject of "Town Fogs and their Effects including Smoke Prevention" is to form the first day's programme, a subject which is of interest to people of all occupations who live and work in London. Under the section of State Hygiene there are also included the sanitary registration of houses and the housing of the poorer classes; but under this section we may presume that the discussion will turn not so much upon the details of sanitation and housing as upon the principle on which, and the extent to which, the State can interfere.

There appears to be a shadowing forth of a very large programme of amusements and visits in addition to the more serious work of the sections, and altogether the week seems likely to be a remarkably full one,

"A crowded hour of glorious life,"

which will be a pretty fair tax on the energies of those who take part in it, taking the business and the pleasure together.

SCULPTURE AT THE ROYAL ACADEMY AND NEW GALLERY.

THE Royal Academy exhibits include this year no work of the first importance among the new designs. The two most prominent works, Sir F. Leighton's "Athlete" and Mr. Harry Bates's "Hounds in Leash," have already appeared there in other materials, and the present works are therefore only replicas, the "Athlete" a marble version of what has formerly been exhibited in bronze, the other the bronze casting of the design formerly exhibited in plaster. Of this latter work we give an illustration in the present number. It is a work giving a very powerful expression of strenuous action in sculpture; the dogs are splendid creatures, almost colossal in power and proportions; so much so indeed that the group suggests a doubt whether one man, braced as his figure is into the strongest position for throwing both his weight and his strength against the pull of the animals, could possibly hold them in. The group is very finely composed, however, and is one of the most vigorous works of modern English sculpture. Sir F. Leighton's "Athlete" is too well-known to need description; on the whole the design is perhaps better suited to bronze than to marble, but it was quite worth reproducing in another material.

Of the works placed in the central area of the lecture-room we give illustrations of two, both by Mr. Brock; "The Genius of Poetry," and "Song." Both are of course well modelled figures; neither appears to us to be very successful in realising the proposed subject. The Genius of Poetry is a rather Byronic and theatrical genius, self-conscious in his attitude. "Song" is perhaps not a subject very suitable for treatment as a nude figure. A singer not engaged in combining acting with singing (which is evidently not intended here), would naturally plant both feet firmly on the ground while singing; the whole body is concerned in the effort, and no singer would be likely to stand on one foot with the other leg loosely bent. But this firm position is of course not so pleasing from a sculpturesque point of view, and hence is naturally avoided by the sculptor in a nude figure. The figure is a pretty one, but she is not pouring much either of mental or physical effort into her song. Mr. Boscombe John's "Morpheus" is apparently to some extent suggested by Sir F. Leighton's "Sluggard;" it is a realistic and rather thin and poor nude figure of a man, putting his hands up to his head in a sleepy attitude. There is a good deal of character about the head, which is the best part of the work. Mr. Frampton's "A Caprice" we cannot care for at all, a slippered young woman standing on tiptoe and brandishing some rushes in her hand; the legs seem rather too long, and the whole thing is somewhat sensational without having any definite point or meaning. Mr. Nelson Maclean's "Fountain and Statuette" is a prettily designed fountain basin on a pedestal, with a small draped figure rising from the middle of the basin, also rather deficient in special character.

The centre of the octagon-room is occupied by another model for a fountain in terra-cotta, by Mr. G. W. Wilson: a sufficiently decorative piece of work in Renaissance style, with three terminal nymphs, whose terminals end below in lions' claws, supporting the basin. The general design of the whole is graceful, though it is only an imitation of well-used Renaissance *motifs*. On the wall of the octagon is one of the best works of the year, Mr. Stirling Lee's "Kiss of Dawn," a life-size bas-relief enclosed in a large circular

medallion-like frame. The subject is a mother with her infants, grouped so as to fill up about three-fourths of the circle, while the half-length figure of "Dawn," in very low relief and seeming to grow out of the background of the panel, kisses her on the forehead. The work is poetic in idea and sculpturesque in treatment. Mr. Simonds's colossal statue of "The late Hon. Frederick of Tollemache," to be erected at Grantham, seems rather weak-kneed, both legs more or less bent and the figure slightly stooping forward; if this is intended as conveying an actual physical characteristic in a feeble or aged man it is comprehensible, though its effect in a portrait statue is rather unhappy; if it is not so intended, it seems to be an oversight in the posing of the statue. The treatment of the long cloak introduced is broad and effective. Mr. Adrian Jones exhibits a spirited model for a victory and quadriga in bronze, which it would be worth while for the Office of Works to consider as a possible finial to the Constitution Hill arch, which was always intended to have such a group on it. Among the other work in the octagon-room Mr. F. W. Pomeroy's "Nymph Finding the Head of Orpheus" is noticeable not only as a graceful life-size figure but for the expression conveyed in the face, which removes it from the rank of mere classical commonplaces. There are two essays in the treatment of everyday subjects of modern life, Mr. Creswick's "Young Footballer," a school-boy in knickerbockers and flannels holding a football, a spirited figure, but with the head surely rather too small; and Mr. Atkinson's "By the Wayside," a seated figure (bronze) of a country peasant or tramp; well realised, but a subject out of place in sculpture. Mr. Toft's "A Little Student" is an excellent miniature nude study of a boy reading, the head showing a great deal of character and expression.

Returning to the Lecture-room, we find among the works arranged round the walls Mr. Thornycroft's beautiful piece of decorative bas-relief "Science," of which an illustration is given in the present number. This is the model of an internal frieze to be carved in the Institute of Chartered Accountants in the City of London. The sculptor has given the figures sufficient similitude to secure the effect of repose and continuity, while giving them a certain slight variety of pose and expression, just enough to give them individual interest. They appear, from their attributes, to represent Chemistry, Electricity, Mechanics, and Mensuration. Near this is Mr. Simonds's small decorative panel in copper, low relief, for a mantel-piece, "The Four Seasons," represented by four figures standing under the compartments of an arcade indicated also in very low relief. Beneath Mr. Thornycroft's frieze is a glass case containing two little pieces of metal work by Mr. Alfred Gilbert, a silver statuette of "Victory," and a working model for a jewel to be executed in silver gilt and gold for the Institute of Painters in Water-colours. This last is a remarkable little invention. A small nude figure stands in the centre on a delicate shell, while behind her is a background of branching gold work; she holds in one hand a tiny mirror, in the other a pearl; the mirror is probably intended to be filled with a diamond; other precious stones are worked into the design at suitable points. This is a most charming and original bit of work, quite in the spirit of Florentine Renaissance though not directly imitating its forms. On the opposite side of the room is Mr. Pegram's life-size group "Sibylla Fatidiea," which is the old legend of the witch looking for the fortune of a young woman in a crystal ball, the object of the inquiry being required to strip herself of her clothes; Mr. Poynter made the legend the subject of his diploma picture some years ago. In Mr. Pegram's treatment the witch, an old but not decrepid-looking woman, sits with a hood over her head throwing a shadow on the features, and looking straight before her at the crystal ball held in her hand; the young woman is bowed down with her head over the witch's knees. This nude figure, in a difficult attitude, is finely modelled, and the whole group is powerful and original though not beautiful; an old woman is not an attractive object in sculpture, and the attitude of the other figure is rather constrained; a work to be looked at with admiration rather than enjoyment. We shall be able to give an illustration of it on another occasion. Mr. Mullins's "Love's Token," of which we give an illustration, is a statuette of very graceful design and expression. Miss Ellen Rope's small medallion, "Boy on Dolphin," is a charming bit of sculpturesque fancy, of which also we will give an illustration in another number; we give here meanwhile her little figure of Zephyrus as a child blowing a trumpet, and



"Zephyrus"; by Miss E. M. Rope.
(In the Royal Academy.)

also call attention to her pretty series of little bas-reliefs in which the four seasons are represented by figures of children. Miss E. Halse contributes a series of child studies of another kind, a set of little studies from life in wax, in high relief; these we shall be able to illustrate in another number, they are very charming and very real studies of the action and manner of a year-old child.

Among the busts are the usual number of uninteresting portraits, and a few to which some special interest is given by the beauty of the work or the manner of its treatment Among those which are simply good portraits, modelled with force and truth, may be named Miss Halse's of Mr. G. Halse; Mr. Pinker's of the late J. D. Sedding, an admirable likeness; and Mr. Birch's of Mr. Stanley. Mr. Brock's "Lady Gwendolen Ramsden" is peculiarly treated and effective; it is a bas-relief, the head treated in the flat manner of bas-relief, but the profile undercut so as to stand out against a dark shadow outlining it. Mr. Onslow Ford's portrait of "Frederica, daughter of S. Pepys Cockerell" is a silvered-bronze bust on a decoratively-treated base with some enamel colour. Mr. Lucchesi's bust, "A Sorceress," is a fine and effective bronze head, with a small winged lizard or serpent on the head, and a bat beneath, all modelled with great spirit. Miss Kate Tizard's "Hypnos," a winged head representing sleep, is a good work. Mr. Armstead exhibits a bust portrait of Miss Hester Armstead, and Mr. Stirling Lee a bas-relief portrait in bronze in that very low relief for which he partly gave the suggestion, in which the profile seems hardly detached from the ground, giving almost a pictorial effect. This kind of treatment is very delicate and very decorative in effect. "A Study," by Mr. Onslow Ford, is one of the most charming busts in the Exhibition, it is a white marble head of great tenderness of expression, drooped a little to one side, finished with great care; the white marble is cut off about the middle of the bust and reposes on a pedestal of delicately-marked green marble, the whole making a very beautiful work both in expression and effect.

Sculpture is not very largely represented at the New Gallery, and the honours go to Mr. Roscoe Mullins for his small but beautiful and suggestive triptych, "To Know—To Be—To Do," an engraving of which is appended. His group in the round of two chubby little children "Asleep" is also very good, and he has illustrated "We are Seven" by a pretty child's head in terra-cotta with small bas-reliefs on the base referring to the subject of the poem. Mr. Swynnerton's "A Pastoral" is a nude group of a youth and maiden, he playing a pipe; his position is rather angular and ungraceful, the figure of the girl very pretty; the group is backed by a rather too realistic hedge. Besides, we may mention Mr. Dressler's very good portrait bust of Mr. M. H. Spielman and Mr. Harry Dixon's small animal studies in bronze, a grizzly bear and a lioness and cub. The Countess Feodora Gleichen's "Queen's Cup" and "Onyx and Silver Christening Cup" are better modelled than designed; the various features of the design do not seem to blend sufficiently into a whole. The New Gallery should make an effort to attract a little more high-class sculpture; the collection is hardly worthy of the repute of the exhibition.

NOTES.

THE International Art Exhibition at Berlin has now had its first month, and has so far proved a great success in every direction. Its attraction of provincial people is already felt in Berlin, the number of visitors to the city being far above the average, and the number of persons daily passing the turnstiles of the Exhibition grounds being beyond all expectation. The portions of the walls still vacant on the opening day are now nearly all filled up; in fact, a slight overcrowding is already making itself felt in places. Among the gaps, the English one in the Architectural Division, which was a prominent one when our report on the Exhibition went to press, is being filled up this week. It is with great pleasure that we notice that the set of British drawings will be the only one which fairly represents the architectural work of a country. When ready there will be but some seventy drawings, but in these nearly every kind of public or private work will be typically represented. Among the exhibitors are our first architects, headed by Messrs. Waterhouse, Norman Shaw, Pearson, Blomfield, and Ernest George & Peto. There is a great scarcity of plans, however, scarcely a dozen miniature ones being visible. The catalogue to the Exhibition, so incomplete and wretchedly edited in the first week, has now seen several new editions, and is gradually improving, this improvement so far, however, not yet bringing it up to the normal status of a catalogue. We hear that a new critical catalogue is to be published for the exhibition, a number of art-critics being engaged in getting it up, with Dr. Gallaud as editor. The grand jury has now been elected, and has commenced its laborious task. Thirty-one is the number of members elected, of whom sixteen are German and fifteen non-German. Berlin heads the list of members with three painters, two sculptors, an etcher, and an architect, Messrs. Karl Becker, Ernst Hildebrandt, Rud. Knaus, Rud. Siemering, Hans Meyer, and Fritz Wolff; Munich is respresented by two painters, a sculptor, and an architect; Düsseldorf has two painters on the jury, and the cities of Dresden, Karlsruhe, and Weimar, one each. Of non-German members there is the painter La Chaise for America, the painter De Vriendt and the sculptor De Vigne for Belgium, the painter Karl Locher for Denmark; England has Alma Tadema, Alfred Gilbert, and a deputy, G. Eilers; Italy has Albert Hertel; Austria, Eugen Felix and

the architect Franz Roth; for Scandinavia and Switzerland, A. Norman as deputy; and for Spain, A. von Werner, Rheinhold Begas, and F. Possart; whilst Hungary has G. Kéléti. Anton von Werner has been elected president of the jury, Karl Becker and Alma Tadema acting as vice-presidents, and Hans Meyer and Felix Possart as honorary secretaries.

THE division of the Labour Commission into three distinct bodies shows very clearly the great size of the work to be done. It shows also that a great mass of useful information is certain to be gathered up, but it also shows that any immediate report or any legislation consequent upon a final or an interim report is not yet within measurable distance. The great objection to the division of the work of the Commission in the above-stated manner is that the influence of the chairman cannot be felt in the same manner as if the meetings were held by one complete body. On the other hand, it must be admitted that the size of the subject rendered it impossible for one body to do the work without sub-divisions. Whether, again, the appointment of separate commissions might not have been better, is also a matter of doubt. But that is a thing which cannot now be done.

IT is well known that competition in the iron trade is extremely keen, but it would hardly have been supposed that such a small difference in freight as one-tenth of a penny per ton per mile would prejudice iron merchants to such an extent as to seriously affect their position in the market. Yet the Railway and Canal Commissioners have just been called upon to decide a case in which one firm has been charged 1·05d. per ton per mile, while competitors situated eleven miles further off are only charged ·95d.,—the contention being that an undue preference has thus been created which injuriously affects applicants in the Staffordshire markets. Although upon this basis the rate charged to the aggrieved party is *less* than that paid by their competitors, they invoked the interference of the Court with a view of removing the inequality in the mileage rate. On the face of it, it does not appear at all probable that this difference would cause the complainants to lose any contracts, although it is clear that they would not reap quite so much advantage from their transactions as they would under a lower carriage rate; and the real question at issue was the extent to which railway companies are justified in depriving traders of the advantage of "geographical position." That the London and North-Western Railway Company,—the defendants in the action under notice,—regarded the case as one of considerable importance, may be assumed from the fact that the Attorney-General was retained for the defence, Mr. Cripps, Q.C., also appearing on the same side. Their Manager stated that in the event of an order being made to remove the inequality, they would be compelled to raise the rate charged to the applicants' competitors, and that this course would deprive the London and North-Western Company of the power of competing with the Midland Railway Company for the traffic. The Commissioners attached such weight to this argument that they declined to make the decision, and their decision will thus furnish a good precedent for the railway companies in future actions of this nature. The interests of the company would undoubtedly have suffered to an extent out of proportion to the relief which would have been afforded to the complainants; while the difference in treatment could hardly be considered oppressive, and was only made under the necessity arising from the circumstances of the competition existing between the railway companies. On another point which arose out of the same action, the plaintiffs succeeded, it being proved that the company allowed their competitors a rebate which was not disclosed in the rate-book, and which Mr. Justice Wills characterised as "undue preference of a most transparent kind." The company will have to make the applicants a corresponding allowance upon all past traffic sent by them, and pay the costs of this part of the action.

IT is to be hoped that the debate on the Ordnance Survey of the United Kingdom will bear some fruit, and that steps will be taken to hasten its completion. There should long ago have been a complete series of maps, which should be re-issued with necessary alterations at stated periods, the dates in all cases being stamped upon the maps. The *Times*, in its comment on the recent debate, expresses surprise that the Tory party, containing, as it does, so many country gentlemen, has not taken up this question. This is very ingenuous. Nearly every large landed proprietor has a scale plan of his estate, and is, thus, to a considerable extent, independent of any Government map. It is local authorities, builders, contractors, and such like, who require an authoritative Government survey up to date and easily obtainable. Mr. Roby, who has taken up the question, is not the man to let it drop, and if the Treasury and the Board of Agriculture do not bestir themselves, no doubt proper attention will again be directed to the subject.

THE Berlin Architectural Society, "Vereinigung Berliner Architekten," has during the last months been very busy with some debates on the question of artizans' dwellings for Berlin, and has now published some paragraphs referring to the more prominent of the points which came under their notice during the meetings on the subject. According to these, the barrack form of workmen's dwellings in flats, and in the town, is for the present considered the advisable one for Berlin, detached dwellings outside the city being exceedingly unpopular with those for whom they would be erected. It is considered impossible to give the artisans good dwellings from funds arising from public sources or voluntary contributions, as the undertaking is far too extensive, and the Society therefore strongly recommends that architects occupying themselves with the matter should devote their attention to solving the commercial problem, and producing buildings which can be erected as a sound investment. There are special difficulties at Berlin arising from local conditions, among which are the high price of ground in Berlin, the unpractical size and form of most sites, and the stringent building regulations of the city. It is against these difficulties that the Society ventures to make a series of proposals which will certainly draw the attention of the authorities, in whose hands the solution of the problem seems partly to rest.

IT appears that Warsaw, the capital of subject Poland, is actually having an extensive water-supply and drainage scheme carried out, whilst neither the capitals of Russia proper, St. Petersburgh and Moscow, nor any other town in all Greater Russia can boast of having the same beneficent arrangement, even on paper. The Warsaw works, which have now been in hand for some years, and will, when complete, cost some 15,000,000 roubles (of which 7,000,000 have already been used, and the work now in hand will require 4,000,000 more), have been carried out mainly owing to the energy and perseverance of the aged Mayor, a retired Russian Lieutenant-General, whose connexions and influence at Court have enabled him to get the necessary permissions and grants for his city,—an achievement which only those who know Poland's present relations to Russia can estimate adequately. The works are being carried out under the superintendence and according to the designs of Mr. Lindley, an Englishman, at present head of the Waterworks at Frankfort-on-Main. Another remarkable piece of work at Warsaw is the extensive renovation and enlargement of the Imperial Opera House, at a cost of some 800,000 roubles, voted from Russian funds. This imposing building, which has seat-room for some 1,100 in its auditorium, and is already some sixty years old, seems to have been much in need of renovation, not only as regards safety, but also being far behind the times as regards the ordinary requirements of the present theatre-goer on the one hand, and those of the stage-manager on the other. The work, which is being carried out under the superintendence of the Polish architect, M. Zachowski, was commenced in May last year, and will be finished this autumn, a large staff of workmen being employed night and day. There is no doubt that the improvements in the Opera House will be most marked, especially as to the decoration of the interior of the House, and the extension of the stage, which will now have a total depth of 154 ft. As regards safety, it is, however, difficult to comprehend on what principles, if any, the architect is working. The most costly modern apparatus has been obtained and put into position at random, as it seems, whilst the elementary rules of division into separate risks, mode of exit, and water-supply seem to have been forgotten.

IT is worth noting that the new application of photography, the "kinetograph," by which Mr. Edison proposes to reproduce the entire action of a scene on the stage, for instance, by a series of photographs taken at the rate of forty-six per second, was to some extent suggested by an architect in a letter to our columns about thirty-four years ago. This was Mr. T. C. Hine, of Nottingham, who wrote to us under date June 27, 1857, in reference to a former letter which had appeared in our columns, to the following effect:—

"Assuming that means will be obtained of rendering paper or collodion so sensitive that a distinct impression can be taken in a second of time, some simple machinery is all that is required to take a momentary but continuous series of views, and to present them afterwards to the eye in the stereoscope with corresponding rapidity.

As the impression on the retina would be sufficiently lasting to connect the several representations together, the result must be that moving objects thus taken would be represented *in motion*, and a marvellous effect would be produced."

Mr. Hine's one photograph a second would have given a very jerky performance in comparison with Mr. Edison's forty-six, which represents a rapidity of photography which no one ever thought possible at that time; but it is a distinct suggestion in advance of the idea.

A COLLECTION of old broadsides, prints, and similar documents lent by Mr. J. Eliot Hodgkin, F.S.A., to the Naval Exhibition contains two views of the Old Navy Office, Seething-lane, as in Pepys's day, and King James's College, Chelsea. The latter, which Laud called "Controversy College," was founded in 1610 by Matthew Sutcliffe, Dean of Exeter, for maintenance of twenty fellows "to aunswere all the adversaries of religion," of whom two, Camden and Hayward in the first instance, were to act as historians of the times. The scheme proved abortive, and the wits completed its failure. A small part only, being the southern front, of the building was erected, at a cost of 3,000*l.*; the complete design consisting, as in the print (published by T. Faulkner, 1805), of two courts, the riverside front being flanked by two towers square on plan. The site, known as Thame-shot, was leased by the Earl of Nottingham to Sutcliffe. A larger view is given in Grosse's "Military Antiquities," 1801, vol. ii. A unique farthing token is also exhibited bearing "Chelsey College 1667." In that same year Charles II. bestowed the college upon the Royal Society; four years later he bought the site from the Society for 1,300*l.*, for the Royal Military Hospital, to the establishment of which Sir Stephen Fox, as Evelyn tells us, largely contributed. The Navy Office stood at the south-eastern angle of the junction of Seething-lane and Crutched-friars, with an

entrance from each street. It appears as a range of buildings around three sides of a square; resembling on plan the present Admiralty offices, and with a house in the courtyard. In part of the Seething-lane front Pepys took up his residence on July 6, 1660; he was living there when he closed his Diary nine years later. The office site had been that of a chapel and college belonging to All Hallows, Barking, demolished in 1548, which was subsequently used for the erection of a store-house to receive certain merchants' goods—says Stow—brought from the sea by Sir William Winter, Surveyor of Ships and Master of Ship Ordnance to Edward VI. and Queens Mary and Elizabeth. This Navy office was cleared away, we read, *circa* 1757. At the time of the outbreak of the great fire, Admiral (and General) Sir William Penn had lodgings there and helped, as Pepys describes under date September 5, 1666, to save the office by blowing up some houses near to All Hallows. Elsewhere in the galleries will be found a fine carving of the royal arms by Gibbons, from the board-room of the Victualling Commissioners*; some interesting plans of the several royal dockyards, 1754-9, by T. Milton—the shipping by J. Cleveley, showing, we gather, the dry docks at Portsmouth and Plymouth designed by Edmund Dummer, Surveyor to the Navy *temp.* William III.; and the carved wooden figure of the Little Midshipman, removed to the Minories on the rebuilding of Nos. 156-7, Leadenhall-street, ten years ago. It is the Little Midshipman of "Dombey & Son." The business of the present proprietors was founded by William Heather, chart and nautical instrument maker, at No. 157, in the year 1773: the figure's uniform is not much later in date. Nelson is said to have been a customer of Heather, and the firm possesses some personal relics of the former, which they bought with the business.

THE collection of works of the Early English Masters, now on view at Messrs. Dowdeswell's Gallery in Bond-street, is a really remarkable one. It includes a very fine set of small works by Crome, and an interesting collection chiefly of small sketches in oil, by Constable; these latter are very rough and hasty for the most part, but not on that account the less interesting. Among the works of Crome are one or two of rare beauty and power, especially "Mousehold Heath" (43), "The Return of the Flock" (48), a lovely evening landscape; and "A River Scene" (55). There are some good small works by Cotman, especially "The Harbour" (6), a remarkable example of his power in making a picture out of the most apparently unpromising materials; and several paintings by Holland, one of our best painters of architectural scenes; a small view of "The Piazetta, Venice" (25) is remarkable for its glitter and brightness of effect. Among works by painters less known to fame is a large and very fine ideal landscape by John Glover (65), a composition somewhat after the manner of Claude, but not in Claude's tones. By Thomas Barker there are two or three good works, especially "A View in Italy" (72), a masterly little composition. There is a considerable collection of the works of Morland, of very unequal merit, and a large De Loutherbourg, well painted in its way but looking a good deal like a scene for a theatre. The bulk of the collection however is of real interest, and is well worth a visit.

RECOGNITION OF SANITARY WORK BY THE KHEDIVE OF EGYPT.—The Khedive of Egypt has conferred upon Mr. George Jennings, of Staogate, Lambeth, the decoration of the Order of the Osmanieh (fourth class), in consideration of important sanitary works for his highness, executed by Mr. Jennings.

* The Victualling Office—on site of Edward III.'s East Minster of St. Mary de Grace—was removed to Deptford, and the ground taken (1810) for the Mint. In Seething, *olim* Sydon, lane lived Sir Francis Walsingham and the Earl of Essex, *temp.* Elizabeth.

LETTER FROM PARIS.

THE omnibus strike which for two days completely changed the aspect of the Paris streets, and occasioned a great amount of inconvenience, has had one result in bringing up again for consideration the metropolitan railway scheme, in the various shapes propounded successively by MM. Vauthier, Deligny, Haag, Eiffel, and we forget how many more. Some days before, the special committee sent over to England to study the subject had returned fully impressed with the facilities of locomotion afforded by the London Metropolitan and District Railways; and had also seen the working of the tubular electric railway under the Thames, similar to that which M. Berthier, in 1888, had in vain endeavoured to establish between Vincennes and the Trocadéro. The inventor asked for no assistance from the Municipality, and was prepared to take all the risk himself; but he had to struggle against the eternal system of routine prevailing here, which has stopped one improvement after another. There seems now some probability that M. Eiffel's scheme for a central railway connecting the leading terminal stations may have a chance of being carried out.

As in former years, the Juries of the old Salon have required a temporary closing of the exhibition for the consideration of their awards, though they have only taken one day, this year, instead of three. There is no first medal in painting awarded, but on the other hand two such awards have been made for sculpture, one to M. Pépin, author of the group entitled "Le Joug," the other to a young artist whose death was recently announced in these columns, M. Antoine Gaudet, author of the "Sommeil de l'Enfant Jésus." In architecture, first medals have been awarded to MM. André and Barbaud; second medals to MM. Normand, Yvon, Durand, Dutocq, and Louzier; third medals to MM. Chédanne, Rouillard, Paulme, Dusart, and Charpentier Bosio.

The medal of honour has not been awarded in the section of painting, though there was a great rivalry between the admirers of MM. Benjamin-Constant, Henner, and Rochegrosse. This has not happened since 1884, and the committee have been much attacked for their new rule, which does not admit the result of a relative majority in the second "tour de scrutin." Without this restriction M. Benjamin-Constant, who obtained 105 votes in the second voting, would certainly have obtained the medal.

In sculpture, the medal of honour has been awarded, after two votings, to M. Boucher, author of the figure entitled "A la Terre." This young and clever artist was born at Bourg-St.-Orvin in 1850, and is a pupil of Ramus and Dumont. His principal works are "Enfant à la fontaine," which received a third medal in 1874; "Eve après la faute" (second medal in 1878); "Venus Astartée" (Salon of 1880); "Amour filial," which carried off the "Prix de Salon" in 1881; and "Au but," the plaster group of racers which obtained the first medal in 1886. He received a gold medal at the 1889 Exhibition. He is a very retiring and modest artist, but a very hard worker, and more fine works may be confidently expected from him. The medal of honour has not been awarded either in the sections of architecture or engraving.

The artists rejected at the two Salons have succeeded, in spite of the resistance of M. Alphand, in establishing themselves in the Palais des Arts Libéraux, and once there, have hung the whole length of the bare walls with their pictures. Among the eight or nine hundred pictures there is such an amount of mere vulgarity and so little real art that the impression produced is truly melancholy, and the visitor to them generally

"s'éloigne et ne dit mot."

The only things worth mentioning among them are the "Vague" of M. Brêmond, the "Bal Public" of M. Toulouse-Lautrec, and four decorative panels by M. Bontet. The absurd exhibition held every year by the "Independants" in the Ville de Paris Pavilion becomes almost respectable by comparison. The moral of the whole matter is that the rising tide of artists "déclassés" is assuming alarming proportions, and that this epidemic of painting, which threatens next to overflow into the Galerie des Machines, is not calculated to raise the credit of French art.

The exhibition of the works of animal painters at the Tuileries deserves special mention; among the prominent works are the swan-paintings by M. Gelibert, a large hunting scene by M. Albert de Gène, a pretty picture by M. Jardin, the still-life pictures by M. Gredel, the sketches of horses by M. de Clermont-Galleraude, and a "Bénédiction de meute à moyen âge" by M. Hermann Léon. This clever and interesting exhibition includes also an exhibition of living animals on the part of the Society "d'améliorer les races des chiens en France." We may also notice the exhibition of journalistic art in the Palais des Beaux-Arts, in which the illustrations belonging to nearly six thousand journals, reviews, advertisements, luminous pictures, &c., are methodically classed and arranged. This exhibition, not by any means without interest, makes the twenty-sixth special exhibition in Paris since the beginning of the year.

The various exhibitions installed in the Champ de Mars give a certain animation to the neighbourhood, recalling the scenes of the 1889 Exhibition; and those who visit the Palais des Beaux-Arts, in traversing the Avenue la Bourdonnais, look sometimes with curiosity at a small monument placed in the middle of a lawn at the commencement of that Avenue. It is a small rotunda supported by twelve coupled columns; some funeral urns on the entablature complete the decoration of this little temple, the dome of which, crowned with a cross, shelters a bust of the Prince Imperial. This monument, the origin of which is known to few, was erected by subscription about twelve years ago, to receive the remains of the young Prince; but the permission to bring his remains to Paris not having been granted, the monument raised to him has remained incomplete and without its intended function. Since the 1889 Exhibition its desolate and abandoned appearance has contrasted sadly with the aspect of the gay crowds in its neighbourhood.

The "Union Centrale des Arts Décoratifs has unanimously voted a new request for the grant of the old Cour des Comptes Palace in which to establish its museum. This request will soon be presented to Parliament, in the form of a "projet de loi," by M. Georges Berger, the President of the Union. It is hoped that this new move will bring things to a settlement in regard to the Cour des Comptes. The Opéra Comique question appears also to show some chance of settlement: the scheme put forward by M. Guillotin has been submitted again to the "Conseil Général des Bâtiments Civils," after having been reconsidered by its authors, MM. Dutert and Charpentier, in conformity with the suggestions of M. Garnier, who had formerly reported on it. M. Garnier, in order to facilitate the access to and egress from the house, proposed to enlarge the plan of the theatre at the cost of the Place Boildieu, advancing the façade to the extent of 4 mètres. This idea has been unanimously accepted by the promoters, and it now remains only for the Chamber to pronounce upon it. The consent of the Municipality is also necessary to the giving up the portion of the Place demanded, a condition which M. Garnier considers indispensable; and upon this consent the actual carrying out of the new building in fact depends.

The question of the opening out of the Palais Royal seems also about to be solved. According to the scheme proposed, the houses of the Rue des Petits Champs, between Rue Richelieu and Rue de Valois, will disappear to give place to two small squares on a slope towards the Palais Royal. The scheme, which will much facilitate traffic, will be completed by the demolition of all the mass of houses comprised between Rue de Valois and Rue Radziwill. This is an important work the necessity for which has been felt for a long time back.

The new Avenue de la République is intended to be opened on the day of the National Fête, July 13, in the presence of M. Carnot and the whole official staff. The street is already complete and only awaiting this ceremony. This operation, commenced after the war, creates a pacific revolution in the artisan quarters, and will open out more air and light in a part of the town much crowded with smoky manufactories. The road, more than five kilomètres long, starts from the Place de la République, traverses the whole of the Eleventh Arrondissement, cuts through part of the Fifteenth, and after skirting Père Lachaise and the heights of Menilmontant, abuts against the fortifications opposite the Porte de Romainville. The opening of this road is therefore to be made an important event, along with the inauguration (already mentioned) of the Lycée Voltaire.

Probably on the same occasion the monument to Danton will be inaugurated, which will be no great gain to Paris however. The monument to Balzac, which Chapu left unfinished, but which MM. Falguière and Mercié have just completed, will be in the first instance set up in the Galerie d'Orléans at the Palais Royal. The author of the Comédie Humaine, however, is considered to be entitled to honours in open day, and eventually the work of Chapu will probably be erected either on the Place du Palais Royal, before the gate of the Conseil d'Etat, or on the Place du Théâtre Française, at the entrance of the Avenue de l'Opéra. MM. Falguière and Mercié have also finished the monumental statue of "Alfred de Musset Couronné par la Muse," which is to be installed on the Place St. Augustine, and when the Lafontaine monument has been inaugurated at Ranelagh the French writers cannot complain of neglect in regard to this manner of preserving their names and lineaments for posterity.

In some recent competitions at the École des Beaux-Arts, M. Terra, pupil of M. Laloux, has obtained, in the first class of architecture, a second medal for the course of Enseignement Simultane, and M. Duquesne a "first mention" for decorative design. In the competition in decorative composition,—subject, "Un Char des Arts,"—ten designs have been submitted, and the Committee has awarded third medals to M. Sturm, pupil of M. Redon, and M. Adolphe Lerolle, pupil of M. Peigny.

De Neuville's celebrated painting, "Les Dernières Cartouches," has been purchased for 175,000 f. by M. Hériot, proprietor of the Magasins du Louvre.

The death is announced of M. Maillet de Boulay, curator of the museum at Rouen, and also that of M. Alfred Feydeau, architect. M. Maillet de Boulay had been for many years entrusted with the organisation of the sculpture department of the Salon; and his ability as well as courtesy in this office had made him many friends in artistic circles. M. Feydeau, who had for many years exercised the office of Inspecteur-Général of the Cemeteries of Paris, has left behind him the reputation of a high administrative talent. He was, under the Empire, an assiduous collaborator of M. Haussmann; and it was he who drew out the first scheme for the cemetery of Mery-sur-Oise, which the present administration has unwisely thrown over.

ARCHITECTURE AT THE ROYAL ACADEMY.—VI.

1,831. "Grey Friars, Chilworth, Surrey." Mr. F. A. Walters. A water-colour drawing of a monastery, apparently, on a small scale, the plan showing it as modelled on the usual Mediæval arrangement, the church forming the north side of the block, with a cloister garth in the centre, the chapter-house on the east side, and refectory on the south as usual. The view, apart from the plan, would suggest the idea of a country-house with a chapel attached. The architectural treatment is very simple; a two-storied building with mullioned windows in plain stone walls, and a high-pitched tiled roof. The junction of nave and choir in the church is marked externally by a small saddle-back tower and flèche. The chapel windows are kept high up, leaving an expanse of solid wall below. The expression of the whole is quiet, home-like, and altogether in good taste.

1,832. "National Provincial Bank of England, Manchester;" Mr. A. Waterhouse, R.A. A clever line drawing by Mr. R. Davison, showing the interior of the principal room of the bank, apparently semicircular on plan, with a series of round arches, carried on circular columns, radiating from the centre of the room towards the foreground, a troublesome piece of perspective drawing well carried out. There is a slightly Romanesque touch about the architectural treatment, mingled with bits of more classic detail, while the general feeling of the whole is more Gothic than Classic. It should be a fine and effective interior of its class. A little more careful making out of the detail would have been an improvement to the drawing.

1,833. "Drawing-room, Poles, Herts"; Messrs. Ernest George and Peto. A very charming free classic drawing-room, wainscotted up to the cornice, the ceiling sweeping over in a large ellipse, covered with surface decoration in panelling, with floral ornament added at special points of the design. It may be suggested whether the ceiling design is not rather large in scale for the lower portion of the room, when one compares the size of the panels and their dividing ribs with the scale of the pilasters and capitals below.

1,834. "The Provost-house, Poitiers"; Mr. C. E. Mallows. A good pen-and-ink drawing of this interesting and picturesque old house.

1,838. "St. Mary's Church, Newbury;" Mr. A. E. Street.—Published in the *Builder* for May 23. A solid pen drawing of a Gothic church with the aisles roofed by a series of gables, allowing space for a large traceried window in each gable. The further gable is a little more developed, giving the suggestion of a transept, and beyond it is what seems to be an octagonal stair turret (there is no plan) with a short spirelet over. The porch in the angle at the foreground seems unnecessarily plain in treatment, and comes rather awkwardly into the composition.

1,839. "San Vitale, Ravenna; Mosaic of Sanctuary Vault." Professor Aitchison, A.R.A. This we have already illustrated in monochrome. In the centre circle the figure of the lamb is relieved on a blue ground, powdered with gold stars; of the large compartments one has a dull purple ground and the other two gold grounds, the general design of the foliage is the same in each, but the colouring a little varied with reference to the variation in the ground; and it may be observed that on the gold ground the foliage is a little thicker and fuller in design, and the ground consequently more covered. The brightest colour is in the foliage on the ribs which divide the broad surfaces, which is on a gold ground and divided off from the broad surfaces by strong dark bands edged with a white line. The whole is a most remarkable piece of coloured decoration, rich and grand in effect without the slightest suggestion of tawdriness, and we have to thank Professor Aitchison for so admirable an illustration of it.

1,840. "Design for Proposed Convalescent Home;" Mr. R. W. Edis. There is no plan to this; the drawing is a pen perspective showing a long front with a row of Elizabethan gables and mullioned windows, broken by a projecting centre and by a turret introduced half-way on each side of the centre; at the ends the block of building breaks round obliquely in an elbow towards the front, with two turrets at the angles. A large octagonal tower rising behind, with an enriched upper story and the rest plain, has a picturesque effect. It is particularly to be regretted that there is not a plan to this, as the design is rather unusual and it would be of some interest to see the relation between the plan and the treatment which gives its effect to the building.

1,843. "New Church and Parsonage for the French Protestant Church of London, Soho-square;" Mr. Aston Webb. This is a striking piece of street architecture. The plan shows that the church is behind the parsonage, which latter forms the front to the street, the centre door leading into the church under it, the parsonage is entered by a side door. The ground story is solidly and plainly treated, with a row of five bold round arches, the higher centre one forming the church door, those on the left light the church library, which opens out of the porch or entrance passage; those on the right light the hall of the house. Above this is a corbelled-out wing on each side, and a centre set back and finishing with an arcaded gable. The windows are effectively grouped, and the whole is a very solid and effective piece of architecture, shown in an admirably-executed pen drawing, conveying the effect of finish without mechanical harshness. Nothing is seen of the church in front except the doorway, but a small bell turret rises behind the centre gable of the front.

1,844. "Drawing-room Decoration;" Mr. W. Hensman. This is a large and very elaborately executed interior perspective of a room which represents a kind of *tour de force* of coloured decoration, not ineffective, but in a somewhat tawdry manner. The best part of the colour effect is in the floor and lower portion of the walls, the latter being treated with a gold decoration of rather Renaissance character on a warm but not highly coloured ground. The frieze is more or less Moresque in character, with rather showy colour, and does not harmonise either in colour or design very well with the lower part of the wall. Something of the kind was necessary however to lead up to the ceiling decoration, which is in a very *prononcé* style, divided into compartments of strongly contrasted colour; only a portion of it is seen, but it seems as if such a ceiling would kill everything else in the room, and the ceiling is exactly the place where very strong colour and very assertive decoration should not be found. The drawing shows a hand practised in the art of exhibiting not so much the actual colour of detail, but the effect of the whole under ordinary light, and in this sense it is excellent; but the room would be a very unquiet one to live in.

THE MEGALOPOLIS THEATRE.

CONTROVERSIAL feeling as regards the newly-discovered theatre at Megalopolis has of late run high. It was felt that a final solution of the vexed question of the Greek stage was now possible, and even probable. The interest of this question had spread far beyond archæological circles, and the issue was eagerly looked for. It was known also that the directors of the two archæological schools at Athens, the English and the German, held on some points views diametrically opposed. From a communication made to the *Philologische Wochenschrift* of May 30, it appears that the English explorers have, for the present, conceded more to Dr. Dörpfeld than was expected. The following is a translation of the letter:—

The Theatre at Megalopolis.

In the last issue of the *Journal of Hellenic Studies* a plan was published of the theatre at Megalopolis, now being laid bare by the excavation of the English school. It will be remembered that the most important feature of this plan was the stage structure, a building of the fourth century B.C., which up to a certain height was in a remarkably good state of preservation. The restoration of these remains is of the utmost importance for the question at present pending as to whether, in the earlier days of the Greek theatre, there existed a stage elevated above the orchestra,—*i.e.*, to use the Greek word, a *logeion*. According to the reconstruction given by the directors of the excavation, it was a raised stage in the strictest sense of the word, approached by six steps from the orchestra, and communicating with the hall behind it by three doors. The question after this restoration had appeared seemed once and for all at an end. This reconstruction, especially in respect to the raised stage, was disputed by Dr. Dörpfeld, in the *Berliner Philologische Wochenschrift* of April 11 and 25. He maintained that the wall with the steps must be reconstructed as a *scenæ frons*, or back scenery, either a high solid wall or a row of columns, not as a *logeion*.

In place of continuing this discussion, it seems preferable to publish in a common statement certain facts which have in a great measure come to light during the present spring. The directors of the English excavations recognise that the significance of these facts was first brought forward by Dr. Dörpfeld on the occasion of his visit to Megalopolis.

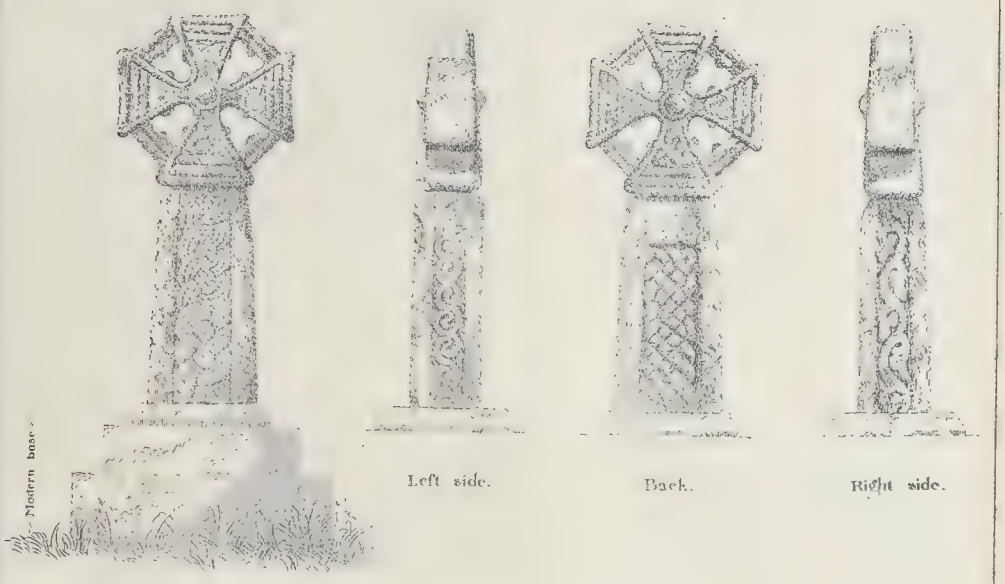
1. The wall with the three door-thresholds must be of later date, both because of their construction and on account of the fact that the bases of columns have been found built into its foundation, and these bases correspond to those of the building behind. This argument for the determination of the height of the steps therefore necessarily falls away.

2. The fourth and fifth steps of the stairs looking towards the orchestra, and restored on the plan as six in number, have now actually been found. But manifestly the three lowest steps do not belong to the original building, but were added to it in consequence of a change in the level of the orchestra. When this alteration took place is matter for conjecture.

3. On the topmost step, or the fifth, the marks of bases of columns are preserved. Some drums lie near at hand, and some blocks from the architrave and the triglyph frieze, which correspond in their dimensions with the slabs of the steps. Dr. Dörpfeld, on these grounds, restored the steps as a stylobate, which supported columns of about 6 mètres in height, with a corresponding architrave.

The directors of the English excavations desire to give careful attention to all these facts and to prosecute further research before they publish their final view with regard both to the details of the building and the chronological relation of its parts. They intend also to enlist the services of an architect, who will examine the matter on the spot before they make their final publication, as the state of affairs is unusually involved and difficult. They have no doubt that at Megalopolis exists

In Prideaux Place, Padstow



the material for the decision as to the original form of the stage-building. In the *Journal of Hellenic Studies* for the current year a statement will appear, in which the facts will be weighed in careful relation to the views of both sides.

ERNEST A. GARDNER.
WILLIAM LORING.
WILHELM DÖRPFELD.

THE PADSTOW CROSSES.

AT a meeting held at the rooms of the British Archæological Association, on May 20, a paper was read, as briefly mentioned in our last (see p. 434 *ante*), by Mr. Arthur G. Langdon, "On the Padstow Crosses," of which the following is a summary:—

Padstow, Mr. Langdon said, was a small town and seaport, situated on the north coast of Cornwall. It possessed three very interesting monuments, which were all within about five minutes' walk of each other. No. 1 was in the churchyard, and consisted of the stump of a cross fixed in its base. No. 2 was in the grounds at Prideaux Place, about quarter of a mile west of the church. This cross was composed of a very fine head and part of a shaft. No. 3 was a cross-head in a garden which adjoined the eastern boundary of the churchyard, and now occupied the site of the old Vicarage House. The two first-named were made of granite, and the last was of white elvan. Other crosses were said to have existed in this parish, but, as far as he had been able to ascertain, no trace of them now remained. Mr. Langdon said that there were several points of interest connected with these crosses, both with regard to the circumstances relating to their discovery, and also as to the ornament upon them. But leaving the particulars of the latter to be fully dealt with hereafter in the separate descriptions of the stones, he would only here remark that of the six examples in Cornwall of crosses which had cusps in the openings, two of them were at Padstow. The other instances would be found at the following places, viz.:—In the churchyards of St. Columb Major and Quethiock, in the new cemetery at St. Breward, and in the grounds of Pencarrow Egloshayle. As a definition of this type of cross, he added that they differed from others of the four-holed class by having the additional architectural feature of three rounded cusps in each of the four holes or openings. These cusps consisted of a bead running from front to back of the stone, and projected, one from each limb, and one from the ring, or connecting pieces between the arms. This treatment of the holes was, he said, another peculiarity confined to Cornwall, but on some of the Irish crosses one was occasionally found on the ring, but those on the limbs were always omitted. Mr. Langdon remarked that he had again the pleasure of stating, as on previous occasions when dealing with the Cornish monuments, that the drawings accompanying his paper were the first which had appeared. The ornament had been drawn from rubbings, the patterns of which were sketched on the spot—a most necessary measure, since it was often impossible afterwards to follow the designs with any certainty unless this precaution was taken, especially in cases like the present, where the ornament was so much worn.

The following accounts of the crosses, containing also a description of the ornament, concluded the paper:—

Cross in Padstow Churchyard.

This was discovered in 1874 by the sexton while digging a grave on the south side of the churchyard. The top of the shaft was about 18 in. below the surface, when the valuable discovery was made known. The late Mrs. Mary Prideaux Brune had them removed and placed for preservation at the south-east entrance to the churchyard, where they now stand.

The height of the shaft is 3 ft. 6 in., and 13½ in. thick. The base is a very large one, of uneven shape, and measures 8 ft. 2 in. long, by 5 ft. wide, and is 13 in. thick.

All four faces of the shaft were sculptured as follows:—*West Side:* A twist, combined with a figure of eight distorted. *South Front:* A splendid example of eight-cord broken plait-work. *East Side:* Twist and ring pattern. *North Front:* A curious design resembling a rude *fleur-de-lis*, produced partly by incised lines, and partly by sunk spaces.

Cross in Prideaux Place.

The head of the cross had been in the grounds for many years, but where it was found is not known. Some years since Mr. Charles G. Prideaux Brune found the shaft in the grounds, and had the two portions mounted on a modern base for preservation. The cross-head was the most remarkable of its kind, the unique treatment of the connecting pieces between the limbs being a characteristic which called for special notice. Instead of the usual ring, the limbs were connected by four straight pieces placed diagonally. The shaft was originally of greater length, as would be seen by the uneven fractures across the ornament; but there was no evidence to prove that it belonged to the head, though probably it did. The head was 2 ft. 8 in. high, and the shaft 3 ft. 4 in. high, 16 in. wide at the bottom, and 13 in. thick.

All four sides were ornamented as follows:—

Front: On the head was a central boss, and on the lower limb a triquetra knot, the only one remaining out of four. On the shaft was treble-beaded figure of eight-knot work.

Left side: On the shaft some very curious scroll work, quite different in character to that usually found in the county.

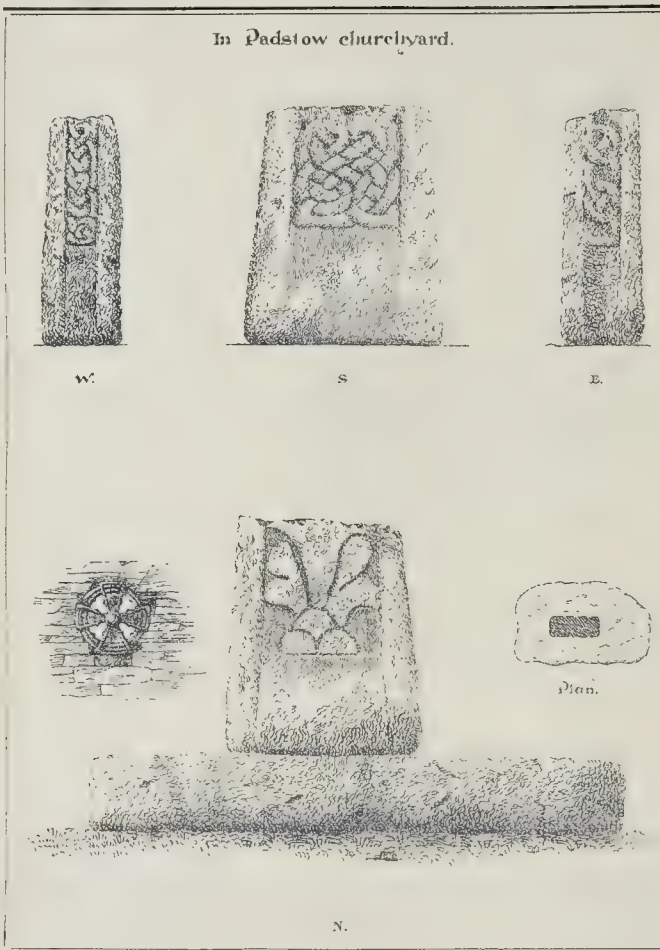
Back: The head was similar to the front, but two triquetra knots remained. On the shaft a division occurred in the plaitwork. The upper portion was not sufficiently clear to define, while the lower consisted of an irregular six-cord plait.

Right Side: On the shaft was foliage, consisting of an undulating stem, springing from which were leaves in the spandrils on either side.

Cross in Dr. Marley's Garden.

This cross, attached to a very small portion of its shaft, was built into the boundary wall on the south side of the garden already referred to. It was supposed to have been found in the churchyard, and was the smallest four-hole cross of any kind in Cornwall, being only 1 ft. 11 in. high, 1 ft. 8⅞ in. wide. There was a central boss with encircling bead at the base, the four holes being enriched with cusps, but like the cross at Pencarrow, there was no ornament on the limbs.

In the discussion which followed, Mr. J. H. Grover, F.S.A., in the chair, and Mr. J. Romilly Allen, F.S.A. (Scot.), took part. The latter observed that, with regard to the ornament on the south front of the cross in Padstow churchyard, it was interesting to note that two similar examples were to be found; one was on a cross now in York Museum, which was brought



from Wakefield, and the other was on a cross in the Leeds Museum, formerly at Ilkley. It occurred also in an MS. at the British Museum, Vespasian A 1.

THE ARCHITECTURAL ASSOCIATION VISITS:

HOUSES IN PALACE COURT, BAYSWATER.

THE eighth and last visit of this Association for Session 1890-91 took place on the afternoon of Saturday, May 23, and was well attended by members. The two houses in Palace Court, Bayswater, which were visited, were designed by the late Mr. J. M. Maclaren, and the architects under whose superintendence they are now being completed (Messrs. Dunn & Watson) met the party, and gave an interesting description of these somewhat original contributions to the domestic architecture of this neighbourhood. The two houses together occupy a space which is nearly square, and with a spacious top-lighted staircase in the centre. The two walls are carried straight across, making a plan which is at once simple and efficient.

In the treatment of the exterior, nothing but the parapet which appears on the roof indicates that there are two dwellings. The one doorway in sight, with the bay windows at either angle, might fairly be assumed to belong to one house instead of two. This treatment is the reverse to making a really large building look as though it were several smaller ones side by side, which treatment is not altogether unknown.

Though the position of the staircase is the same, and the main divisions of the plan similar, considerable variety is obtained in each house, for in one the main entrance is from a side porch, whilst the entrance to the next house is in front. The level of the ground-floors of each house also varies.

The staircase in each case is in the same central position, but the lower part is necessarily varied to meet the plan. The light is ample, and is admitted by a skylight at the top, with a dome placed below, which admits plenty of light, and also admits of ventilation.

The treatment of the balustrade to the stairs is original in several respects, especially in the absence of the usual turned balusters; their place has been occupied by a very deep external string with capping, then a band of raking carved oak, with polished brass scrolls, about 3 ft. apart, to support the handrail. Altogether the effect of this is very satisfactory. The other appointments of these houses are those of a well-designed West-end mansion, and seem to have been most carefully arranged by the architects.

A visit was then made to an adjoining house, which is being erected from the designs of Mr. William Flockhart, but, as the carcase of this building is not yet complete, we must defer our notice of it to some future occasion.

NEW MISSION BUILDINGS, ST. AUGUSTINE'S, FULHAM.—The memorial stone of the new mission buildings for the district of St. Augustine's, Lillie-road, Fulham, was laid last Saturday by the Bishop of Marlborough. The building consists of a large hall, with open timber roof on the first-floor, and on the ground-floor a room of similar area, but with partitions to divide it into three rooms when required, and necessary entrances and offices. There is also a caretaker's cottage. It will be a red-brick building, with Bath-stone dressings and tiled roofs. The contract is 2,247*l.*, the builder being Mr. B. E. Nightingale, and the architects Messrs. J. E. K. & J. P. Cutts.

CONGRESS OF FRENCH ARCHITECTS.

THE following is the order of proceedings for the approaching Congress of French Architects in Paris, as published in *L'Architecture* of May 30. It may be subject to some slight modification, but practically it may be taken as definitive :—

"CONGRÈS DES ARCHITECTES FRANÇAIS DE 1891.

PROGRAMME DES SÉANCES ET VISITES.

Lundi 15 juin, à 2 heures, à l'hémicycle de l'École des beaux-arts:

Ouverture du Congrès. — Constitution du Bureau et ordre des travaux du Congrès.—Nomination des Commissions sur les questions suivantes :

Créations de Musées d'Architecture.—Enseignement de l'Architecture en province.—Conservation des richesses d'art sur les lieux d'origine.—Hygiène.—Honoraires, &c.

Mardi 16 juin, à 9 heures.— Visite au Muséum d'histoire naturelle, sous la conduite de M. Dutert.

— à 2 heures, Amphithéâtre de l'École des beaux-arts:

Compte rendu du Congrès des Sociétés savantes tenu à Limoges en 1890, par M. Ch. Lucas.

Conférence par M. Ch. Normand sur les Monuments anciens de la Morée, avec projections à la lumière oxyhydrique, par M. Mieusement.

Mercredi 17 juin. Excursion à Soissons et Coucy-le-Château, sous la direction de la Société des Architectes de l'Aisne. Départ de Paris (Gare du Nord), à 7 h. 30 ; rentrée à Paris, à 9 h. 25.

Jeudi 18 juin, à 9 h. 1/2, à l'École des beaux-arts :—

Enseignement de l'Administration et de la Comptabilité de l'Architecte, par M. Ed. Delaire.

Conférence sur la Restauration du Château de Bressuire (Vendée), par M. Barbaud. Des gravures explicatives seront remises aux auditeurs.

— à 3 heures. Visite au Sanctuaire du Sacré-Cœur, à Montmarte.

Vendredi 19 juin. Matinée réservée a la Caisse de Défense mutuelle.

— à 2 h. 1/2. Visites aux reproductions en grands modèles, pour le Musée de New York, de Panthéon de Rome et du Temple de Karnak (Égypt), sous la direction de M. Chipiez.

Réunion à 2 h. 1/2, rue Daguerre, 54 (cimetière Montparnasse, ; à 4 heures, rue Duvivier, 13.

Samedi 20 juin, à 10 heures, à l'École des beaux-arts :

Questions à l'ordre du jour.—Communications.—Propositions des diverses Commissions.

— à 1 h. 1/2, à l'hémicycle de l'École des beaux-arts :

Distribution des récompenses décernés par la Société centrale des Architectes français :

M. P. Sédille et M. Loviot, secrétaire principal, rapporteurs.

— à 7 heures. Banquet confraternal à l'Hôtel continental.

NOTA.—Tout membre du Congrès devra prévenir à l'avance le Bureau pour être autorisé à traiter une question relative à l'architecture ou à l'archéologie, en dehors de celles indiquées ci-dessus."

THE LONDON COUNTY COUNCIL:

REVIEW OF A YEAR'S WORK.

THE London County Council held its first meeting since the Whitsuntide recess on Tuesday afternoon last, the Chairman, Sir John Lubbock, presiding.

The Chairman announced that he had received the annual reports of the various Committees of the Council, showing in the aggregate the work done by the Council during the past year. He then proceeded to summarise these reports. We append some extracts from his remarks :—

Finance.—After dealing with the various items of receipts and expenditure, he showed that the rate levied by the Council was only ·55d. in the pound more than that levied by the Metropolitan Board of Works and the County Justices combined, and said that when it was considered that a large increase in the expense of the main drainage necessarily followed from the new works at Barking and Crossness, that the desirability of increasing the efficiency of the Fire Brigade was generally admitted, and that the additions to our parks and open spaces necessarily entailed additional expenditure, he thought it would be admitted that the increase was very moderate.

The Debt and the Annual Expenditure per head of Population.—Another point (continued the Chairman) on which the Council and Metro-

polis will probably wish for some information is on the question of debt. Our debt, not the whole debt of London, which amounted to nearly 40,000,000*l.*, but our portion of the debt, amounted on December 31, 1888, to 17,645,740*l.* In our three years we shall have provided towards the repayment a sum amounting to 1,394,218*l.* On the other hand, an additional sum will have been borrowed for new works. We can calculate exactly how much will be set aside for repayment during the ensuing year, but we cannot foresee with any such accuracy how much will be borrowed. I will, therefore, give you the actual figures for the last two years, during which we have raised for repayment 937,000*l.*, and on the other hand have borrowed 1,205,000*l.*, showing an increase, though not one of a serious character, and one, I need hardly say, all incurred on account of capital outlay. I have thought, if I do not weary you, that, as we hear so much about the heavy expenses and enormous debt of London, it would be interesting to compare them with those of some other cities, and I have taken Manchester and Birmingham as types of English cities, Paris, and Vienna, Philadelphia, New York, and Boston. I omit Liverpool, because the finances of that city have been so greatly aided by the cotton dues. A witty Manchester man once said that in the motto of Liverpool,—"Deus nobis hæc otia fecit,"—the first word ought really not to be "Deus," but "Dues," as it was to the dues that their wealth was owing. The figures are as follow:—

—	Annual Expenditure per head of population.	Amount of debt per head of population (exclusive of gas and water debt).
London	£2 7 9	£9 3 8
Birmingham..	2 16 5	10 1 8
Manchester ..	3 4 7	8 2 5
Vienna	3 2 10	7 11 9
Paris	5 4 7	32 5 3
Philadelphia..	3 16 11	14 5 2
Boston	6 2 3	24 10 7
New York	6 3 4	16 13 3

As regards the American cities, in calculating the expenditure it has been assumed that the receipts and expenditure for gas and water equalled one another; and in the cases of Manchester and Birmingham, if the amounts raised for gas and water were included, we should have to add in each case something over 4,000,000*l.* The amounts for the American cities include the sums expended for gas and water. These figures, then, are, I think, very creditable to London; I do not say to us,—we have not been long enough in existence,—but to the Corporation, to the Vestries, and to the Metropolitan Board.

The Work of the Bridges Committee.—The Bridges Committee, under Mr. Osborne's chairmanship, has the management not only of the bridges, but of the Woolwich Ferry and of the Blackwall Tunnel question. As regards the tunnel, the Council finally determined—

"That the Committee be authorised to instruct the Engineer to prepare drawings, specifications, and conditions of contract for a tunnel not more than 27 ft. external diameter, and not less than 23 ft. internal diameter, provision being made therein for vehicular and pedestrian traffic, and that tenders be invited by public advertisements for the construction of the works.

These are now being prepared under the direction of Mr. Binnie, and it is expected that in a few weeks they will be ready, when advertisements will be issued inviting tenders for the construction of the works. Woolwich Ferry has been working successfully, though it has been much impeded by the fogs of last winter. No fewer than 4,332,978 passengers and 209,849 vehicles were conveyed across the river during the past year. The committee tell us, moreover, that the price of coal has been reduced a shilling per ton in South Woolwich in consequence of the ease with which it can now be supplied from the Great Eastern Railway. In July last Battersea Bridge was completed and opened by Lord Rosebery. It took four years to construct, and cost about 143,000*l.* Our controversy with West Ham, after long and difficult negotiations as to the approaches to Barking-road Bridge, has been amicably settled. The cost is estimated at 72,000*l.*, towards which the Council will contribute 47,500*l.* I see with some consternation that, in the opinion of the committee, several of the bridges across the Thames will soon require to be either rebuilt, repaired, or strengthened.

The Work of the Building Act Committee.—The work of the Building Act Committee is extremely heavy. It is no slight testimony to the scrupulous care and thorough spirit with which Mr. Hutton and his committee carry on the work intrusted to them that so very few questions arise in the Council on his reports. The number of plans which have to be considered by the Council under the recommendation of the Building Act Committee is very large, amounting to many hundred in the year; and the monthly returns of the district surveyors are also very numerous, amounting sometimes to more than 20,000 in a month. The committee has also to supervise the formation of streets, the lines of frontage, the question of underground rooms and cellars, the naming of streets and numbering of houses, supervision of neglected and of dangerous structures, and many other similar duties. They found that, in spite of the various Acts of Parliament already in existence, there were many points on which fresh legislation was required—for instance, the Metropolitan Building Act contains no limitation as to the height to which buildings in London could be carried. Some buildings have consequently been carried to a height which considerably increases the danger of fire, and renders them, moreover, a great eyesore. Several other practical improvements in the law have been suggested by the committee, adopted by the Council, embodied in our General Powers Bill, and successfully passed into law.

Housing of the Working Classes.—The Committee on the Housing of the Working Classes deals with a subject in which the Council has always felt a deep interest. Since the last report of the committee Parliament has passed an important Act on the subject, incorporating most of the amendments suggested by the committee. This Act enables us to close insanitary houses, to co-operate with local authorities in effecting improvements, we bearing part of the expense; and, thirdly, to carry them out ourselves at the general expense of the metropolis. The committee obtained authority from the Council to hold a conference with representatives and officers of the various local authorities in the metropolis, and two meetings have been held. In their last report the committee recommended the Council to undertake the erection of a model lodging-house—not with any idea of supplying lodging-houses generally, but in hopes that it might serve as an example and stimulus to private enterprise. The site chosen is on the Shelton-street area, which we inherited from the Metropolitan Board of Works, and the building will shortly be commenced. The Council have also been in negotiation with the Government for a portion of the site of Millbank Prison. We offered 3,000*l.* an acre for eight acres, but the offer has been declined. But the principal scheme undertaken this year has been that of the Boundary-street area in Bethnal-green. It was urged with much force by Mr. Watney, Mr. Hutton, and others that the initial expense of merely purchasing and clearing the ground was 300,000*l.*; that it was unjust to the ratepayers generally to impose on them so heavy a burden for the benefit of a few favoured persons, and that the course proposed offered a premium to owners to allow their houses to fall into a disgraceful condition; and they argued that the proper course was to close the houses under the powers conferred on us, thus throwing the expense on the owners. Apart from the personal influence of Lord Compton, I believe that what determined the committee and the Council was the consideration that while we could close individual houses at the expense of the owners, in this case it was thought desirable to widen and rearrange the streets, which could only be done by us. I may call the attention of the Council to the fact that the amount already spent under the Acts is 1,611,000*l.*, and the number of persons housed, or to be housed, for that great expenditure, is only 30,500, while there is no annual income, the 1,611,000*l.* being the difference between the price paid for the property and that for which it was resold, so that it is an absolute loss. The committee also tell us that in addition to over 700 houses which will be dealt with by the owners, they have under consideration no less than 270 insanitary areas. These facts, I think, show the clear necessity for most careful consideration and economy in dealing with this important question.

The Improvements Committee.—If the metropolitan improvements sanctioned by the Council have not been so numerous and important as might have been expected, this is certainly no fault either of Mr. Clarke or his Committee. It is due partly, no doubt, to the spirit of economy, and partly to the doubts which have been felt as to the justice of the manner in which the expense of these improvements is now borne. At the same time, the Committee wisely urge the great importance of improving the great arterial thoroughfares, the cost, though large, would be amply repaid by the saving of valuable time. The improvements for which we are now seeking Parliamentary powers in the present Session are as follows:—(*a*) the construction of four bridges and approaches to the Isle of Dogs; (*b*) the widening of Fortess-road, Kentish-town; (*c*) the formation of a new street from Evelyn-street to Creek-road, Deptford; (*d*) the widening of Fulham Palace-road and Queen-street, Hammersmith; (*e*) the widening of St. George's-place, Knightsbridge.

The Main Drainage Committee.—As regards the main drainage, the works at Barking, which deal with the sewage north of the Thames, came into operation in the autumn of 1889. The amount of sewage dealt with in the precipitation works there amounted to over 111,000,000 tons. Already there is a marked improvement in the foreshore there. The Crossness works on the south side are proceeding in a fairly satisfactory manner. I still lean to the belief that eventually it will be found better to deposit the sewage on Canvey Island, or some of the low-lying land near the mouth of the river, or to take it to the sea; but we must certainly first give a fair trial to the present system, which is the result of the report of the Royal Commission of 1884. Apart, however, from this question, Sir B. Baker and Mr. Binnie have pointed out that the present sewers are insufficient for the enlarged and increasing population of the metropolis. At present, even a comparatively small rainfall causes overflows. They conclude, therefore, that new intercepting sewers are urgently required, one on the north of the Thames from Old Ford to Barking, and two on the south, one from Deptford to Crossness, and the other from Dulwich to Crossness. They estimate the cost at 920,000*l.* for the north, and 1,300,000*l.* for the south side of the Thames.

Offices Committee.—Mr. Brereton and his committee have done everything which was possible to promote the convenience of the public and of the staff with the space at their disposal. I regret very much that we have not a more suitable building. Some of the public seem to be under the impression that we wish to build a magnificent council chamber. That is quite a mistake. The present room is sufficient for our simple wants. But our staff is scattered over houses, several of them very ill-suited for the purpose. This is very unsatisfactory, and I am sure that if we had one suitable building it would be much better, not only in the interest of efficiency, but of economy also.

Parks Committee.—Mr. Dickinson and the Parks Committee divide their labours between four geographical and several special sub-committees. This year we have opened three new parks,—Dulwich Park, consisting of 72 acres, presented by the Governors of Dulwich Hospital; Maryon Park, which has been presented by Sir Spencer Maryon Wilson; and Brockwell Park, to which we contributed 61,000*l.*, opened informally on Good Friday. We hope that his Royal Highness the Prince of Wales will open Waterlow Park during the summer. Since 1889 the Council has acquired, assisted in acquiring, or opened twenty-five new open spaces, amongst which I may mention Victoria Park Cemetery, 11½ acres, in the densest part of Bethnal Green, 10 acres at the top of Telegraph-hill, Deptford, Bostall Woods, 63 acres, certain woodlands near Peckham-rye, Wapping Recreation-ground, 9 acres in Fulham, the North Woolwich-gardens, and the Ladywell Recreation-ground. There are also 11 disused burial grounds and churchyards which we have maintained for the past year to prevent them from being closed. Corresponding places elsewhere, however, are maintained by the local authorities, and it is to be hoped that these also may be so. It is evident that the Council cannot be expected to maintain the present arrangement. Moreover, there are several other pieces of ground which it would be desirable to secure as open spaces, and with reference to which negotiations are in progress. One of the greatest maledictions of men in ancient times was that their enemies might see grass growing in their cities. So long, of course, as it is confined to suitable places, this is now one of the boons we most wish for ourselves. Moreover, the Committee are doing their best to make

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these open spaces contribute as much as possible to the health and enjoyment of our people, not only by laying them out and maintaining them in good order, but by making arrangements for bathing, gymnasiums, lawn-tennis, and other games, including grounds for 150 football clubs, and pitches for over 1,000 cricket clubs. Hitherto the only animal life has been the waterfowl on the lakes. The committee is not only endeavouring to render them more varied and interesting, but also to introduce some deer and other animals into the parks, which I doubt not will prove a great attraction. The committee are giving careful attention to the provision of good and cheap refreshments.

The Water Question.—One of the most important and difficult questions which has occupied our attention has been that of our water supply. I am one of those who believe that undertakings of this character are, as a rule, more economically managed by private enterprise than by public bodies, and I should have preferred, therefore, that a certain proportion of profits should have been set aside in gradual reduction of the capital of the water companies, as has been, in fact, done to a small extent. On this point, however, I was in a minority, and the majority on the Council have with them, I believe, the majority in the House of Commons. However, we were all agreed that within a few years a further supply would be necessary, and that steps ought to be taken in that direction. This is, in my judgment, not only a matter of grave importance, but, considering the time that new works must take, also of great urgency. Moreover, assuming it to be desirable that the water companies should be bought up, the Council is to be congratulated on the progress which has been made. By a curious anomaly other London public bodies are permitted to introduce Bills into Parliament with reference to the London water supply, and the London County Council alone was precluded from doing so. This placed us at a great disadvantage. Bills were introduced proposing the constitution of large trusts, on which, of course, the Council was to be represented, but only as one of many bodies. Gradually, however, I think the opinion has gained ground that the Council is the proper body to control the water supply of London. The Corporation has made a suggestion that there should be a statutory Committee of the Council of forty-eight members, forty-two to be nominated by the Council and six by the Corporation, with power to transact the details of business, but subject to the approval of the Council on all matters of importance. This proposal, which Mr. Beal's Committee recommended, and the Council at our last meeting unanimously approved, seems very reasonable. It will, no doubt, greatly facilitate subsequent proceedings if we are working in harmony with the City, and I hope that we may be able to do so in other matters also, as it would certainly be for the advantage of the metropolis. Sir T. Farrer will urge the Committee of the House of Commons to give effect to this undertaking, as the Government have taken no steps on the subject themselves, to enable us to prepare a Bill to provide for an additional supply, and to authorise us to make arrangements, subject to the consent of Parliament, for the purchase of all, or any, of the London water companies. We are very fortunate in having so able a representative as our Vice-Chairman, whose experience and knowledge of the subject will, no doubt, have great weight with the Committee.

Prospective Works and their Cost.—There is only one other subject on which I wish to say a few words, and that is on the additional expenditure which is looming,—I might say lowering,—in the future, and which is a most serious consideration for us all. If some of our committees and the chairmen of committees sometimes think that I have been too anxious for economy, and have resisted proposals for expenditure,—in themselves very desirable,—it is only because of these enormous requirements. First, we have the water supply, — say 10,000,000*l.* for an additional supply, or, if I include the purchase of the water companies, say, roughly, 40,000,000*l.*; main drainage, at the very least, 2,500,000*l.*, or, if the sewage is to be taken to the sea, say 10,000,000*l.*; the Blackwall Tunnel, over 1,000,000*l.*; another lunatic asylum, say 500,000*l.*; and the reconstruction of some of the bridges. Then there is the question of the housing of the working classes. We have already spent 1,600,000*l.*; the Boundary-street scheme is to cost 300,000*l.*, and the committee tell us that they have 270 other areas, not, of course, all of the same magnitude, under consideration. Again, the improvement of our main lines of communication through the metropolis will sooner or later have to be faced. Of course, gentlemen, I do not allude to these facts as indicating any difficulty with reference to London finance. The security of London is undoubted, and much, at any rate, of the expenditure to which I have alluded would itself be remunerative. But I have called attention to it for two reasons. First, as constituting so strong a ground for prudence and economy; and, secondly, as showing the need for some change in the incidence of London taxation. It falls now entirely on the present ratepayers, but many of the improvements made and to be made are of a permanent character, and increase the value of the freehold. It is only fair, therefore, that the owner should bear some part of the expense. This has already been advocated by the report of the Committee of the House of Commons of 1866. Those recommendations we have unanimously adopted, and I know that I represent your feeling in expressing the hope that this important question will receive the early and earnest attention of her Majesty's Government. And now I have concluded. Before another year comes round our successors will have been elected. We do not claim to have made no mistakes, but this, I think, we may say,—that we have spared ourselves no labour and no efforts to promote the comfort and well-being of London, and to fulfil to the best of our ability the honourable and onerous trust confided to us by our fellow citizens.

On the motion of Mr. Benn, seconded by Mr. Beresford Hope, it was agreed that the address be printed and circulated.

After transacting other business, the Council adjourned.

Illustrations.

EXETER CATHEDRAL.*

No cathedral affords a more remarkable illustration than Exeter of the variety and individuality of the architecture of our English cathedrals, in spite of their generally uniform theory of plan, and of the prevalence of the same character of mouldings and decorative detail everywhere at the same dates. No two of them produce the same impression, each has its own especial character and feeling, and nowhere is this more characteristically marked than at Exeter.

Four special points in it must strike every one who studies its architecture critically. First the remarkable and unusual position of the towers. A large central tower and smaller west-end towers is the normal scheme of an English cathedral; here alone (among the cathedrals) we find the central tower dispensed with, and twin towers built at the extremities of the two transepts. Secondly,—a point which however is almost suggested by the position of the towers—we observe the absence of the prominence usually given to the crossing, with its comparatively massive piers and four great arches dividing the nave architecturally from the choir. Here, there being no central tower to carry, the extra mass of pier is dispensed with, the great arches do not interpose, and the vault is seen as an almost unbroken vista from end to end. Thirdly, the equal length of the nave and choir, equal also in their number of bays; a very unusual feature either in a cathedral or any other Mediæval church. The fourth characteristic is to be rather felt than defined; a peculiar modulus of design pervading the building, exhibited mainly in the rather low and wide proportions of the openings, the windows especially. The vertical jamb is remarkably short in proportion to the span of the arch in most of the windows, and the prevalence of this short and wide proportion gives a character of breadth, dignity and spaciousness to the *ensemble* of the building; its expression is less aspiring than in some other cathedrals, but on the other hand more full of breadth and repose, and remarkable for the flood of light with which the wide windows fill it everywhere.

Like others of our cathedrals, Exeter stands on a Saxon site, as is known by tradition and something of a vague kind of historical evidence, quite in keeping with probability, and therefore to be accepted, though no stone of the Saxon fabric is known to remain. The founder of the existing church was (as usual) a Norman bishop, William Warelwast, who commenced his work in 1112, considerably later therefore than many of our Norman churches, as in fact the style of the original portion of the tower would in itself testify, the interlacing arches of the wall arcade halfway up the tower especially.

These two towers now represent the Norman church, to sight at least, though it is probable that a considerable amount of Norman work i encased in the later alterations. The peculiar position occupied by these towers gave rise to a theory at one time that they were the western towers of the original church, which had extended eastward only from this point, a theory which was fully disposed of by the late Archdeacon Freeman in his sketch of the history of the cathedral. His remarks on this point are worth quoting:—

"By putting together such evidences as remain, we may form some idea how far the plan was carried out in the earlier or purely Norman period. The Towers speak plainly for themselves. Eastward from them, at a point near the end of the third bay in that direction, apsidal terminations, traces of which have been found lately,* mark the extent of the Norman choir. Westward of the Towers, the lower courses of the Norman work are visible still, from the North Tower as far as the North Porch. The thickness of the great western wall also accords with this date. On the interior face of both north and south walls of the nave aisles, disturbances of masonry occurring at regular intervals indicate the position of a series of Norman pilasters, the base of one of them having been recently found *in situ* beneath the stone seat. Outside, and corresponding to the position of each several pilaster, may be observed either flat buttresses of Norman form and masonry, or else traces of their removal. These remains, linking together the obviously Norman towers and the massive west wall, point to the conclusion that the Norman Cathedral as Marshall† found it, included the entire nave. Thus, what was completed in the true Norman or round-arched period would seem to have been the towers; the choir of three bays with its apse and aisles; and (probably) apsidal chapels east of the towers, and north and south of the central apse; and the nave with its aisles. All the windows were no doubt, like those in the transept, of a single light; the doors perhaps enriched with Norman mouldings [Norman ornament, the writer probably meant]. But the general aspect must have been as at Chichester, stern and heavy; the roofing probably as at Peterborough, of wood, flat and panelled."

Bishop Marshall extended the choir eastward and built the Lady Chapel, at the close of the twelfth century, and the building was then a Norman and Transitional cathedral. The Chapter-House, under Bishop Bruere, in the first half of the thirteenth century, was the next important addition. A sketch of its doorway has been supplied to us by Mr. Greenslade, to whom we are also indebted for the sketch of the Transitional doorway on the south side of the nave, near the crossing, which in fact was the doorway into the cloister, preserved amid the later alterations to the nave. Carter's plan, on which this is founded, shows the south cloister walk as included within the buttresses, a feature which we have reproduced here as his, in the plan, though it does not represent the present state of the buttresses, and must be taken only as his record of what he found in 1797. It has an odd appearance, but we can hardly suppose Carter would have drawn it so except from observation; and there seems little doubt that the north walk of the cloister must have run under the flying buttresses. The cloister was destroyed in Cromwell's time, and everything about it is more or less conjectural now.

The scheme by which the Norman cathedral was transformed, except the towers, into a Gothic one, was initiated by Bishop Quivil, a master-mind evidently, towards the close of the thirteenth century. He only carried out the transformation of the transepts, the eastern bay of the nave, the lady-chapel, and the portion of the choir adjoining it, and threw the towers into the transepts. His successor, Bishop Bitton, completed the transformation of the

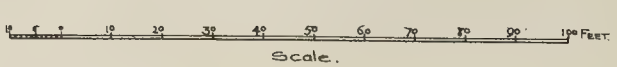
* We may mention that this series of Illustrations of the Cathedrals of England and Wales commenced with Canterbury, which appeared in the *Builder* for January 3 last. Since that date, the following Cathedrals have been illustrated, viz., Lichfield, in the number for February 7; St. Albans (before the alterations of recent years), March 7; Peterborough, April 4; and Wells, May 2. The seventh of the series, viz., Salisbury, will appear in the *Builder* for July 4 next.

* The two lectures on which the Archdeacon's "History" was founded were delivered in 1871.

† Bishop from 1174 to 1206.

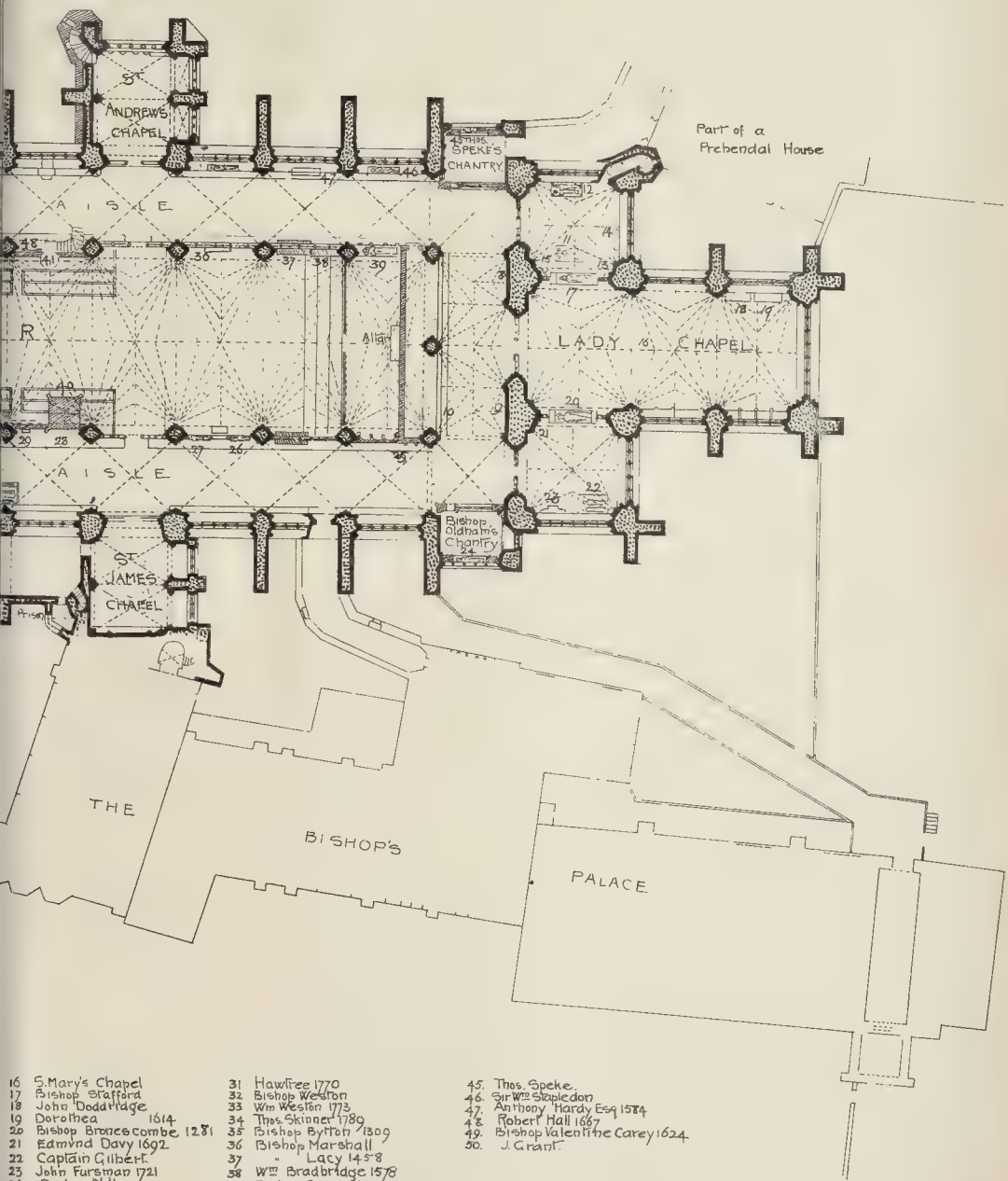
EXETER CATHEDRAL

GROUND PLAN.



Monuments etc.

1 Hugh Courtenay & wife 1372
2 Courtenay brass
3 Mural mon^t Thos. Call Esq 1788
4 " " Benjamin Dollen 1700
5 Monumental Chapel of Wm Sylke, subch
6 Site of Clock given by Bishop Courte
7 Mon^t Bishop Leofricus 1568.
8 Robt Vilvaine M.D
9 James Railard 1599
10 Geo. Baker Archdeacon of Totnes, 177
11 Brass Wm Langton 1400
12 Sir Peter Carew.
13 John Goodwin 1586.
14 E. Barrett
15 John. Bidgood M.D.



16 S. Mary's Chapel
17 Bishop Stafford
18 John Doddridge
19 Dorothea 1614
20 Bishop Bronescombe 1281
21 Edmund Davy 1692
22 Captain Gilbert
23 John Fursman 1721
24 Bishop Oldham
25 Nicholas Hall
26 Bohun Mont
27 Rawleigh "
28 Geo. Lavington LLD. 1762
29 Ed Cotton 1675
30 Bishop Cotton.
31 Hawtree 1770
32 Bishop Weston
33 Wm Weston 1773
34 Thos. Skinner 1789
35 Bishop Bytton 1309
36 Bishop Marshall
37 " Lacy 1455-8
38 Wm Bradbridge 1578
39 Bishop Stapledon 1327
40 Throne
41 Pulpit
42 Font (in Nave).
43 Chapel of Bishop Grandison
44 Cloister.
45. Thos. Speke.
46. Sir Wm Stapledon
47. Anthony Hardy Esq 1584
48. Robert Hall 1687
49. Bishop Valentine Carey 1624.
50. J. Grant.

From Plan by John Carter 1797.
(now in the possession of the Society of Antiquaries).



No. 2096. "HOUNDS IN LEASH."—BY MR. HARRY BATES

SCULPTURE AT THE ROYAL ACADEMY, 1891



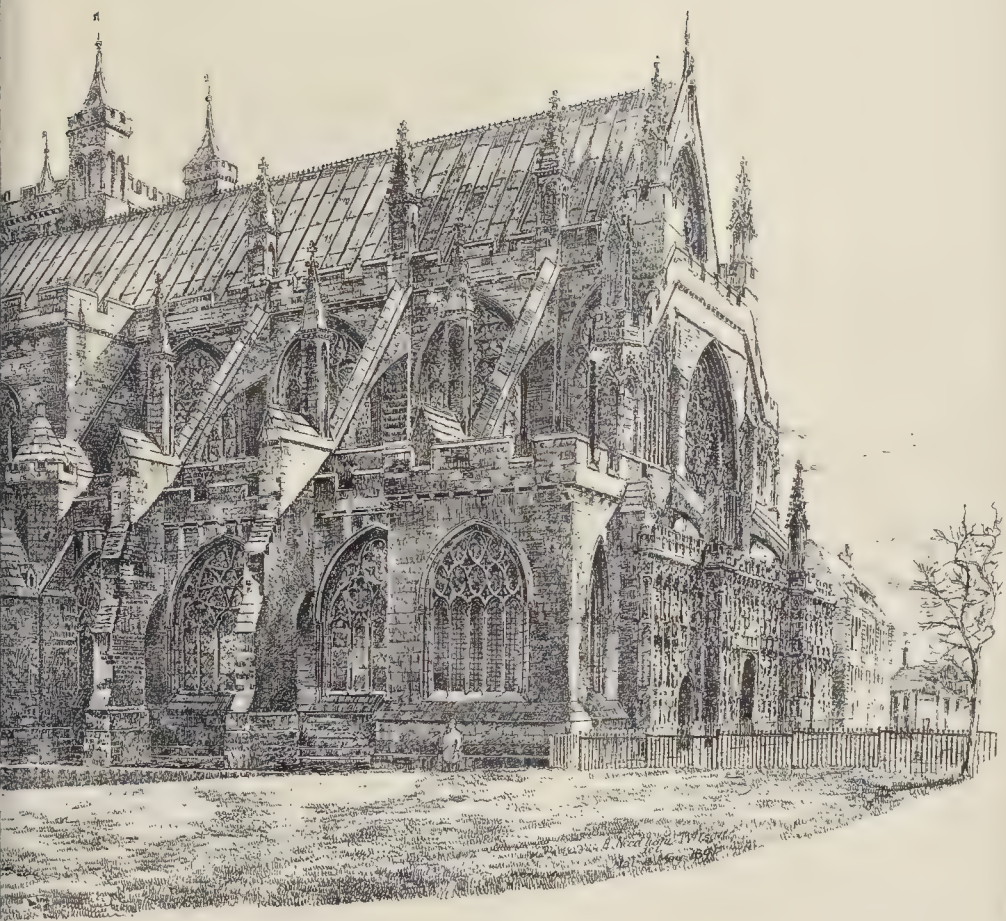
No 2065 "SCIENCE" DECORATIVE PANEL By MR W. HAMO THORNYCROFT, R.A

SCULPTURE AT THE ROYAL ACADEMY, 1891



Cathedrals of

No. 6 EXETER.—Drawn by



d and Wales.

EEDHAM WILSON, A.R.I.B.A



No 2080 "LOVE'S TOKEN."—By Mr. E. Roscoe Mullins.

No. 2097 "THE GENIUS OF

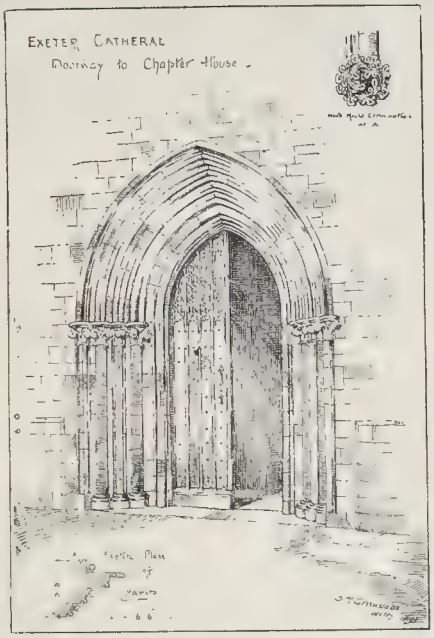


y Mr. T Brock, R.A *elect*



No. 2100. "SONG."—By Mr. T. Brock, R.A *elect*





r at the commencement of the fourteenth ury; and Bishop Grandisson, about the dle of the fourteenth century, completed alteration of the nave, and the vaulting. west front was altered to its present form Bishop Fox late in the fifteenth century, his predecessor Courtenay had added the Gothic pinnacles and parapet to the man towers.

What we see now, therefore, is an originally man church transformed into a Decorated , by means which it would be impossible y to trace except by a demolition of the ding, which alone could reveal how much of Norman work was cased in, how much was ually removed and destroyed. The Norman ers, in their square and massive strength, ain as a kind of central rock around which later Gothic has grown as on a base.

nternally the remarkable points are the bold l effective plan of the piers, a series of clus- d shafts of three different orders, and the design and execution of the nave vaulting, at the period when the radiation of the nerous ribs was beginning to suggest that form into which it was ultimately to be olved; the ribs are collected on to an un- ally small impost, and the collecting and reing of them has cost the builders no small ible, not without a certain amount of ingenious dging." The beautiful minstrel gallery, h its canopied front filled with statues, is ther special feature of interest, and also elaborate and varied carving of the g vertical bosses or corbels from which vaulting shafts spring, though it must admitted that these are not very construc- al in design, and seem rather ornaments to tail of the vaulting shaft than designed for chitecturally) supporting it. Externally re is a remarkable degree of solidity and ssiveness about the work, unusual at that e, and which in itself seems to speak of the rit of the Norman design still affecting the le and proportions of that which superseded it. is look of strength and massiveness is well veyed in Mr. Wilson's drawing. Next week propose to supplement this view by another the east end taken from a water-colour tch made on the spot by Mr. Wilson, and ich he has kindly placed at our disposal.

In 1871 Sir Gilbert Scott was commissioned make a "restoration" of the interior of the hedral, which was probably at that time y much in need of thorough renovation, and the fabric was in sound condition there was er all little done in the really objectionable m of restoration, viz. building new imita- ns of old work; nor has the exterior been much touched. New stalls were executed by Messrs. Farmer & Brindley from Scott's designs, and a new reredos executed by the same firm was put up, of not very happy design, which (as our older readers will remember) was the subject of a violent controversy at the time, and was even officially condemned by the bishop and ordered to be removed, but, as in most such cases when the work has actually been executed and fixed in its place, retained its position after all.* A new pulpit, in memory of Bishop Patteson, was inserted at the same time.

Scott also introduced the open screen between the nave and choir, which must be admitted to be an architectural as well as a ritual improvement to the interior; and in doing this he left the organ in its old position over the screen, a position which we venture to think is architecturally a fine incident in a cathedral interior, and not a detriment to the effect, as has been maintained of late years by many people. The difficulty in the way of maintaining this position for the organ lies of course in the great size to which modern organs have developed, and which would render it now hardly possible to plant the whole instrument on the choir-screen in the old position; but nevertheless the old choir-screen organ-case made a fine central object in the vista of our cathedrals, and we regret to have lost it in so many cases.

The view of the cathedral which we publish is taken from the north-west, and was made especially for this publication by Mr. A. Needham Wilson.

SCULPTURE AT THE ROYAL ACADEMY.

THE sculptural subjects illustrated on the two single-page plates and on the double-page plate will be found specifically referred to in our second article this week.

THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—An Eastern Counties District Meeting of this Association will be held at Norwich on Saturday next, June 13. After the District business has been transacted, a short paper descriptive of some of the public works of Norwich will be read by Mr. P. P. Marshall, the City Engineer. Time permitting, one of the following papers will then be read:—"The Testing of Portland Cement," by H. K. G. Bamber, F.C.S.; Gas-"Burners and Burning," by E. C. Sayer, Assoc. of Gas Institute. In the afternoon the members will visit the Castle Museum Works, and will inspect a new sewer in progress.

* An illustration of the new stalls will be found in the *Builder* for October 30, 1875, one of the new reredos in January 3, 1874, and another of the new chancel screen in May 13, 1876.

THE ARCHITECTURAL ASSOCIATION:

ANNUAL DINNER.

THE annual dinner of this Association was held on Thursday, the 28th ult., at the "Criterion" restaurant, Piccadilly, Mr. Leonard Stokes, F.R.I.B.A., President, in the chair. There was an unusually large attendance, and the gathering was in every way a great success.

The toast of "The Queen and the Royal Family" having been duly honoured,

The Chairman, in proposing "The Royal Academy," coupled with the name of Professor Aitchison, A.R.A., said he supposed that all his hearers had pretty well settled in their own minds the question whether architecture was an art or a profession (a voice: "Both") He fancied they had all come to the conclusion that it was an art. No doubt architecture was hampered by greater restrictions than most other arts, but nevertheless it was an art, and architects were, or should be, artists. As artists, then, they could not fail to receive the toast with favour. They all knew the history of the Royal Academy, and were fully cognisant of what it had done for art; but if he might be allowed to say so in the presence of a member of the Academy, he did not think that that august body did quite what it might do for architecture. He felt quite sure that their old friend Professor Aitchison would do what he could at the Academy to induce his colleagues there to think a little more than they apparently did at present about the claims of architecture. It might be said that the Architectural Room at the Academy did not draw many shillings from the pockets of the public; but that was, he hoped, far too sordid a view to be justly attributed to the Academy. Architecture ought certainly to be better represented numerically in the *personnel* of the Academy. While there were forty full Academicians, only three of them were architects; and of the thirty Associates of the Academy only three, again, were architects, making only six architects out of a total of seventy members of the Academy. Now he ventured to say, with all deference, that a proportion of one architect to twelve painters and sculptors was not a just one to be adhered to in a Royal Academy of *Arts;* it was not fair treatment of the art of architecture by such a body. Nevertheless, the Royal Academy, with all its faults, was a first-rate institution, and he therefore asked his hearers to drink to its health and prosperity, coupled with the name of Professor Aitchison.

Professor Aitchison, A.R.A., in responding, said he thanked the company very heartily for

the kind way in which they had received the toast and the mention of his name. Although, as the Chairman had said, everybody knew all about the Royal Academy, he was afraid that it was too often forgotten that for a very long while the Academy was the only institution that did anything for the advancement of architecture. It not only gave a certain amount of space for the exhibition of architectural drawings, but it opened its schools to architectural students who could draw, and it gave medals for design, and a studentship, which enabled the young man who gained it to travel to Rome, and to stay there for two years' study. In the days of which he was speaking Rome was looked upon as the head-quarters of the fine arts. It should be recollected, too, that the Academy was started on what might be called the principles of the Renaissance, and in those days it was thought that architects as well as all persons who were connected with the visual fine arts needed but one special education. It was believed that the great foundation of the visual fine arts was the ability to draw the human figure correctly. The power of drawing the human figure was a very valuable one, but it was not everything in architectural education, and therefore, as an architect, he was glad that the Academy some years since opened a school for architects, which had the advantage of a magnificent collection of casts of ornament, with the possibility open to many of the architectural students of attending the figure school. In the Architectural School of the Academy, a subject was given by one of the architectural members, who took it in turn to act as Visitors and to go round the benches of the students to impart information to them. A great deal of what the Chairman had said in the course of his criticisms of the Academy was perfectly true and just; but he would like to remind architects that other people did not see their profession as they themselves saw it. The Academy would continue to do all it could to promote the arts of drawing and composition, but he was afraid that it would resolutely set its face against any steps for teaching what it rightly or wrongly regarded as the comparatively insignificant and mechanical parts of professional work. In concluding his remarks, Professor Aitchison, as an old member of the Association, recalled some interesting reminiscences of its early years, when it met in Lyon's Inn,—a place long since passed away under the hand of the "improver." He said he was delighted to think that the brilliant though solid work done for the profession by the Association during the fifty years of its existence was about to take a new and very important departure, in which he wished them every success. He hoped that their new curriculum would attract a number of young men who would turn out to be brilliant architects; but while he hoped that the Association would get a sufficiency of men to enter their names for the new classes, &c., he trusted that there would not be too many aspirants.

The Chairman next proposed "The Royal Institute of British Architects," coupled with the name of Mr. J. M. Brydon, who, he said, had ever been ready to advance the interests of the Association in every way, especially in his position as a member of the Council of the Institute.

Mr. Brydon made a humorous speech in reply, saying that whatever might be the merits or demerits of such watchwords as "Examination" and "Registration," there were no differences of opinion as to the value of "Education," which the Association had very wisely taken for its motto. In conclusion, he proposed "The Architectural Association and the New Scheme."

Mr. A. B. Fite next proposed "The Donors," and in the course of his remarks he announced that the following sums had already been promised to the Association in aid of the initial outlay needed for the extension of its work, viz., Mr. Alfred Waterhouse, R.A., 105*l.*; Mr. J. Macvicar Anderson, 52*l.* 10s.; Mr. Aston Webb, 52*l.* 10s.; Mr. Leonard Stokes, 52*l.* 10s.; Sir Arthur Blomfield, A.R.A., 25*l.*; Mr. F. T. Baggallay, 25*l.*; Mr. John Slater, 25*l.*; Mr. J. L. Pearson, R.A., 21*l.*; Mr. William Emerson, 21*l.*; Mr. E. W. Mountford, 21*l.*; Mr. R. Norman Shaw, R.A., 10*l.* 10s.; Mr. T. G. Jackson, 10*l.* 10s.; Mr. Ernest George, 10*l.* 10s.; Mr. E. A. Gruning, 10*l.* 10s.; and Mr. Owen Fleming, 10*l.* 10s. That list, he thought, was a very good one to begin with.

Mr. John Slater next proposed "The Visitors," coupled with the name of Mr. Basil Champneys, who responded.

The Chairman next proposed "The President elect, Mr. F. T. Baggallay," saying that Mr. Baggallay's past record in connexion with the Association augured well for his occupancy of the Presidential chair.

Mr. Baggallay, in replying, said he would do all he could to justify his election to that important position. He concluded by proposing "the Retiring President and Officers," special mention being made, amidst cheering, to the two years' hard work of the retiring President and the four years' assiduous labour of Mr. F. R. Farrow as honorary secretary.

The Chairman and Mr. Farrow then replied, the Chairman making special mention of the services rendered by Mr. A. W. Earle in making the gathering a success. Mr. Earle having said a few words in reply, the proceedings were brought to an end by a performance by the excellent string band of the A.A., which made its first public appearance on this occasion.

THE ARTISTS' BENEVOLENT FUND:

ANNUAL DINNER.

THE eighty-second anniversary dinner in aid of this Fund was presided over on Saturday evening last by the Duke of Fife, who, in proposing the principal toast of the evening, "Prosperity to the Artists' Benevolent Fund," said that English people were often taunted with the reproach that they were not an artistic nation, and he feared that, if we were to be judged by some of our out-of-door performances, there was some ground for the charge. But of late years the development of artistic feeling in this country would bear comparison with any similar movement elsewhere. Some people seemed to think that there was a natural connexion between blue skies and fine art, but it appeared to him that if there was a task conspicuously worthy of art it was to embellish our grimy surroundings, to enliven our murky atmosphere, and to relieve the tedious monotony of our daily life. British artists had never failed to do this, and in his view we owed them a debt of gratitude, because, apparently under discouraging circumstances, they had done so much to educate all classes. He was afraid, however, that the battle of life was often an arduous one for them, and that of many artists throughout their life it might be said, as was once touchingly observed of Turner by a great writer: "He took poor prices that he might live, but he made noble drawings that he might learn." It was to meet such cases as that of a struggling artist, conscious of his own talents, but unable to make any way in the world, that this admirable institution was founded about the beginning of the century. It provided not only for the artist himself in sickness and in old age, but also for the widow and the orphan, and since its foundation had distributed nearly 55,000*l.* in such relief. He would not venture upon any dry dissertation on the principles of self-help, but would merely point out that the institution was based on that wisest and soundest of lines. Still, self-help, admirable as it was, was not sufficient to meet the requirements of the Fund, and he made an earnest appeal for further public support on its behalf.

Mr. T. H. Maguire responded, and other toasts followed. During the evening subscriptions and donations were announced to the amount of about 700*l.*, including an annual subscription of 100 guineas from her Majesty the Queen, the patron of the society.

The "Artists' Fund," we may add, is composed of the Benevolent Fund and the Annuity Fund. It was established in the year 1810, and received in 1827, from George IV., a Royal Charter of incorporation.

The Artists' Annuity Fund is raised and wholly supported by the contributions of its members for their own relief in sickness and old age; it neither asks for nor receives any support from the public. All artists in painting, sculpture, architecture, and engraving are eligible to become members.

The Artists' Benevolent Fund, which is a purely charitable society, has for its object exclusively the relief of the widows and orphans of members of the Annuity Fund left in need; it is supported by the donations and subscriptions of the patrons of the fine arts and artists, and by annual contributions of the members of the Annuity Fund. These annual sums, payable to the most needy of the widows, and to the orphans, are respectively supplemented by donations and from the interest on certain benefactions. During the past year forty-nine widows and fifteen orphans received annuities, amounting in the whole to 1,035*l.* 13s. 4d. The annual sum of 20*l.* is paid to each widow, and the annual sum of 6*l.* to each orphan under the age of sixteen. The Committee are anxious to increase these allowances.

COMPETITIONS.

MUNICIPAL BUILDINGS, ROCHESTER.—We are informed that Mr. Ewan Christian, the assessor appointed by the Town Council, has made his selection from the designs submitted in this competition in the following order:—First premium to the design bearing the motto, "Georgian," by Messrs. F. T. W. Goldsmith, A.R.I.B.A., and E. J. Gosling, joint architects; second premium to "Hope," by Mr. Arthur Baker, F.R.I.B.A.; third premium to "Experience," by Mr. G. E. Bond.

PAROCHIAL HALL, ST. ANDREW'S, FULHAM.—On Monday evening a meeting of the St. Andrew's, Fulham, Parochial Hall Buildings Committee was held at St. Andrew's Vicarage, to consider the competition drawings submitted, by invitation, by four architects. The committee selected the set sent in by Messrs. J. E. K. & J. P. Cutts. The building will consist of a large hall on the first-floor to seat 505 persons, with a large platform, and a green-room on each side of it, the platform and green-rooms being so arranged that they can be used with the greatest convenience for meetings, concerts, and theatrical performances. There is a kitchen in connexion with one of the green-rooms to supply refreshments. The hall is approached by two separate entrances, off the two roads which bound the site, each having a cloak-room and offices. On the ground floor there is a large room, with two entrances and two smaller rooms; the suite of rooms is for use for Sunday-schools, clubs, gymnasium, &c. There is also a caretaker's cottage. The materials will be red brick facings, with Bath stone dressings and slate roofs. The approximate estimate for the buildings is 3,000*l.*

CHADWELL ST. MARY BOARD SCHOOL.—We are informed that the design of Mr. Horace T. Bonner, A.R.I.B.A., has been accepted in this open competition. Upwards of thirty sets of designs were submitted.

SEVENTH INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

WE have received the programme of this Congress corrected up to May 1 last.

The Congress will be inaugurated on Monday, August 10, 1891, by a general meeting in St. James's Hall. H.R.H. the Prince of Wales, the President of the Congress, will preside at the opening meeting, and will take the chair at 3.30 p.m.

The meetings of the sections will be held on August 11, 12, 13, 14, from 10 a.m. to 2 p.m., in the room of the Royal and other learned societies at Burlington House, Piccadilly; at the University of London, Burlington-gardens; and at the Royal School of Mines in Jermyn-street.

Saturday, August 15, will be devoted to excursions, and on Monday, August 17, at 11 a.m., the closing meeting of the Congress will be held in the Theatre of the University of London.

The aim of the Congress is to stimulate public interest in the progress of hygiene and demography, by which latter term is understood the study of the life-conditions of communities from statistical points of view; and to afford persons interested in these subjects an opportunity of meeting, and of elucidating questions connected therewith by conference and debate.

Section VI. of Division I. (Hygiene) will be devoted to "Architecture in Relation to Hygiene." This section will meet in the West Examination Hall in the University of London, Burlington-gardens. The President of the Section is Sir Arthur W. Blomfield, M.A., A.R.A., F.R.I.B.A.; and the Vice-presidents are Messrs. George Aitchison, A.R.A., F.R.I.B.A., Professor of Architecture at the Royal Academy; Thomas Blashill, F.R.I.B.A., Superintending Architect to the London County Council; Ewan Christian, Past-president R.I.B.A., Royal Gold Medallist; Arthur Cates, Vice-president R.I.B.A.; Rogers Field, B.A., M.Inst. C.E.; T. Hayter Lewis, Past Vice-president R.I.B.A., Emeritus Professor of Architecture; F. J. Mouat, M.D., LL.D., F.R.S.; A. H. Downes, General Inspector, Local Government Board; John Slater, B.A., Lond., Member of Council, R.I.B.A.; Percival Gordon Smith, F.R.I.B.A., Architect to the Local Government Board; H. Saxon Snell, F.R.I.B.A.; Hy. Heathcote Statham, F.R.I.B.A.; and William Whitaker, B.A., F.R.S., F.G.S. The

Secretaries of the Section are Messrs. Thomas W. Cutler, F.R.I.B.A., 5, Queen-square, Bloomsbury, London, W.C.; John J. F. Syken, M.B., B.Sc., Medical Officer of Health for the Parish of St. Pancras; and Ernest Turner, F.R.I.B.A., Member of Council of the Sanitary Institute, 246, Regent-street, London, W. The programme of the section includes the following subjects:—

I.—Laying out and Extension of Towns.—A.—Reservation of Open Space: For purposes of light and air—For means of communication—For recreative and ornamental purposes. B.—Streets and Ways: Alignment—Width of roadways and footways—Paving—Boulevards—Subways—Business thoroughfares—Shops—Arcades—Markets—Mews—Street refuges—Public conveniences—Line and height of building frontages—Projections.

II.—Buildings.—Site—Aspect—Curtilage—Materials—Exclusion of damp and ground air—Basements and areas—Roofing—Collection and storage of rain water—Water supply—Sanitary appliances—Drainage—External and internal surfaces—Walls—Floors—Ceilings—Partitions—Lighting, natural and artificial—Ventilation—Heating by hot air, hot water, and steam—Open fire-places—Close stoves—Consumption of smoke. C.—Private Dwellings: I. Self-contained houses. II. Residential flats. D.—Dwellings partly or wholly used in common: I. Artisans' and labourers' dwellings. II. Common lodging-houses. E.—Trade Premises and Workshops: Factories—Restaurants—Bakehouses—Dairies and milk shops—Cowsheds—Stables and mews—Laundries. F.—Public Buildings: Hospitals—Infirmaries—Asylums—Educational institutions—Gymnasia—Places of Worship—Theatres—Public halls—Hotels—Courts of Justice—Prisons—Police-stations—Coroners' courts—Mortuaries—Markets—Abattoirs—Baths—Wash-houses.

All communications relating to this Section should be addressed to Mr. Ernest Turner.

Section VII. of the same division will be devoted to "Engineering in Relation to Hygiene." This Section will meet in the East Examination Hall in the University of London, Burlington-gardens. The President of the Section is Sir John Coode, K.C.M.G., President of the Institution of Civil Engineers; and the Vice-Presidents are Sir Robert Rawlinson, K.C.B., Vice-President of the Institution of Civil Engineers; Mr. Thomas Hawksley, F.R.S., Past President of the Institution of Civil Engineers; Mr. James Mansergh, Memb. of Council of the Inst. C.E.; Major Hector Tulloch, R.E., Chief Engineering Inspector to the Local Government Board; Mr. Alex. R. Binnie, M.Inst. C.E., Engineer-in-Chief to the London County Council; Mr. H. Percy Boulnois, Memb. Inst., C.E., President of the Association of Municipal and County Engineers, City Engineer, Liverpool; Mr. James M. Gale, M.Inst. C.E., Glasgow; and Professor Henry Robinson, Memb. Inst., C.E., Professor of Civil Engineering at King's College, London. The Secretaries of the Section are Messrs. Reginald E. Middleton, M.Inst.C.E.; Mr. H. C. Houndle, Local Government Board, S.W.; and Mr. J. Wallace Peggs, Assoc. M.Inst. C.E., Member of Council of the Sanitary Institute. The programme of the Section is as follows:—

I.—*Sewerage and Sewage Disposal.*—A.—Water-carriage System: Construction, gradients, and ventilation of sewers—Separation of sewage from rain water—Exclusion from rivers of rain water from streets and roofs—Sewage disposal—Discharge of crude sewage into tidal waters—Discharge into tidal waters after deposition of solids—Irrigation and filtration—Chemical treatment—Electrical treatment. B.—Other Systems: Collection and disposal of sewage by systems other than those where water is used.

II.—*Water Supply.*—Collecting areas—Quality and quantity of water collected—Quality of potable water—Storage and service reservoirs—Subterranean sources of supply—Geology as effecting water supply—Filtration and purification of water—Softening of water—Distribution of water—Separation of supply for potable and other purposes—Utilisation of sea water for potable purposes by distillation, also for watering and cleansing streets, and for flushing purposes—The effect of subsoil water on health.

III.—*Pollution of Rivers.*—Prohibition of pollution—Modes of prevention as regards sewage, chemical, manufacturing, mining, or other refuse—The spread of disease by polluted rivers—The self-purifying power of rivers.

IV.—*Town Refuse.*—Collection of refuse and its disposal—By fire—By conveyance to the sea—By chemical destruction—By disposal on land or otherwise.

All communications relating to this Section should be addressed to Mr. Reginald E. Middleton, 25, Parliament-street, London, S.W.

Section IX. will be devoted to "State Hygiene."

Division II., "Demography," will include Industrial Hygiene. It deals with the conditions of communities from a statistical point of view. This Division will meet in the Theatre of the Royal School of Mines in Jermyn-street.

BUILDERS' BENEVOLENT INSTITUTION.

THE seventy-fourth election of Pensioners on the funds of this Institution was held on the 28th ult., at the offices of the charity, on which occasion one man and one woman were elected.

The President, Mr. William Shepherd, presided, and among those present were the Treasurer, Mr. G. Plucknett, J.P., Mr. T. Surling, Mr. Basil E. Peto, Mr. R. Perkins, Mr. G. N. Watts, and others.

Mr. T. Stirling and Mr. T. Rider, jun., acted as scrutineers.

The successful candidates were Charles Sabey, who polled 1,636 votes, and Mrs. Bessy Webb, 3,051 votes. It was the fourth application of the former and the third application of the latter.

Votes of thanks to the scrutineers and the Chairman terminated the proceedings.

Correspondence.

To the Editor of THE BUILDER.

THE ROYAL ACADEMY AND ARCHITECTURAL EDUCATION.

SIR,—In a leading article which has just appeared in "A. A. Notes," the following paragraphs occur:—

"To the Royal Academy, living as it has ever done in the sunshine of Royal and public favour, and every year drawing vast sums from thousands of eager sightseers to the augmentation of its own endowments, the task would have been easy; but it had become, what it still remains, a corporation of oil-painters, consistently ignoring the intelligent study of other branches of art, and, until lately, scarcely acknowledging that the art, as architecture, was within its province at all."

"Both of these bodies" (the Institute is mentioned in a previous paragraph) "proposed to encourage the study of architecture by means of prizes, scholarships, art medals; but nothing further. No systematic course has ever been instituted whereby a man entering the profession could by any possibility acquire that knowledge which would enable him to practise an art so complicated as that of architecture, and so, with the customary self-helpfulness of their race, the students of London set themselves the task of providing for themselves that which the Institute and the Academy, either from poverty or wilfulness, declined to provide, and which the masters, bound by contract implied in the articles of apprenticeship, were utterly incompetent to give."

Seeing that the Association is about to appeal to the profession generally for their assistance, it seems to me very unwise (to say the least of it) to have introduced the last phrase, even if it be true, which I do not think it is. My object, however, in writing to you now is to call attention to the fact that until the removal of the Royal Academy to Burlington House, it was absolutely impossible to find class-rooms for the study of architecture.

Shortly after the erection of the new Royal Academy, I was instructed by the Council to draw up a report on the facilities which might be given in their new premises for the study of architectural drawing and design. Having studied in the École des Beaux-Arts, Paris (and, during my tour as travelling student of the Academy, having visited all the principal schools of Germany), I drew up a report recommending a course of study based thereon, but one which would not conflict with the existing system of pupilage (a system with which I was not at first quite in sympathy, but which, curiously enough, my experience of the last twenty-one years has taught me to be, under certain conditions, by far the best: witness the extraordinary development of English architecture during the last fifteen years). This report having been presented to the Council, I was appointed in 1870 Master of the School, and instructed to carry it out.

In 1877 the late Mr. George Edmund Street, R.A., being on the council, and various modifications being made in the schools to improve the system then adopted, he proposed that in future the architectural members of the Academy should, as well as the painters and the sculptors, undertake the duties of visitorship. The proposition was gladly accepted by the council, and Mr. G. E. Street, R.A., Mr. Norman Shaw, R.A., and Mr. J. L. Pearson, R.A., were elected visitors for the year; the undertaking being to attend on one evening in the week (the architectural schools being open on three evenings per week). This system has been uniformly kept to down to the present day; and, in addition to those already named, Mr. Alfred Waterhouse, R.A., Prof. Aitchison, A.R.A., Mr. G. F. Bodley, A.R.A., and Sir Arthur Blomfield, A.R.A., have all taken in turn their duties as visitors. It is not for me to dilate on the special advantages which the architectural students must have reaped from the continued advice of the most eminent men of the profession, or to dwell on the frequent interference with their professional duties which the tasks they took upon themselves must have imposed. It is only necessary for me to point out that the past and present presidents of the Association studied under some of the above-named visitors, as well as at least four of the present members of the committee. The real facts of the case must, therefore, have been perfectly well known to those who are entrusted with the conduct of the "A.A. Notes."

I contend, therefore, that the two paragraphs in question are misstatements likely to mislead the profession and the members of the Association, and also to do much more harm than good to the new scheme of education which they are now bringing forward.

I may say that it was the entire absence of any recognition of existing courses of architectural study in London (other than that of the Association), which has caused me to stand aloof from this new movement, and I am not alone in thinking that the chief vital element, viz., that of mutual self-instruction, has been too heedlessly thrown aside.

R. PHENÉ SPIERS.

THE BERLIN EXHIBITION AND THE COUNCIL OF THE R.I.B.A.

SIR,—By invitation from the Council, I sent them a drawing for exhibition at Berlin. I was surprised to find it returned to me, and still further to learn that, though definitely selected by the Art Standing Committee (who were in the letter of invitation named as the selecting body), my drawing was afterwards brought before another body, who overruled that selection. As I had received no notice of this new body, and had been given no option of withdrawing my work, I wrote to the Council for some explanation of what seemed to be a breach of the understanding upon which I had accepted their invitation. I also begged that the *bona fides* of the transaction might be made clear to me, by giving the names of this fresh body of examiners.

So much seemed due to me. The Council of the Institute have, however, while admitting the facts, denied me any full explanation; and, particularly, have refused to make known the members of the selecting Committee.

I hope you will allow me a place in your columns for this statement, for though, so far, a private matter, still it is of public concern that the Council of that body, which claims to represent British architecture, and to whom, on that assumption, an important trust has been committed, should be convicted of slip-shod performance, and be led into a hole-and-corner procedure, which they are afraid to publish.

EDWARD S. PRIOR.

MEDIÆVAL PAINTING.

SIR,—I have uncovered some very curious specimens of the above during restorations—some, some years ago at East Harling, Thetford. The principal one there was on the north wall and divided into four squares; in the lower right-hand square male figures were depicted on their hands and knees, bearing other male figures upon their backs towards a receptacle similar to a modern asphalte-heating apparatus; over this receptacle a gigantic figure, fork in hand, presided. This personage was provided with a tail of respectable dimensions. In one of the upper squares were shown female figures, who were, from their attitudes and surroundings, supposed to be in the enjoyment of heaven.

At Irchester, some two years ago, during restoration there, I, with the assistance of the vicar, uncovered the whole of the east gable of the nave, which had been entirely covered with subjects.

The central figure (which was unfortunately nearly all lost) seemed to have been seated upon a rainbow.

Upon the right of the spectator, and following up the label of the arch, were several figures with a rope dragging a sort of truck, this truck being full of male figures: their destination was plainly in sight and well alight.

On the opposite side were female figures, some perfectly nude, while others emerging from graves

and tombs were tied up, as it were, in sacks, the mouth of the sack or cloth being tied tightly on the crown of the head, a slit in the side allowing the features to be seen. These, together with angels with trumpets near the central figure, made the more pleasant picture of the two.

The Society for the Preservation of Ancient Buildings decided that what was left of this painting must remain exposed.

I suppose at one time such pictures were considered conducive to reverence.

Hersham, Walton-on-Thames. R. RAMM.

*** Our correspondent's description of the paintings would seem to imply that women were regarded in the Middle Ages as the natural occupants of Heaven, and men of the other place. This hardly seems probable, and we should imagine our correspondent's memory has a little misled him as to details.

SIR,—Those who have lately visited that interesting ruin, Kirkstall Abbey, will have come away with the question in their minds, What evil genius prompted Mr. Micklethwaite to have advised the removal of the ivy from the old walls? I am well aware that he is a very great authority on buildings of this nature, but it appears to me he quite ignored two principal points,—(1) the use of ivy on old walls, and (2) the effect such removal would have on walls in a state of decay, both as regards their exposure to the weather and their picturesque appearance, without which a ruin is only a ruin. When a building gets weakened by the decay of stone, and the stones loosened by the decay of their binding material, nature seems to take the matter in hand, and covers it with ivy as a protection from wet and frost, filling up the cavities, binding and strengthening as it goes on, and though decay, of course, proceeds, sudden collapse and occasional disaster are provided against. If Kirkstall Abbey is a specimen of how the Society of Antiquaries will deal with old buildings, the less that Society has to do with them the better. J. W. BENWELL.

25, *Park-square, Leeds.*

The Student's Column.

VENTILATION AND WARMING.—XXII.

DEPERDITION OF HEAT (*continued*).

THE deperdition of heat through walls and other structural enclosures to buildings varies with the temperature of the inner and outer atmospheres, the properties of the material of the structure in respect of conductivity and radiation, as well as with their thickness, their permeability, and the stillness or otherwise of the external atmosphere.

The relation of these factors for a simple vertical wall, leaving out of account for the present its degree of permeability, and the motion of the atmosphere, may be thus expressed:—

$$W = \frac{T - t}{\frac{1}{B+S} + \frac{e}{L} + \frac{1}{B_1+S_1}}$$

where W = the amount of heat lost per unit of area in unit time, T = the temperature of the internal air, t = that of the external air, B and S are the coefficients of conduction to the air and radiation of internal wall surface, as discussed in our last chapter, B_1 and S_1 are the similar coefficients for the external wall surface, e = the thickness of the wall, and L = co-efficient of conductivity of the material of the wall.

If the form and surface of both internal and external faces of the wall are the same $B = B_1$ and $S = S_1$, and we should have

$$W = \frac{T - t}{\frac{2}{B+S} + \frac{e}{L}}$$

The influence of different materials may be thus compared for thin walls, say, half brick in thickness: walls of naked brick or plastered, 2·13; similar walls papered internally, 2·16; sandstone walls, 2·58; limestone walls, 2·76; the wind being supposed not to be active, and permeability not being taken into account.

If the wind is operative for similar walls we should have the comparative figures: For brick or plastered walls, 2·99; if papered, 3·05; sandstone walls, 3·97; limestone walls, 4·39.

As the thickness of the wall increases the conductivity of the material, represented by the factor L, becomes of greater importance. Thus, for walls four bricks, or 3 ft., thick, we should have, in the first case, omitting the action of the wind and the permeability of the material, for brick or plastered walls, 0·63; if papered, the same; sandstone walls, 1·08; limestone walls, 1·36.

Or, taking into account the action of the wind, but not the permeability, brick or plastered walls, 0·69; if papered, the same; sandstone walls, 1·26; limestone walls, 1·67.

The influence of permeability, which is, of course, in practice a vital factor, may be thus compared, taking the thickness of walls as above at four bricks, or 3 ft.: For brick or plastered walls, 0·98; if papered, 0·81; the wind being assumed to be quiescent.

If the wind is acting we have, under similar conditions: For brick or plastered walls, 1·20; if papered, 0·95.

When the wall is constructed of different materials, as, for example, in the case of brick walls with stone facing, it is necessary to take into consideration the conductivity of the various materials; thus our general expression given above becomes

$$W = \frac{T - t}{\frac{1}{B+S} + \frac{e}{L} + \frac{e_1}{L_1} + \frac{1}{B_1+S_1}}$$

where e_1 = the thickness, and L_1 the co-efficient of conductivity of the outer half of the wall, the other factors remaining as before.

For hollow walls with an air-tight space between the inner and outer walls we have

$$W = \frac{T - t}{\frac{1}{B+S} + \frac{e}{L} + \frac{1}{B_1+S_1} + \frac{1}{B_2+S_2} + \frac{e_1}{L_1} + \frac{1}{B_3+S_3}}$$

where B and B_1, S and S_1 are the co-efficients for the two sides of the inner wall; B_2 and B_3, S_2 and S_3, those for the two sides of the outer wall; e and L are the thickness and co-efficient of conductivity of the inner wall and e_1 and L_1 the similar factors for the outer wall.

If, as is usually the case, the form and surfaces of the two walls are alike we should have $B = B_1 = B_2 = B_3$ and $S = S_1 = S_2 = S_3$ and our expression becomes

$$W = \frac{T - t}{\frac{4}{B+S} + \frac{e}{L} + \frac{e_1}{L_1}}$$

From the expressions for the single and hollow walls we can deduce expressions for the loss of heat by windows. Thus in the equation

$$W = \frac{T - t}{\frac{2}{B+S} + \frac{e}{L}}$$ for a single wall, if we

suppose the wall to be very thin so that $l = o$, we have

$$W = \frac{T - t}{\frac{2}{B+S}} = \tfrac{1}{2}(T - t)(B + S)$$

Similarly for double windows from the expression

$$W = \frac{T - t}{\frac{4}{B+S} + \frac{e}{L} + \frac{e_1}{L_1}}$$ if $e = e_1 = o$ we have

$$W = \frac{T - t}{\frac{4}{B+S}} = \tfrac{1}{4}(T - t)(B + S)$$

These expressions take no account of the action of cold wind on the external surface of the glass, which in practice is an important factor, for whereas with single windows the wind will double the loss of heat, with double windows the increase will be only one half of the heat lost in still air.

Thus we may compare the relative advantages of single and double windows by the following figures:—Assuming the loss of heat with double windows in still air as 1, we have that of double windows exposed to wind, $1\frac{1}{2}$; single windows in still air, 2; exposed to wind, 4.

Again, our expressions for loss of heat by windows assume that the whole of the opening is filled by glass. For strict accuracy we should take account of the proportion of the opening filled by the wood or other framework of the window. For windows of different character, different results will ensue; for example, windows with wide wooden sash-bars in small squares, and wide and thick frames, lose less heat than those formed of large sheets of glass in iron frames. The calculation of these is, of course, perfectly simple, though tedious, in practice. We have only to adapt our general expression for a wall given above to the case of the wood or iron framework, as one or other is employed.

The expressions given above for loss of heat through walls and windows may also be readily applied to the calculation of the loss through ceilings, floors, and roofs. As these are usually of complex construction, it will be, of course, necessary to compute the value of $\frac{e}{L}$ for each part of the structure, and to add these together for the sum of the factors thus represented in the expression, which we may call $\Sigma\frac{e}{L}$, and our equation then becomes

$$W = \frac{T - t}{\frac{1}{B+S} + \Sigma\frac{e}{L} + \frac{1}{B_1+S_1}}$$

In the case of floors which have an air-space between the ceiling and floor-boards, the problem is analogous to that of a hollow wall, with a certain portion of the area occupied by the joists, resembling the wall of complex composition.

When dealing with the case of ceilings, it is important to remember that the temperature of the air at the ceiling level is, in the case of heated rooms, higher than the average temperature of the apartment. As a general rule, in heated rooms, it has been found by Schinz that the temperature increases 1 deg. Cent. for every 1·2 mètre in height.

Hence, as the deperdition of heat increases with the difference of temperature of the internal and external surfaces, the loss from the cooling of the upper superfices is greater than from the sides or floor, even if all were of the same material.

Much more is it the case with glass roofs or skylights, especially if single, for we then have only a thin division between the warmest air of the room and the colder atmosphere, while the horizontal or approximately horizontal position causes the B in our original expression, that is the co-efficient of heat conducted to the air, to be at a maximum. Bearing this in mind, we see that a horizontal glass-light loses more heat than an inclined one, and the nearer the inclination approaches to verticality the less will be the deperdition of heat.

In the case of ground floors, and especially of floors laid direct upon the ground, as with concrete and paved floors, it is important to remember that a portion of the heat is spent in warming the ground, to a depth varying with the temperature of the warm air above it, but averaging, we may say, about 18 in.

Deperdition of heat also occurs through the opening and shutting of doors, the extent of which depends, naturally, upon the size of the opening and the difference of temperature on the two sides of the door, and may be thus calculated:—

$W = 0{\cdot}864\ (T - t)\ \sqrt{h_o}$ for open doors, where W = amount of heat lost per second from a door opening 1 mètre wide and 2 mètres high, T and t are the temperatures on each side, h_o is the head or pressure, reduced to freezing-point, of a column of air 1 mètre high, due to the difference of $T - t$.

For the opening and shutting of such a door once, we should have $W = 0{\cdot}288\ (T - t)\ \sqrt{h_o}$.

We thus see that the calculation of the deperdition of heat for any particular building is a somewhat complicated matter, though by careful dissection and patient calculation we can ascertain the number of heat units lost in warming the enclosure, and then proceed to add the amount required for warming the air and the occupants of the room or building. In the case of ventilated buildings we have further to take into account the amount of heat lost by being carried away with the foul or vitiated air. It is useless to attempt to base our practice on simple rules of so many feet of piping for so much cubical capacity of a building without taking account of the factors we have been considering in this chapter.

THE ENGLISH IRON TRADE.—The rapid downfall in the price of Scotch warrants during the past few days has had the effect of weakening prices in most of the pig-iron centres. Middlesbrough pig is 6d. to 9d. lower on the week, and mixed numbers of Bessemer iron in the north-west have declined 1s. Scotch makers' iron is quiet at easier prices generally, but some brands are firmer. Business in pig-iron is very restricted, owing to the uncertainty prevailing as to future prices. There is next to no business doing in the manufactured iron trade, and Staffordshire common bars are quoted 2s. 6d. lower by merchants. Tinplates are dull, and prices are slightly lower. The steel trade is fairly well employed, but the prospects for the future are not encouraging. Orders are very backward in the engineering trade, although works are kept fairly going. Coal is in good demand for most descriptions.—*Iron.*

SURVEYORSHIPS.

ST. HELENS.—The Water Committee of the St. Helens Corporation, in consideration of the extra work in connexion with, and the satisfactory completion of, the additional permanent works at Knowsley and Kirkby, have recommended an increase of the salary of Mr. D. M. F. Gaskin, the Water Engineer, from 400*l.* to 450*l.* per annum, as from the commencement of the present financial year.—*Liverpool Post.*

HEREFORD.—Mr. W. Parker, the Assistant-Surveyor for Hereford, has just accepted an appointment as Superintendent of Roads, Bridges, and Public Buildings in Jamaica. He has been made the recipient of an address from the Hereford Cycling Club, the Hereford Volunteer Corps, and other friends, accompanied by a dressing-case. The presentation was made at a dinner, at which the Mayor (Mr. M. Boycott) presided. The Corporation workmen also presented Mr. Parker with an aneroid barometer. Mr. Parker is the son of the City Surveyor.

OBITUARY.

SIR JOHN HAWKSHAW, F.R.S.—We have to record the death of Sir John Hawkshaw, F.R.S., F.G.S., the eminent engineer, which took place on Tuesday last, in his eighty-first year. According to "Men of the Time," he was born at Leeds in 1811, and educated in that town. He was placed at an early age as a pupil with Mr. Charles Fowler, then engaged in the construction of turnpike roads in various parts of the West Riding. A more famous engineer, Mr. Alexander Nimmo, was young Hawkshaw's next instructor. His death in 1831 threw his pupil on his own resources, and, though only twenty years of age, he undertook the management of the Bolivar copper mines, in South America—a post which he occupied for three years. On his return to England, Mr. Hawkshaw became Engineer to the Manchester and Bolton Canal and Railway, and soon afterwards to the Lancashire and Yorkshire Railway, reconstructing nearly the whole of their system. Mr. Hawkshaw was nominated one of the Metropolitan Commissioners of Sewers, when that body was reformed by the Crown, and in 1860 he was appointed Royal Commissioner to decide between rival schemes for the water-supply of Dublin. Among other achievements may be mentioned the success with which he remedied the disastrous effects of the failure of the great sluice of St. Germains, in Norfolk, in 1862. He was President of the Institution of Civil Engineers in 1862-63; he received the honour of knighthood in 1873, and was President of the British Association at the Bristol meeting in 1875. The Penarth Harbour and Dock in Cardiff Roads, the Londonderry Bridge, the line of railway between Charing-cross and Cannon-street, with the two bridges across the Thames, the East London Railway, the Albert Dock at Hull, the South Dock of the East and West India Company, and the foundation of the new forts at Spithead, are among Sir J. Hawkshaw's many works at home; while of those which he constructed abroad, the most considerable are the Riga and Dünaburg and the Dünaburg and Witepsk railways in Russia, the Government railways in Mauritius, and the great ship-canal from Amsterdam to the North Sea.

GENERAL BUILDING NEWS.

RESTORATION OF KIRK HAMMERTON CHURCH, YORK.—The Church of St. John the Baptist, Kirk Hammerton, was re-opened and consecrated on the 19th ult., after restoration and enlargement. Prior to the work just completed the church consisted of a western tower, nave, and chancel, with a north aisle to the nave, and a transeptal projection on the north of the chancel. The tower, nave, and chancel, says the *Yorkshire Herald*, are undoubtedly Saxon. They have been carefully preserved, with as little renovation as was possible. The tower is a simple unbuttressed structure, square externally, with a rude but remarkable western doorway, and then carried up perfectly plainly to the belfry stage, which has a window in each face, divided into two lights by a mid wall shaft. The nave measures 21 ft. by 13 ft. 6 in. internally. The chancel, opening from the nave by a narrow semi-circular arch of two orders, is 16 ft. by 11 ft. In the south wall of the nave are two doorways, one built up, the other being the main entrance to the church. Half of it had been cut away for a modern square-headed doorway, but this latter has now been removed and the old doorway repaired. The chancel retains some of the original side-windows, as well as some later ones. The Saxon masonry of the church is principally of large regularly-shaped blocks of stone. The north side of the nave had been renewed in the thirteenth century, and an arcade of two arches erected, opening into a very narrow aisle. The altar is raised above the nave, and has a constructional retable behind it. The old chancel retains its original Jacobean altar and altar-rails, and has an oak credos made up of several carved panels, mostly Dutch work, given by Mr. Stanyforth. The church is lighted with gas, the gas-fittings having been specially designed for it. An old lych-gate, on a stone base, is in course of erection on the south entrance of the churchyard. Mr. Keswick, of York, has been the contractor, Mr. Milburn doing the carving, and Mr. Laidler, of Durham, the ornamental brass and ironwork; and the restorations have been carried out under the superintendence of Mr. Geo. Clark, the clerk of the works, from the designs of Mr. C. Hodgson Fowler, F.S.A., of Durham. The total cost of the work is 2,590*l.*

ALTERATIONS TO THE COUNTY HOTEL, CARLISLE.—During the past six months various alterations have been made to the County Hotel, Carlisle. The old coffee-room had been found very inadequate, and, therefore, an extension has been made on to the open ground between the hotel and the station by the formation of three double bay windows carried from the basement. The old plain coffee-room has been altered into a dining-hall, fitted throughout with French-polished mahogany. A frieze in tinted gold ornament and vellum-coloured ground has been used all round, and the walls below are covered with Tynecastle tapestry. The ceilings are laid out in a geometrical design with Robinson's cement painted an ivory colour, the moulded ribs and cornices being painted in colours and gilded. Two mahogany mantelpieces have been fitted up at each fireplace, and the fireplace openings have been formed with special tiles and the old-fashioned dog-grates set in them with marble fenders all round. The architect was Mr. T. Taylor Scott, of Carlisle; and the builders were Messrs. Beaty Brothers.

RENOVATION OF BIRMINGHAM TOWN HALL.—The Estates Committee of the City Council have let the contract for the structural alterations in the interior of the town-hall to Messrs. W. & J. Webb, of Birmingham. The contract for the heating apparatus has been given to Mr. Wilson W. Phipson, of London. The architects are Messrs. Cossens & Peacock.

NEW VICARAGE, WAUNEVEN, SOUTH WALES.—The memorial-stone of the vicarage was laid on the 21st ult. The site of the vicarage is on elevated ground, facing Brynmelin Park, and having an extensive view of Swansea Bay. The building is to be built of native stone, dressed quoins, and the roof covered with slates. The front entrance doorway is in box ground stone. On the ground-floor accommodation is provided for a dining-room, drawing-room, study, kitchen, and offices, with hall. On the first floor accommodation is provided for five bedrooms, dressing-room, and a bath-room. The plans have been designed by Messrs. J. Buckley Wilson, F.R.I.B.A., and Glendinning Moxham, architects, of Swansea. The contract is let to Messrs. Gustavus Bros., contractors, Swansea.

PROPOSED NEW STEAM LAUNDRY AT PENGE.—The London and Provincial Steam Laundry Company have instructed their architect, Mr. Ernest Turner, to prepare plans for their third large steam laundry. The building will be erected on a freehold site near the Penge station on the L. C. and D. Railway.

MISSION HALL, WINDSOR, LANCASHIRE.—On the 14th ult., the new St. Clement's Mission Hall, Windsor, was formally opened by the Bishop of the diocese. The building consists of large hall, 60 ft. by 40 ft., with raised platform at one end in an alcove, with the necessary vestries, yard, and conveniences. It is Gothic in design, with open timber roof, stained and varnished. The hall is entered from Longfellow-street by wide folding doors, through a tiled vestibule, and is capable of seating about 400 people. In the basement are the kitchen and heating apparatus room. The front elevation is built of red Ruabon bricks, with Cefn stone dressings, and the windows are filled in with lead-light glazing. The contractors were Messrs. Raffles & Campbell, of Liverpool, the heating apparatus being supplied by Messrs. King & Co., the gas-fittings by Messrs. Dodd & Oulton, the lead-light glazing by Messrs. Wilkinson, and the whole executed from the designs and under the superintendence of the architect, Mr. J. H. Havelock Sutton, of Liverpool.

BOARD SCHOOL, SHEFFIELD.—On the 25th ult. Mrs. Wycliffe Wilson opened a new Board School in Carlisle-street East, Sheffield. The building is two stories high; the ground-floor will be used by girls and the upper division by boys. On each floor are two large apartments and four class-rooms, with cloak and all other necessary rooms. The class-rooms are divided from the main school by glazed partitions. The internal fittings throughout are of pitch-pine, stained and varnished; the corridors and staircases are lined with glazed bricks to a height of 5 ft. The building is heated by hot water on the low-pressure system, and ventilation is secured by means of air-pumps. Each playground contains a covered shed. The architecture is of the Elizabethan period. The designs were prepared by Mr. Hodgson, and the works carried out under the superintendence of Mr. J. E. Benton, of Sheffield. Messrs. Lowe & Sons, of Burton-on-Trent, carried out the general work; Messrs. J. C. & J. S. Ellis provided the heating apparatus and staircase railings; Mr. John Laidler was clerk of the works.

NEW RAILWAY STATION HOTEL AT ABERDEEN.—The Great North of Scotland Railway Company, who recently purchased the Palace Hotel, Aberdeen, at a cost of 30,000*l.*, have commenced the remodelling of the building in order to convert it into a station hotel. On the basement floor there will be an access from the centre platform, extended to nearly Union Bridge, by means of a gangway. On this floor provision is made for a reception-room at the foot of the passenger lift, and the latter will land the guests in the vestibule of the hotel. The vestibule will be lighted by a stained glass window, the walls lined with marble, and the floor with mosaic work. The new staircase will be of white marble, with a rail of wrought brass work, and glass dome in the roof overhead. The rest of the improvements consist chiefly of shifting the stock-rooms, at present facing Bridge-street, to the side next the railway, and placing the bedrooms next Bridge-street, in order that the noise from the railway may be avoided. All the bedrooms, over fifty in number, are to have double windows. The whole of the building will be lighted with electricity, and heated and ventilated by mechanical process upon Key's principle. The rooms are also to be redecorated. Messrs. Matthews & Mackenzie, of Aberdeen, are the architects, and the improvements will cost about 5,000*l.*

SCHOOLHOUSE, ALL SAINTS' CHURCH, BELFAST.—A new schoolhouse, in connexion with All Saints' Church, Belfast, was opened on the 23rd ult. The new schoolhouse, which is situated in University-street, has a frontage of 46 ft. towards that street, and an average depth of 130 ft. The buildings are constructed of red perforated bricks, with white stone dressings. The roof is covered by selected slates and terra-cotta cresting. A bellcot terminates the front elevation. The internal woodwork is of pitch-pine, varnished, and the windows are fitted with lead-lights in various tints. The principal schoolroom is 70 ft. by 28 ft., an infants' room being divided therefrom by means of a revolving shutter. The contract has been carried out by Mr. Thomas M'Millan, builder, Belfast, from the plans and under the superintendence of Mr. Henry Seaver, architect, of Belfast.

PRIMITIVE METHODIST CHAPEL, DONCASTER.—A new Primitive Methodist Chapel was opened at Doncaster on the 28th ult. The premises comprise a chapel, frontiug on Carr House-road, a small school-room behind, and minister's vestry, with a caretaker's residence in the rear. The chapel is of brick, with stone dressings, and mouldings of red brick. It is surrounded by an open space, and there are two entrances. Accommodation is provided for 400 people, on open benches. The fittings are of pitch-pine, with mahogany communion-rail. A platform has been erected instead of a pulpit. Behind the rostrum is the organ and choir loit, with two vestries. The school-room is small, but there is room for its extension. The organ and choir loft is reached by a staircase from the school-room. The windows are glazed with leaded lights. The plans were supplied by Mr. J. Simmons, of the firm of Messrs. Brundell, Simmons, & Brundell, and Messrs. Sprakes & Son are the builders. The cost of the new chapel, including the site, will be about 1,450*l.*

PRESBYTERIAN CHURCH, BRIDGE OF WEIR, N.B.—The memorial stone of the new U.P. Church at Bridge of Weir, Renfrewshire, was laid on the 23rd ult. by Mr. John Bonar, of Greenock. The building is situated on the Ranfurly estate, and the side elevation faces Prieston-road, and the front is to Ranfurly-place. The style of architecture is Gothic of the Early Decorated period. The front to Ranfurly-place has a central gable, flanked by buttresses, with moulded weatherings. The lower portion between the buttresses is occupied by two mullioned and traceried windows, the wall space between the windows having cusped and moulded panelling. Over this lower stage is a large five-light window, with moulded jambs and arch filled with tracery. A band of cusped panelling relieves the upper part of the gable, which is terminated by a carved foliated cross. At the side of the gable is a porch, which forms the principal entrance to the church, and is finished inside in polished stone-work. The entrance archway will be moulded and carved, and will be fitted with wrought-iron gates. Behind the porch, in an octagonal turret, with moulded and panelled arcading in the upper portion, is the staircase to the church gallery. The side elevations show a series of cusped-headed single windows, placed between buttresses, and the organ-chamber transept has a cusped arcading between the narrow windows. At the west end the vestry, session-house, and hall are grouped together. The church is being built of red sandstone from Ballochmyle quarries, and will be roofed with light sea-green slates with red ridges. Internally the building is cruciform in shape, having a wide nave with shallow transepts, one of which forms the organ chamber. The seating is divided into centre and side aisles, and the pulpit is placed on an open platform, in front of which the choir will be seated on a lower level. The roof is semi-octagonal in form, with arched main couples springing from moulded stone corbels on the side walls, and the whole ceiling between the main couples is filled in with timber panelling. The pulpit is placed under a moulded stone arch carried on moulded pillars, and the transepts have stone arches dividing them from the church. The lower walls will be lined with wood up to the window sills, above that to the springing of the roof with tinted plaster. The windows are to be glazed with antique glass. The present sitting

accommodation proposed is for 400 persons, in area only, but provision has also been made for the future erection of an end gallery, which would add another 100 sittings. There are also a session-house and ladies'-room, which can be opened into one room, a class-room, and a vestry. The building will cost about 2,500*l*. The church has been designed by Mr. John B. Wilson, A.R.I.B.A., Glasgow.

EXTENSION OF CONVALESCENT HOME, PORTHCAWL.—It is intended to extend "The Rest" Convalescent Home, Porthcawl, Glamorganshire, to provide accommodation for forty female patients. The additions include the doubling of the dining-room, which will then measure 40 ft. by 24 ft., and in addition to the master's and matron's rooms, there will be two large day-rooms and seven dormitories, together with the usual offices, laundries, and storage-rooms, stable and coach-house. There will also be a stone staircase and several corridors. The style of the new building is to be carried out in conformity with the present structure. The building will be erected from stone quarried near the site, and the inner part will be lined with bricks. The ceilings are to be of open or framed timber. A water tower will be provided on the new building, in which a tank will be placed to hold three or four days' supply. The architect under whose supervision the work is being carried out, is Mr. George F. Lambert, Bridgend, while the work has been entrusted to Mr. John D. Williams, Knighton, Radnorshire. The estimated cost is 4,475*l*.

SANITARY AND ENGINEERING NEWS.

INSTITUTION OF CIVIL ENGINEERS.—At the first meeting of the newly-elected Council of the Institution of Civil Engineers, the following officers were re-appointed:—Dr. H. L. Antrobus, as treasurer; Dr. W. Pole, F.R.S., honorary secretary; and Mr. James Forrest, secretary.

SEWERAGE WORKS, CROSBY, LANCASHIRE.—Major C. Phipps Carey, R.E., Local Government Board Inspector, held an inquiry at the offices of the Crosby Local Board, on the 27th ult., with reference to an application to the Local Government Board from the Crosby Local Board to borrow 7,540*l*. for works of sewerage and street improvement.

WATERWORKS EXTENSION AT HEYWOOD.—The report of the Borough Engineer for Heywood for the past year states that the enlarging of the reservoir at Nayden, and the making of the Clay-lane reservoir will give an additional storage capacity capable of affording a supply of 1,000,000 gallons per day, a quantity amply sufficient to meet the domestic requirements of a population of 50,000 during the greatest drought. The total expenditure on the works is 74,390*l*. 15s. 7d. The deficiency on the year's working is 1,770*l*. 18s. 5d.—*Manchester Courier*.

THE PROPOSED CANAL FROM THE TYNE TO THE SOLWAY.—It is stated that the proposal to construct a canal between the Tyne and the Solway is again revived. The suggested route has been surveyed by a London engineer with a view to the formation of the company to float the scheme; and the result of the survey is that, according to him, there are only two or three places throughout the entire distance where any serious difficulty in construction would occur. If the project should be carried out, the canal would follow the course of the river Tyne from Tynemouth to Hexham, a distance of 32 miles, and from Hexham to Haltwhistle, along the valley of the South Tyne. Between Haltwhistle and Gilsland a cutting would connect the waterway with the valley of the Irthing, which the canal would follow to the confluence of that river with the Eden, near Warwick Bridge. Docks would be erected at Carlisle; and the canal would be continued from that place to the Solway, either by way of the valley of the Eden to Port Carlisle, or by another route which would have its terminus at Maryport. The canal would have a depth of 15 ft.

NEW WATERWORKS, St. HELENS, LANCASHIRE.—On the 21st ult., the Mayor of St. Helens (Councillor Edward Johnson) started the new engine at the Kirkby new waterworks, belonging to the St. Helens Corporation. The ceremony completed a scheme which was inaugurated in 1882 for the purpose of procuring an additional water supply for the largely increasing borough of St. Helens. An application was made to Parliament for powers to borrow 95,000*l*., and the Royal assent having been given to the undertaking, the first sod of the Knowsley works was cut by the Mayor (Councillor Richard Pilkington) on October 28, 1882. Two wells were sunk to a depth of 170 ft., and connected by a driftway 22 ft. by 6 ft. Boreholes were also made in the same wells to an additional depth of over 500 ft. A plentiful supply of water was found, the average yield being 1,500,000 gallons per twenty-four hours, the bulk of which is obtained at a depth of 476 ft. from the surface. Engine-houses were erected in the Scottish Baronial style, and a powerful engine was erected with all necessary apparatus for raising the water and conveying it to the Brown Edge reservoir at Thatto Heath. The cost of the Knowsley works was 20,248*l*. On June 11, 1886, the first sod of the Kirkby works was cut by Alderman M'Bryde. Two wells similar to those at Knowsley have been sunk by Mr. Villiers, contractor, of Beverley, the wells and borehole being of a total depth of 510 ft. The engine-house, which is 48 ft. wide each way, consists of an octagonal tower rising 80 ft. above the ground line, with a smaller tower rising 30 ft. higher. The base is surrounded by a castellated terrace 12 ft. high, and inside there is a new engine erected by Messrs. R. Daglish & Co., engineers, St. Helens. It is calculated to raise when in ordinary work 1,500,000 gallons in twenty-four hours. There are two boilers 28 ft. by 7 ft., in a house corresponding in style of architecture to the tower. The cost of the engine and boilers has been 5,990*l*. The total cost of the Kirkby works has been 18,621*l*. In addition to the cost of the Knowsley and Kirkby stations, the mains to St. Helens have cost 18,244*l*., the compensation mains 2,593*l*., and parliamentary charges 63,655*l*. The whole of the work has been designed and carried out under the supervision of Mr. D. M. F. Gaskin, M.Inst.C.E.

COMPLETION OF PAISLEY WATER-WORKS.—The Paisley Town Council, as Water Commissioners, completed on the 26th ult. their extensive water scheme for Paisley by formally inaugurating the extension of the Camphill Reservoir. Ten years since the Paisley Town Council resolved to carry out a scheme which would not only meet the wants of the town, but provide a supply for many years to come. The whole question was remitted to Messrs. Leslie & Reid, consulting engineers, Edinburgh, who decided to recommend the Rye water district, where a drainage area could be had of over 4,000 acres. The recommendation of the engineers was adopted, and the Paisley authorities promoted a Bill to take in the Rye water, a tributary of the Garnock, which flows into the sea at Irvine. To this scheme Parliament gave its sanction. One of its principal features was the construction of a reservoir on the Rye water, in the parish of Largs, on the road from Kilbirnie to Largs, at a height of 615 ft. above sea level. The Act also included the construction of a new reservoir at Barcraigs, near Rowbank, to hold 300,000,000 gallons. Between Rowbank and the Rye a pipe 2 ft. in diameter was laid a few years ago, and has since been in operation. When in course of construction the embankment of the Camphill Reservoir at the Rye was made only 45 ft. high, instead of 70 ft., as was originally intended. But as the quantity of water obtained was still considered insufficient, it was decided to proceed with the completion of the reservoir in accordance with the original plans. The embankment across the Rye is now 75 ft. high, and the storage capacity of the reservoir is 700,000,000 gallons, instead of 180,000,000 gallons before the extension, whilst the area flooded is now 120 acres, as against 40 acres in extent. The length of the reservoir is about one mile and a quarter. The embankment is 1,450 ft. in length, with a height of 78 ft., the head above high water mark being 8 ft. It is puddled in the usual way, the puddle wall being founded on trap rock of the district. The waste weir is composed of blocks of granite, set in concrete, and constructed so as to form a cascade of steps 25 ft. high, over which the water falls. From the deep water at the foot of the embankment a square tower rises, and through it the water is drawn into a brickwork tunnel, and between the top of the embankment and the tower is a iron bowstring bridge. On the side of the turnpike road above the embankment a keeper's house has been erected, and also a large room for the use of the Commissioners. The gathering ground of the district is to a large extent hill ground of a pastoral nature, and the rainfall of the district is between 50 and 60 in. in the year. The hills are mostly trap of the old red sandstone period, and lie near the surface. The least supply that will be derived in dry years from the enlarged reservoir at Camphill will be 3,000,000 gallons per day, but a pipe has been put in capable of carrying 6,000,000, so that when there is surplus water at Camphill it can be run into the various other reservoirs belonging to the Commissioners.

SANITARY SPECIALTIES IN FIRE-CLAY.—We have received from Mr. T. W. Twyford, of the "Cliffe Vale" pottery, Stoke-on-Trent, his new catalogue of sanitary specialties manufactured in "Cliffe Vale" fireclay. The catalogue includes sinks, wash-tubs, trough closets and latrines, lavatories, urinals, grease-traps, &c. The catalogue is very well got-up and illustrated. Among the items in it worth special mention are the "Ideal" combination fire-clay enamelled sinks, the "combination" consisting of sink, fluted drainer, soap-tray, &c. The fireclay enamelled wash-tubs for public and private wash-houses and laundries leave nothing to be desired; they can be fixed in ranges of any desired length. The latrines, with automatic flushing arrangement, are very suitable for schools, public institutions, and factories. The urinal ranges figured in the catalogue are also very good. Various forms of waterclosets are shown, including "The Deluge" and the "Delpha"; these can be used also as urinals and slop-sinks. Lastly, we may call attention to the "Deluge" patent grease-trap, which is flushed at periodic intervals by an automatic flushing cistern; it is self-cleansing, thereby doing away with the offensive operation of removing the grease from the old type of trap; it is self-contained, and easily got at for examination; it can be easily ventilated; and it has no metal parts. Altogether the catalogue is one well worthy of the attention of architects, sanitary engineers, and builders.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, IBROX CHURCH, GLASGOW.—A stained-glass memorial window has just been placed in the north-west corner of Ibrox U.P. Church in memory of the late Dr. Leckie. The subject, designed by Mr. Hay (of Messrs. Bruce & Hay), architect, represents Christ as the Good Shepherd. The window was subscribed for by the congregation, and is the work of Messrs. W. & J. J. Keir, of Glasgow.

DECORATION OF PORTOBELLO PARISH CHURCH.—The interior of this church has been entirely repainted and decorated. The ceilings are painted a pale soft blue tone, and the enrichments of the cornices and centre-pieces have been treated in shades of creams and yellows, deepening into tones of brown. The walls are of a primrose hue, and the lining all around has been surmounted with a coloured band in brown and pale terra-cotta; while the ingoings of windows are relieved with blue lines. The wall at the pulpit has been decorated with a series of panels with ornament in browns and reds. The columns are in shades of peacock-blue and decorated. The decorators were Messrs. Geo. Dobie & Son, Edinburgh.

FOREIGN AND COLONIAL.

ATHENS.—The agreement which has been signed between Greece and France regarding the excavations at Delphi was published in the official gazette of the 19th ult. According to this agreement, France will have the sole right of making excavations at Delphi, and will be responsible for all costs; the Greek Government, however, promising to contribute 60,000 drachmes towards them. The excavations are to be carried out under the superintendence of the Curator-General of Antiquities, together with the Director of the French School at Athens. The sites on which the excavations are to be carried out remains the property of the Greek Government, as also with every piece of work discovered. France will have the sole right of taking casts and making illustrated publications of the excavations for five years.

BERLIN.—The amalgamated societies of German architects and civil engineers have received an invitation from the Italian Architectural Society, begging them to take part in the great meeting they intend holding at Palermo this autumn in connexion with the National Exhibition.——The large fountain which is to be placed on the "Schlossplatz" in front of the Imperial Palace, a present from the municipal authorities to the reigning Emperor, in honour of his ascending the throne, is to be put up this year, the bronze parts now being ready, and the foundation work having been taken in hand. The sculpture on this fountain has been designed by Reinhold Begas.——The municipal authorities intend building some new public baths at a cost of some 25,000*l*.——The Berlin Aquarium has lately opened a receiving-station at Rovigno, on the Adriatic; this station is to be adapted for scientific purposes, and has been supplied with the most modern apparatus for the numerous studies, and laboratories built in the grounds.——The neighbouring town, Spandau, is to have an electric tramway scheme carried out this year.——The foundation-stone to the proposed Kyffhäuser Monument to the deceased Emperor, William I., is to be laid with great pomp by the reigning Emperor on October 18.

BRUSSELS: THE HOUSING OF THE WORKING CLASSES.—A Dalziel telegram from Brussels, published in Wednesday's *Times*, says that the results of the official inquiry into the condition of the dwellings of the working classes, ordered last year, have just been published. According to the return, there were in Brussels on Dec. 31, 1890, 49,619 families, of which 19,284 were the families of workmen. The number of houses in the city was 19,594, inhabited by 168,168 persons. These figures have regard to the city itself apart from the suburbs, which alone number nearly 300,000 inhabitants. The city of Brussels numbers 4,601 houses inhabited by the working classes, 105 common lodging-houses, and 3,436 places of business. The rent of a room for a workman averages 11f. 68c. a month. The average daily wage of a working man is 3f. 14c. The income of a working man apart from his daily wage is *nil*. Some few workmen's families enjoy an income apart from wage earnings. This income averages 84c. a day. Of the 19,284 working-class families in Brussels, 10,462 have occasional recourse to public charity, while 8,822 are independent of such aid. Brussels numbers in all 139 benefit societies. Of working-class families 491 occupy an entire house, 1,371 occupy three rooms, 8,058 have but two rooms, and 6,978 have to be content with only one; 2,186 families lodge in garrets, 1,200 in cellars. The returns also show that in 1,511 cases a family of five persons live in a single room. The volume of air contained in the largest room of a workman's house was found to be 369 cubic

mètres, while the volume of air in the smallest room was 8 cubic mètres. Of the 19,284 working-class families enumerated, 17,626 showed cleanliness in their abodes; in 1,658 cases the rooms were dirty; 2,895 families inhabit but one room apiece, in which they "live, boys and girls, pell-mell." In 406 of these families the boys and girls sleep in the same bed. It is hoped that the law relative to working-class dwellings recently passed by the Chambers, and the measures taken by the Government in relation thereto, will do much to raise the condition of the dwellings of the working classes.

COLOGNE. — Following the example of their Austrian colleagues regarding the proposed erection of a monument to the late F. von Schmidt, the architects of this city, together with some art friends, have elected a committee for the purpose of collecting funds for the erection of some smaller memorial to his memory in their city, proposing that such memorial should be placed in close proximity to the Herz-Jesu-Kirche, one of the best pieces of work carried out from Schmidt's designs. —*Deutsche Bauzeitung.*

SWEDEN AND NORWAY.—The committee charged with deciding upon the designs and plans for the great new opera house, having finally adopted them, they have been sent to the Swedish Ministry of the Interior for approval. The plans adopted show a building differing from the former by its having a central axis with parallel sides, irrespective of the irregular and somewhat awkward shape of the site. Thus the new house to be built on the site of the present one will retain the principal entrance as facing the Square of Gustavus Adolphus, whilst running eastwards a low terrace will be constructed, intended for a grand café, with the necessary offices. In order to hide the irregular line towards the centre of the Square of Charles XII., the ground here has also been given an irregular slope, which will be planted with trees, shrubs, &c. As regards the building itself, it is considered that it will be found to answer all demands as to convenience and safety.——The Building Commission of Christiania has accepted the design and plans of Herr Nordan, a prominent architect, for the re-building and enlargement of the chief post-office.

LEIPSIC.—The large municipal covered market is now complete, and was opened on the 1st inst. The group of buildings, covering a site of 8,715 square mètres, contains 1,000 salemen's stalls within its walls. The work was carried out according to the designs and under the superintendence of the City Architect, Herr Hugo Licht. The site cost the authorities 1,601,500 marks, the erection of the buildings 1,765,000 marks, and the fittings 35,760 marks, together about 172,500*l.*

MARIENBURG (EAST PRUSSIA).—The works of restoration at this historical old castle are making a rapid advance this summer, thanks to funds being plentiful and to the able management of the architect in charge, Herr Landbauinspector Steinbrecht. The funds have (as stated in a former number) been raised partly by a Government grant and partly by the usual German mode of arranging public lottories for the patriotic cause. Up to the present time the Government has voted 270,000 marks, and the lotteries have obtained a clear 1,800,000 marks, making a total of over 100,000*l.*, which large sum will, however, not cover the cost of all the work intended.

MISCELLANEOUS.

THE OFFICE OF CITY ARCHITECT.—At the meeting of the Court of Common Council on the 26th ult., the Town Clerk read a letter from the brother of the late City Architect announcing the death of Mr. Peebles. It was moved by Mr. Purssell that the letter should be referred to the Officers and Clerks' Committee for them to consider and report upon the emoluments of the office in the ordinary way. Mr. Hicks said as there was, he was happy to say, no prospect of the Corporation indulging in large public buildings, he would move that a reference should go to the Committee as to the desirability in the future of appointing a surveyor instead of a City Architect. Mr. Hicks' amendment having been negatived, it was resolved to refer the letter to the Officers and Clerks' Committee, and that the names of the Chairman of the City Lands Committee and the Chairman of the Bridge House Estates Committee should be added to it for this purpose. It was further decided to direct Mr. Murray, the principal clerk in the Architect's office, to carry out the duties as Architect until further orders. Among rumoured candidates for the office, we hear the names mentioned of Mr. Charles Barry, Mr. Arthur J. Gale, and Mr. F. Hammond.

PROPERTIES FOR SALE.—Brownsea, or Branksea, Island, in Studland Bay, belonging to the late Right Honourable G. A. F. Cavendish-Bentinck, M.P. The estate extends over about 800 acres, extensively planted with Scotch fir. The castle was originally built early in the sixteenth century for defence of Poole harbour. The island, about five miles in circumference, contains pottery works and some valuable clay beds. We have read that some of the old wood-work in St. Mary's church here was taken from Crosby Hall, London, which was restored in 1832-40. At the Mart, on June 18, the sporting estates of Upper and Lower Foyers, in Inverness-shire, with residences at Garrogy, by the northern end of Loch Killin, and at Wester Aberchalder. The estates, being about 12,500 and 7,800 acres respectively, and for the most part moorland, will, in the first instance, be offered together, and then as a whole. Within the latter are the two celebrated Falls of Foyers, by the southern end of Loch Ness—and Glen Forsa, in the island of Mull, consisting of 16,650 acres, well stocked with game and deer, yielding a net rental of about 1,875*l.* a year, and lying between Lake Ba and Loch-na-Keah. On July 7, Farleigh Castle, in the north-east of Somerset, near to Trowbridge, where George Crabbe, the poet, was rector for eighteen years. This property, being of 1,300 acres in all, will be put up in ten lots. The old castle was the seat of the Hungerford family; under an arch in the chapel nave is an altar-tomb of Thomas, Lord Hungerford, with effigies of him and his wife. He was elected Speaker of the House of Commons in 51st Edward III., and died in the year 1398. On June 17, the Chimes, in West End-lane, Kilburn, designed by Edward Pugin for the late J. R. Herbert, R.A.; and Horton Manor, Epsom, with 1,060 acres under cultivation, the house was altered and enlarged under direction of the late Sir G. G. Scott, R.A.

THE PATENT OFFICE.—Mr. Henry Reader Lack, Comptroller-General, upon whom the Queen has just conferred the honour of knighthood, was formerly chief of the Statistical Department, Board of Trade, where he joined in 1847. In 1875 he was appointed Registrar of Trade Marks, at the office opened in Quality-court, Chancery-lane, on January 1, 1876. Upon Mr. B. Woodcroft's resignation shortly afterwards, he was nominated clerk to the Commissioners of Patents for Inventions. Mr. Chamberlain's Act of 1883 abolished the Commission, and handed over the Patent Office, together with the Registry, to the Board of Trade, who nominated Mr. Lack as Comptroller. The registrarship of Trade Marks and Designs is now held by Mr. Ralph Griffin, of the Inner Temple, barrister-at-law, in succession to Mr. J. Lowry-Whittle, author of a recent official report upon profit-sharing. A beginning for the new Patent Office buildings has been made by the pulling down of some houses, with gardens, along the northern side of Took's-court, between Furnival-street and Chancery-lane.

FRONTIER RAILWAYS IN INDIA.—The portion of the frontier railway between Kuudian and Kalabagh is almost ready, and will probably be opened for traffic in September next. As soon as the line is opened the traffic in salt and alum will rapidly develop. It is not, however, on commercial grounds that the utility of this frontier line, which is being so quietly pushed to completion, strikes the eye of any one who glances at the map of India. A direct railway from "Attock on the Indus," to Karachi on the sea, with junctions and branch lines at Khushalgarh (from Rawalpindi), Kundwan (from Lala Musa and Sialkot), Dera Ghazi Khan (from Lahore and the Bombay and Central Indian systems), and Ruk (from Quetta) makes the dream of our frontier railway system almost complete. To this must, however, now be added the extension *viâ* Abbottabad into Kashmir, and the Zhob Valley Branch, giving an alternative route to Quetta. If this should join the North-Western Railway at Dera Ghazi Khan, and if the latter system is shortened as has been recommended by a chord line from Delhi, *viâ* Hissar and Sirsa to Bahawalpur, the system will be complete enough to rest upon. — *Indian Engineer.*

THE SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS.—The fourteenth annual meeting of this Society is announced to be held in the old hall of Barnard's Inn, Holborn, on Wednesday evening next, Mr. Philip Webb in the chair. A paper will be read by Professor W. B. Richmond, A.R.A.

THE SKY SIGNS BILL.—The London County Council Sky Signs Bill has been passed by a House of Lords Committee in practically the same shape as approved by a Committee of the House of Commons.

SUBSIDENCES IN CHESHIRE. — The property-owners in the salt districts have lost no time in replying to the arguments of the Salt Union, referred to in our last issue (p. 440) *ante*, respecting the Brine Pumping Bill. The main contentions of the Union are that the Bill alters the common law of England with regard to underground water, and that subsidences would take place through natural causes even if brine-pumping ceased. To these arguments the property-owners reply,—first, that it is within the province and the duty of Parliament to alter the common law where it works injustice, and that it has been discharging this duty from time immemorial. Moreover, this is not an ordinary question of underground water, but of the use of underground water to abstract the strata of rock-salt without paying for them and without regard to the consequences. The brine-pumpers, it is further pointed out, do not want the water, but pump it for the sake of the salt it contains in solution, and, having brought it to the surface, they evaporate it, and so get the salt. As to the second contention, they observe that it is notorious that the subsidences are in proportion to the pumping, and that as brine-pumping increases so does the loss to property-owners by subsidence. If brine-pumping ceased, they maintain, the old excavations and workings would fill up with water, and a support would thus be afforded to the surface as stable as before the vacuum by brine-pumping was caused. Therefore to compare gradual geological subsidences, extending over centuries, with the artificial effects produced by brine-pumping, which are to be seen in the towns of Northwich, Winsford, and Droitwich, is misleading. Under these circumstances, the property-owners, while having no fear as to passing the Bill eventually, protest against being obliged to incur further expense in the House of Lords, especially as they tendered ample evidence before the Commons' Committee, which was not rebutted. They are endeavouring to get the Bill treated in the House of Lords as an ordinary public Bill, and passed without being referred to a Lords' Committee to be fought over again.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Town-hall, Westminster, on Monday evening last, June 1, 1891, Mr. W. N. Colam, President, in the chair, a paper was read by Mr. John Kerr on "Portable and Pioneer Railways." The author commenced by drawing attention to the important part railways have played in the advance of civilisation. He disclaimed any intention of entering into the debatable ground of narrow *versus* broad gauge railways, but dealt with railways suitable to meet the requirements of factory, mine, plantation, or for an absolutely new and undeveloped country. The advantages of a portable railway where facility of transport is of importance was dealt with, and the practical application illustrated by an example in dealing with earthworks was given. The construction and materials used for a portable railway and rolling stock were next touched upon. The author strongly recommended, for the development of the newly-acquired territories in Africa, the adoption of pioneer railways, and described the class of railway recommended, and gave particulars of the cost and construction and carrying powers. Reference was made by the author to Pioneer lines having paved the way for a main line railway; they could be removed further a-field, or be used as feeders for the main line, and that it was better to have a pioneer railway than no railway. On the other hand, he contended that it would be foolish to put down a pioneer railway where the traffic would warrant the construction of a heavy line. The paper concluded with reference to India as a field where there was much scope for the construction of pioneer lines.

CAPITAL AND LABOUR.

THE LOCK-OUT OF CARPENTERS AND JOINERS IN LONDON.—Notwithstanding statements to the contrary in some of the daily journals, the position of affairs in the building trade remains practically unchanged. We are assured that there is no truth in the statement that any of the firms who locked out have opened their works again. The number of firms that are known to the Central Association of Master Builders as having locked out their men is nearly double that stated in the *Daily Chronicle* of Thursday (31), and is being added to daily. The number of men affected by the strike, *i.e.*, drawn out, locked out, and discharged is stated to be over 6,000 men. From all we can gather, neither masters nor men show the slightest indication of giving way. It is stated that a few Dutch carpenters have been imported, and that a score of the London men have found work at Belfast, but there is no perceptible amelioration of the situation. The crisis is now approaching the end of its second week.

THE JOINERS' AND MASONS' DISPUTE AT ST. HELENS.—The *Liverpool Daily Post* of Wednesday reports that a deputation of six, appointed by the joiners of St. Helens,—who, to the number of about 200, are on strike because the masters refuse to sign an amended code of rules,—waited upon a meeting of employers on Tuesday night with a view to an arrangement. The masters, however, were not prepared to recede from the position taken up, and the men, being determined to maintain the attitude they had assumed, retired without any solution to the difficulty having been arrived at. It appears that in 1874 the masters signed the rules of the Joiners' and Carpenters' Society, and again in 1877 they signed some amendments. In consequence of the depression of trade, &c., the rules were revised, and the masters practically agreed to all except Rule 11, which now forms the subject of dispute. Rule 11 is to the effect that three months' notice should be given of any proposal to make an alteration in the rules, the period to expire on May 1 in any year. The masters are wishful that the period of notice should expire at any time, but the men say the masters would be able to take advantage of them in the slack seasons, and that consequently the disputes between them would be frequent; whereas on May 1 trade is usually settled, and masters know their position in regard to contracts, prices, &c. The masons are also engaged in a similar contention, and the result of their interview on the same evening with the masters, the *Post* is informed, ended in a similar manner to that of the joiners.

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Re-erection of Court Houses, Cork	The Corporation	.....	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
School Buildings, Belfast	York-st. Presb. Chrch	Young & McKenzie	June 8
Two Pairs of Semi-detached Cottages	County & City Asylum, Hereford	W. W. Robinson	June 9
*Painting Wellington Barracks	War Department	*Official*	do.
*Water Supply Works	Newton Abbott U.R.SA	S. Segar	do
*Roads, Kerb and Paving Works	Willesden Local Board	O. Claude Robson	do.
*Pipe Sewers and Surface Water Drains, &c.	do.	do.	do.
*Steel Girder Bridge	do.	do.	do.
*Supply of Road Material	Lewisham B. of W.	*Official*	do.
Lighting Town Hall with Electricity	Cleckheaton Loc. Bd.	do.	do
Digging Six Miles of Pipe Trenches	Shipley Local Board	W. B. Woodhead & Son	do.
Waterworks	do.	do.	do.
Alterations and Additions to Premises, Belfast	S. W. Boyd	J. Fraser & Son	do.
Hotel, Abergwynfi, near Bridgend	.....	G. A. Lambert	do.
Stables, Cheadle	Cheadle and Gatley Local Board	E Sykes	do.
Street Sewers, Hirwain	Aberdare Local Board	*Official*	June 10
Bridge over River Cairn	Brampton R.S.A.	Isaac Noble	do.
Sewage Disposal Works, &c.	Ampthill Bd. of Guar.	.....	do.
Chapel Restoration, Mevagissey, Cornwall	.....	T. Lelean	do.
Bridge across Tamar, Crawford	.....	J. Higgs	do.
Drainage Works	E. Calder DrainageCom	*Official*	do.
Workshops and Stables, Oldham-road	Manchester Corp.	do.	do
Schoolroom, &c. to Baptist Chapel, Machen, Newport	.....	Phillips & Holdgate	do.
Additions to Club Buildings, Cardiff	Roath Conserv. Club	Veall & Sant	do.
Road Materials	Malton U.S.A.	R. Richardson	do.
Fire Station at Cannock	Cannock Local Board	J. Peake	do.
Sewerage Works	do.	do.	do.
Broken Granite	Market Bosworth Highway Board	*Official*	do.
Painting, Distempering, &c. Workhouse	Stepney Guardians	A. & C. Harston	June 11
Storage Reservoir, &c. Treherbert	Ystrad Gas and Water Co.	T. Rees	do.
*Construction of Pipe Sewer	Clerkenwell Vestry	W. Iron	do.
Paving, with Granite, Aire-street	Castleford Local Bd.	*Official*	do.
Paving	Sunderland Corp.	do.	June 12
Six Cottages &c near Shackfield on Tyne	.....	Mr. Little	do.
New Roof, &c. Church Cottage, Ipplepen	.....	W. M. Tollit	do.
Farm Buildings, Stitston, S. Brent	Earle Brothers	.....	do.
Infant's School Premises, Aberafan	Merthyr Tidfil School Board	J. W. Iliams	do.
*Painting Works, Colchester and Wadley	War Department	*Official*	do.
Drainage Works, Erecting Bridges, &c.	Wilts and Berks Canal Co.	P. Munro & Son	June 13
Road Material	Warwickshire C. C.	F. & J. Willmot	do.
Portable Steam Cranes	Gateshead Corp.	*Official*	do.
Lighting of Lisburn by Electricity or Gas	Town Commissioners	do.	do.
Side Path, &c. Lisburn, Belfast	do.	do.	do.
Lecture Hall, &c. Ballymena	.....	Young & McKenzie	do.
*York Paving	Bermondsey Vestry	*Official*	June 15
*Making Carriageways	Islington Vestry	do.	do.
Wooden Ceilings, &c. for Church, Kilmore	.....	J. M. Roberts	do.
Three Miles of Railway	Caledonian Rail. Co.	Strain, Robertson, & Thomson	do.
Residence, Knockbreda-park, Belfast	.....	H. Seaver	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Gas Engines, Pumps, and Machinery	Hendon Local Board	S. S. Grimley	June 18
*Construction of Main Outfall Sewer, &c.	do.	do.	do.
Repairing Main Roads	Kent County Council	F. W. Ruck	June 16
Road Materials	Maidstone U.S.A.	W. G. Scoones	do.
*Tar and Asphalte Paving Works	Tottenham Local Bd.	K Worth	do
*Six-and-a-half Miles of Sewers, &c.	West Bromwich Corp	J. T. Fayrs	do.
*Construction of Stalybridge Railway June.	L. & N. W. Ry. Co.	*Official*	do.
*Blue Guernsey Granite (Broken)	Brentford Local Board	J. H. Strachan	do.
*Making-up Roads	do.	do.	do.
*Kentish Flints	Southend Local Board	P. Dodd	do.
*Flower Mills, Weymouth	.....	Partridge & Co	June 17
Repairs at Sewage Works	Hertford Corp.	*Official*	do.
*Widening Pier Head, Landing Stage, &c.	Brighton West Pier Co.	H. W. Peregrine Birch	June 18
*Works and Repairs (Bristol District)	Com. of H.M. Works	*Official*	do.
*Works and Repairs (Manchester District)	do.	do.	do.
Church, Newport-road, Cardiff	Rev. C. J. Thompson	E. M Bruce-Vaughan	do.
*Underground Urinal	Lambeth Vestry	*Official*	do.
*Chapel Lechdale	The Trustees	— Lansdown	do.
*Postmen's Sorting Office, Ealing	Com. of H. M. Works	*Official*	June 19
*Crown Post-office, Abingdon	do.	do.	do.
Reconstructing Norris Bridge, Twyford	Winchester High. Bd.	J. Robinson	do.
Constabulary Buildings and Cells, Jedburgh	County of Roxburgh	G. Potts	June 20
*Supply of Broken Granite	Harrow Local Board	E. R. Capon	do.
*New Boiler, &c. Long Reach Buildings	Met. Asylums Board	A. & C. Harston	do.
*Isolation Hospital	Swindon New Town Local Board	H. J. Hamp	do.
Calvanistic Church, Merthyr Tidfil	.....	T. Roderick	June 21
*Sewerage Works	East Dereham Valley Local Board	G. W. Brunnell	June 22
*Underground Convenience	St. Giles Bd. of Wks.	G. Wallace	do.
*Alterations, Additions, &c. Harold Court, Brentwood	Essex Lunatic Asylum Committee	H. Stock	do.
*Main Drainage Works	Finchley Local Board	Follard & Single	do.
*Sewerage Works	Richmond (Surrey) U.C.	W. Brooks	do.
*Officers House, Paling, nr. N. Yarmouth	Admiralty	*Official*	June 23
*Road Material, &c.	St Martin-in-the-Fields Vestry	C. Mason	June 24
*Erection of Stables and Cottage	Walthamstow Loc. Bd.	G. W. Hoffmeister	June 26
*Making-up and Concrete Paving Roads	do.	do.	do.
*Removal and Reconstruction of the Six Gates, Barking-hill	Essex Sewers Commrs.	J. H. Barnes	June 27
*Alterations and Additions to Workhouse, &c.	Fulham Union	H. Saxon Snell	July 2
Three Houses and Shops, Swinpow, Standingley	.....	Brsgshaw & Dixon	No date
Branch Railway	Lochgelly (Fife) Iron and Coal Co.	.....	do.
Chapel, Tantobie, Durham	.....	J. W. Thompson	do.
*Shops, Offices, and Citadel, Sheffield	Salvation Army	W. Gilbee Scott	do.
*Church, Budleigh, Salterton	.....	G. Fellowes-Prynne	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Engineer and Surveyor's Assistant	Llandudno Impt. Com.	2*l.* per week	June 12
*Surveyor	Twickenham Loc. Bd.	250*l.*	June 13
*District Surveyor (Camberwell)	LondenCountyCouncil	Fees, 880*l.*	June 15
*District Surveyor (Whitechapel)	do.	Fees, 593*l.*	do.
*Assistant Inspector of Nuisances	Battersea Vestry	101*l.* &c.	June 16
*Storekeeper	do.	105*l.*	June 18
*Inspector of Nuisances	Wandsworth B. of W.	2*l.* 10*s.* weekly	June 23

Those marked with an Asterisk (*) are advertised in this Number. Competition, p. iv. *Contracts, pp.* iv., vi., viii. *and* ix. *Public Appointments, p.* xx.

LEGAL.

A BUILDER'S CLAIM AND A COUNTER-CLAIM:

CHAPPELL *v.* NORTH.

THIS was an action by Mr. J. T. Chappell, the well-known builder, against Colonel North (the "Nitrate King") for the building of his house at Avery, Eltham, Kent. It came before the Queen's Bench Division of the High Court of Justice last week, Mr. Justice Denman and Mr. Justice Wills being on the bench.

According to the *Times* report, the claim in the writ was for a balance of 5,453*l.* on an account of nearly 80,000*l.*, after giving credit for 74,200*l.* for cash paid on account. The contract was made in April, 1889, the original contract being for the house, and a supplemental contract as to stables, &c.; the first, the main contract, containing the usual arbitration clause, the other not containing such a clause. It was alleged by the builder that the architect had valued and measured the work to the amount claimed, which Colonel North denied, alleging that the work amounted to 75,800*l.*, and no more. He also set up as a defence that it was a condition of the contract that the accounts relating to each section of the works should, on completion, be settled, and if not settled within three months that the architect should certify for the payment of such an amount as he might consider properly payable, and that the final balance should be settled by the arbitrator; and that the claim of the plaintiff for the sum of 5,000*l.* and upwards was in respect of accounts relating to the different sections of the work after the completion thereof, on account whereof sums had been paid on account by Colonel North; and, further, that none of the accounts relating to any of the sections had been settled, nor had the architect certified the payment of any amount whatever, nor had the final balance been settled or adjusted by the arbitrator; and Colonel North also set up a counter-claim for 1,200*l.* for delay and inferior work, &c. The plaintiff had taken out a summons for particulars of counter-claim, and then gave notice to discontinue the action. After that the plaintiff took out a summons under the Arbitration Act, 1889, to stay the proceedings on the counter-claim. On the part of the defendant this application to stay the proceedings on his counter-claim was opposed on the ground that the plaintiff before making it had taken a step in the action on the summons for particulars, and also an application for interrogatories. The Judge at Chambers refused to make the order to stay the proceedings on the counter-claim, and the plaintiff appealed.

The Court came to the conclusion that the order was not one which it was proper to make. The defendant had set up a counter-claim for inferior work and delay, &c. There was no reply to the counter-claim, but an application was made by the plaintiff under section 4 of the recent Arbitration Act to stay proceedings on the counter-claim. It was objected that the clause was not applicable to a counter-claim, but it appeared to the Court that it was, as there were proceedings on a counter-claim. The application, however, was opposed on the ground that the plaintiff had taken a step in the action. And he thought that taking out a summons for particulars was a "step" in the proceeding, added to which there had been an application by the plaintiff for interrogatories. This being so, the decision of the Judge was right refusing the stay, and the appeal must be dismissed.

Mr. Justice Wills concurred, observing that he regretted that the counter-claim could not be now referred to arbitration, and he feared it might lead to another application under section 14 of the Act. Even if the counter-claim might be a new and fresh proceeding, as he was inclined to think, the plaintiff had obtained an order for interrogatories after the counter-claim. The case, therefore, came within the rule that an action could not be stayed with a view to a reference to arbitration after a step had been taken in the proceeding.

Appeal dismissed.

MEETINGS.

SATURDAY, JUNE 6.

Royal Institution.—Professor A. H. Church, M.A., F.R.S., on "The Scientific Study of Decorative Colour." II. 3 p.m.

MONDAY, JUNE 8.

Royal Institute of British Architects.—Business Meeting for Members only. Election of Council, Standing Committees, and Auditors for the ensuing Session. Subsequently, there will be a Discussion as to the Curriculum of Education proposed by the Architectural Association. (Open to visitors.) 8 p.m.

WEDNESDAY, JUNE 10.

Society for the Protection of Ancient Buildings (Old Hall, Barnard's Inn).—Annual Meeting. Paper by Professor W. B. Richmond, A.R.A. 8.30 p.m.

THURSDAY, JUNE 11.

Society of Antiquaries. 8.30 p.m.

FRIDAY, JUNE 12.

Guild and School of Handicraft.—Mr. G. F. Newberry on "Impressionism and Design." 8 p.m.

SATURDAY, JUNE 13.

Royal Institution.—Professor A. H. Church, M.A., F.R.S., on "The Scientific Study of Decorative Colour." III. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

9,172.—ROOF AND HANGING TILES: *R. J. Withers.*—To obviate the slipping off of the tiles, provision is made by this invention for locking, binding, or securing the tiles together, and if the nail, cement, or other fastening of one or more of the tiles gives way, it will be retained in position and will not fall or slip. No necessity exists with this method for lines or setting out, specially-prepared gauges being used. Increase in strength and support is provided, the tiles are easy to fix and remove, and are suitable for use with either battens or boards.

9,289.—MOUTHPIECE FOR BRICK-MAKING MACHINES: *W. Wood.*—An improved form of mouthpiece is the subject of the invention, the back and lessening in degree as it approaches the face of the nozzle; the issuing orifice being of the exact shape of the brick being made.

16,132.—CHIMNEY OR VENTILATING COWL: *C. Mitchell.*—The lower part of this cowl, which fits over the top of the shaft or chimney, is formed in the shape of a louvre, at an angle of 45 deg., upon which a vertical cylindrical cap is supported, a slight clearance being allowed between the top of the louvre and the under edge of the cap. A horizontal disc, convex or domed on its under and upper surfaces, is hung so as to deflect the wind coming from above on to the louvre beneath, against which it strikes, rebounding upward, and drawing with it the smoke and air from the chimney shaft.

2,288.—VENTILATING COWLS: *J. Bartlett.*—The discharge opening of the ventilating flue is enclosed by a chamber having one or more sides sloping outward, with escape openings governed by tale flaps loosely hung.

4,962.—BUILDINGS, &c.: *A. Goerke.*—This invention relates to a method of constructing structures of iron in combination with cement in such a manner that the iron gives strength to the structure through its tensile properties, while the cement gives strength to the structure in resisting pressure.

5,166.—HANGING SASHES: *S. Pitt.*—Instead of using two cords and weights, one cord with a heavy and light weight adjusted to the weight of the sashes is used for safety and convenience in raising or lowering the sashes.

5,209.—ARTIFICIAL MARBLE: *H. Bruck.*—This patent relates to the manufacture of an imitation marble mass called "Marmorit," consisting of a mixture of carbonate of lime, magnesia, quicklime, silicic acid, argillaceous earth, and chloride of magnesium mixed with water and colouring matter, then cast or poured into moulds.

NEW APPLICATIONS FOR PATENTS.

May 19.—8,500, F. & C. Roper, Dies for Making Solid or Perforated Bricks, either Square or Ornamental. —8,503, A. Lamplough, Sash Fasteners. —8,513, C. Turnofsky, Grate Bars.—8,533, A. Morrison & M. Ingram, Water-closets.—8,548, C. Apple, Sash Fasteners.—8,550, G. Winkle, Locks and Latches.—8,569, E. Singleton, Disinfecting Water-closets, &c.—8,567, O. Imray, Artificial Stone.—8,570, L. D'Auria, "Dogs" for Carpenters' Benches, &c.

May 20.—8,589, J. Richardson, Hinges.—8,597, N. Haigh, Wood-sawing Machines.—8,610, A. Gutensohn, Producing Lead Dust and Converting same into White Lead.—8,639, A. Lespagnol, Safety Bolts for Doors, &c. —8,649, J. Tylor, Regulating and Limiting the Supply of Water from Mains to Service Pipes.

May 21.—8,674, W. Tayler, Construction of Buildings and Walls.—8,690, E. Woakes, Jointing Thin Metal Pipes.—8,700, G. Jennings, Bonding Bricks.

May 22.—8,713, T. Simmons, Washable and Varnishable Substitute for Oil Paints and Distempers.—8,717, A. Laverack, Heating Buildings, &c.—8,730, C. Everson, Metal Roof.—8,747, W. Willmott, Spring Latch and Lock Sash Fastener.—8,749, H. Burnet & W. Groom, Testing Drains or Soil Pipes.—8,753, E. Boys, Sash Fasteners.—8,755, G. Connock, Fastening for Windows and Doors.

May 23.—8,775, N. Lines, Water-closet Cisterns.—8,783, C. Campbell, Ventilating Cowls.

PROVISIONAL SPECIFICATIONS ACCEPTED.

4,759, H. Batson, Folding safety Steps or Ladders.—3,018, C. Henshaw, Ventilating-rooms.—6,274, J. Lee, Door or Window-fastener.—6,395, F. Jones, Joint for Soil and like Pipes.—6,467, W. Munns, Screw-driver.—6,559, J. Nicol, Electric Bell-push.—6,647, J. Stott, Window-sash Fasteners.—7,370, T. Hunt, Glazing of Earthenware Pipes, &c.—7,659, G. Emerton, Glazing Roofs, &c.—7,848, J. Jeyes, Compound, applicable as size.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

11,144, J. Merrill, Latrines or Water-closets.—11,522, J. Bayly, Dry Walls.—11,541, C. Muller, Stoves.—6,797, G. Welgelin, Drying Moist Material, for instance, newly-formed bricks, &c., by means of artificial heat.—6,822, S. Gardner, Sash Balances.—6,907, A. Mackett, Mitre Cutting-machines.—7,016, G. Downing, Ventilator.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MAY 25 By *Ellis & Son:* 79 to 87 (odd), Mare-st., and 1 to 10, Essex-st., Hackney, c., 3,520*l.*; 89 to 109 (odd), Mare-st., and 22, Essex-st., c., 5,625*l.*—By *A. Chancellor:* 43, Burnaby-st., Chelsea, u.t. 92 yrs., g.r. 16*s.*, r. 40*l.*, 700*l.*; f.g.r. of 9*l.* a year, Railton-rd., Brixton, 225*l.*; a block of land with buildings thereon, Shepperton, c., 460*l.*—By *J. g. Baker & Son:* 36, Brondesbury-villas, Kilburn, u.t. 66 yrs., g.r. 11*l.*, 600*l.*—By *Fuller, Moon, & Fuller:* The residence "The Heritage," Reigate, r. 30*l.*, f., 450*l.*—By *Holcombe & Betts:* Chapel Cottage," Victoria-pl., Kilburn, f., r. 28*l.*, 70*l.*; 1, 2, and 3, Railway-parade, Walthamstow, f., 1834. 10*s.*, 1,520*l.*—By *Foster, Howell, & Co.:* 45 and Chelsham-rd., Clapham, u.t. 71 yrs., g.r. 19*l.*, 1,245*l.* By *H. Hooper:* "Hinchera Villa," Marlborough-rd., Tooting, f., r. 50*l.*, 530*l.*; 27, Grange-pk., Thornton Heath, f., r. 20*l.*, 220*l.*

MAY 26.—By *Debenham, Tewson, & Co.:* F.g.r. of 80*l.*, with reversion in 18 yrs., King's-rd., Chelsea, 5,550*l.*; f.g.r. of 80*l.*, with reversion in 65 yrs., 1,920*l.*; 1, The Village, Child's Hill, f., 680*l.*—By *Field & Son:* 36, Derwent-grove, Dulwich, u.t. 85 yrs., g.r. 8*l.*, 225*l.*; 1, Wheatsheaf-yd., City of London, u.t. 39 yrs., g.r. 30*l.*, r. 160*l.*, 1001.; 19, Sumner-st., Southwark, f., 700*l.*; 39, Lant-st., r. 36*l.*, 375*l.*; 80, 81, and 82, George-row, Bermondsey, 440*l.*—By *Osborne & Mercer:* Two enclosures of land containing 12*a.* 0*r.* 12*p.*, f., Lindfield, Sussex, 950*l.*—By *Tidey & Son:* 81, Rotherfield-st., Islington, u.t. 42 yrs., g.r. 7*l.*, r. 34*l.*, 285*l.*; 51, Navarino-rd., Dalston, u.t. 54 yrs., g.r. 9*l.*, r. 32*l.*, 380*l.*; 10, Caledonia-st., King's-cross, u.t. 27 yrs., g.r. 17*l.*, r. 36*l.*, 150*l.*; 5 and 6, Pedro-st., Clapton, u.t. 87 yrs., g.r. 10*l.*, r. 41*l.* 12*s.*, 145*l.*; and 3, Scrutton-st., Finsbury, f., r. 60*l.*, 1,190*l.*—By *Wilson, Barnett, & Eldridge:* 10, Pk.-hill, Richmond, u.t. 68 yrs., g.r. 8*l.*, r. 65*l.*, 650*l.*; 17 and 19, Hillgrove-rd., St. John's-wood, u.t. 53 yrs., g.r. 20*l.*, r. 115*l.*, 700*l.*; 6 and 8, Grange-st., Hoxton, u.t. 45 yrs., g.r. 7*l.*, r. 60*l.*, 620*l.*—By *A. Booth:* 29, The Common, Poolwich, u.t. 39 yrs., g.r. 7*l.* 19*s.* 6*d.*, r. 80*l.*, 710*l.*; with reversion in 18 yrs., Camden-rd., with stabling, u.t. 47 yrs., g.r. 6*l.*, 50*l.*; 15, St. Bartholomew-rd., Holloway, u.t. 29 yrs., g.r. 7*l.* 10*s.*, 800*l.*—By *Vinten & Son:* 17, Royal-cres., Ramsgate, f., 1,000*l.*; two enclosures of land, containing 5*a.* 0*r.* 17*p.*, f., near Margate, 350*l.*—By *Horncastle & Pember:* 9 and 11, Chatto-rd., Battersea, u.t. 93 yrs., g.r. 6*l.*, r. 60*l.* 18*s.*, 250*l.*—By *G. Head & Co.:* 183, 189, and 191, Ladbroke-grove-rd., Notting-hill, u.t. 76 yrs., r. 30*l.* 10*s.*, 480*l.*

MAY 28.—By *Debenham, Tewson, & Co.:* f.g.r. of 150*l.*, with reversion in 78 yrs., the Broadway, Westminster, 2,000*l.*; 5, Pk.-pl.-villas, Maida-hill, u.t. 45 yrs., g.r. 15*l.*, 500*l.*—By *C. C. & T. Moore:* 28 to 31, 37, 38, and 39, Carpenter-rd., Stratford, Essex, 28 to 31, u.t. 96 yrs., g.r. —; Nos. 37 to 39, u.t. 71 yrs., g.r. 12*l.*; total r. 91. 11*s.*, 680*l.*; 13, Lyal-rd., Mile End, u.t. 59 yrs., g.r. 13*l.* 13*s.*, 270*l.*; 28 to 36 (even) Nicholas-st., u.t. 39 yrs., g.r. 15*l.*, 1,160*l.*; 99, Dempsey-st., Stepney, u.t. 22 yrs., g.r. 3*l.*, r. 3*l.*, 250*l.*—By *E. Stimson:* 116, Hindman's-rd., Peckham, f., 190*l.*; 74 and 76, Henslowe-rd., f., 85 yrs., g.r. 11*l.*, r. 52*l.*, 2,0*l.*; 206, Elms-rd., Clapham, f., r. 50*l.*, 600*l.*; 5, D'Eynsford-rd., Camberwell, f., r. 33*l.* 16*s.*, 320*l.*; f.g.r. of 35*l.*, with reversion in 17 yrs., Southampton-st., 820*l.*; f.g.r. of 25*l.*, with reversion in 99 yrs., Edmund-st., 570*l.*; 66, Alma-st., Hoxton, 644 yrs., g.r. 6*l.*, r. 32*l.*, 335*l.*; 9 and 10, Burton-rd., Brixton Heath, u.t. 74 yrs., g.r. 11*l.* 10*s.*, 230*l.*; to 33 (odd) Ashberry ter., r. 52*l.*, 2,0*l.*; 206, Elms-rd., 16*s.*, 490*l.*—By *Newbon & Co*, 156 and 158, Romanrd, Old Ford, f., r. 49*l.* 8*s.*, 590*l.*; 70, Milton-rd., f., r. 12*s.*, 270*l.*; 200, Green-st., Bethnal Green, u.t. 920 yrs., g.r. 11*l.*, r. 32*l.* 10*s.*, 300*l.*; 141, East-road, Hoxton, 56 yrs., g.r. 12*l.*, r. 70*l.*, 690*l.*; 82, 84, and 86, Bow Common-lane, Bow, f., r. 92*l.*, 980*l.*; 21, Essex-rd., Islington, c., r., 40*l.*, 530*l.*; 1 to 7, Broad-yd., c., r. 50*l.*, 825*l.*—By *Dyer, Son, & Hilton*, 31 33, and 35, High-rd., Lee, u.t. yrs., g.r. 21*l.*, r. 195*l.*, 2,065*l.*; 39 and 43, High-rd., u.t. yrs., g.r. 14*l.*, r. 130*l.*, 1,325*l.*—By *W. & F. Houghton*, "The Priory," Forest-rd., Walthamstow, and 19a. 0*r.* 19*p.*, f., 560*l.*; "Clarence Villa," Abbey Wood Rise, Erith, u.t. 61 yrs., g.r. 4*l.*, 30*l.*, 300*l.*; 28, Coborn-st., Bow, u.t. 25 yrs., g.r. 6*l.*, r. 32*l.*, 175*l.*; 33, Newr-rd., Whitechapel, u.t., yrs, g.r. 4*l.* 9*s.* 2*d.*, r. 50*l.*, 170*l.*; f.g.r. of 22*l.* 10*s.*, with reversion in 75 yrs., Berridge-rd., Gipsy Hill, 415*l.*; f.g.r. of 77*l.* 5*s.*, with reversion in 96 yrs., West-st., Erith, 1,330*l.*—By *Slade & Butler:* F.g.r. of 52*l.* 10*s.*, with reversion in 79 yrs., Hamboro-rd., Streatham, 1,050*l.*—By *W. H. Hawes:* 3 and 4, The Angle, Streatham, f., r. 70*l.*, 880*l.*—By *Ramsey & Co.:* 20*a.*, York-grove, Peckham, u.t. 87 yrs., g.r. 7*l.*, 325*l.*

MAY 29.—By *H. Griffin:* 179, Bridge-rd., Battersea, u.t. 72 yrs., g.r. 7*l.* 10*s.*, 400*l.*; 1, 2, and 3, Livingstone-rd., Clapham Junction, f., r. 46*l.* 16*s.*, 420*l.*—By *J. T. Ayton:* 1, St. Helen's-ter., Mile End, u.t. 56 yrs., g.r. 9*l.*, 550*l.*—By *Dunn & Soman:* "The Red Cross" public-house, Upper East Smithfield, f., r. 80*l.*, 1,600*l.*—By *Bray, Young, & Co.:* Two plots of f. building land, Leyton, 80*l.*—By *Reynolds & Eason:* 46 and 48, St. Thomas's-rd., Victoria Pk., u.t. 62 yrs., g.r. 7*l.*, 1,055*l.*; 31 to 37 (odd), East-rd., City-rd., u.t. 23 yrs., g.r. 72*l.*, r. 343*l.* 2*s.*, 1,010*l.*—By *Goddard, Croxford, & Furness:* 19, 21, and 23, Surrey-rd., Gunnersbury, u.t. 82 yrs., g.r. 12*l.*, 310*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/0/0	9/0/0
Teak, E.I. load	8/10/0	14/0/0
Sequoia, U.S. ft. cu.	2/3	3/0
Ash, Canada load	2/10/0	4/5/0
Birch, do. ,,	2/3	4/5/0
Elm, do. ,,	3/10/0	4/15/0
Fir, Dantzic, &c. ,,	2/0/0	3/15/0
Oak, do. ,,	2/10/0	4/10/0
Canada ,,	4/17/6	6/10/0
Pine, Canada red ,,	2/10/0	3/10/0
Do., yellow ,,	2/0/0	5/15/0
Lath, Dantzic fath	6/0/0	8/0/0
St. Petersburg ,,	5/0/0	7/0/0
Deals, Finland, 2nd & 1st std 100	7/15/0	10/10/0
Do. 4th & 3rd ,,	7/5/0	8/5/0
Do. Riga ,,	6/5/0	7/15/0
St. Petersburg, 1st yellow ,,	9/15/0	14/0/0
Do., 2nd yellow ,,	8/0/0	9/0/0
Do. white ,,	6/10/0	10/10/0
Swedish ,,	6/15/0	18/15/0
White Sea ,,	8/5/0	17/0/0
Canada, Pine 1st	14/0/0	24/0/0
Do. do. 2nd ,,	9/0/0	15/10/0
Do. do. 3rd & 2nd ,,	6/10/0	10/0/0
Do. Spruce 1st	8/15/0	11/0/0
Do. do. 3rd & 2nd ,,	6/5/0	7/15/0
New Brunswick ,,	5/5/0	7/0/0
Battens, all kinds ,,	8/10/0	15/10/0
Flooring Boards, sq., 1 in. prep.	1/10/0	0/14/0
1st ,,	0/9/0	0/10/6
2nd ,,	0/8/0	0/7/6
3rd ,,		
Other qualities	0/8/0	0/7/6
Cedar, Cuba ,ft.	/4	/4
Honduras, &c. ,,	/4	/4
Mahogany, Cuba. St. Domingo, cargo av	/4½	/6½
Mexican do. do	/4½	/5½
Tobasco do. do	/6½	/7
Honduras do.	/5½	/6½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio ,,	10/0/0	20/0/0
Bahia ,,	9/0/0	18/0/0

TIMBER (*continued*).		
Satin, St. Domingo ,,ft.	0/0/10	0/1/8
Porto Rico ,,	0/0/10	0/1/6
Walnut, Italian ,,	0/0/3½	0/0/7
METALS.		
IRON—Bar, Welsh, in London ton	6/5/0	6/15/0
Do. do. at works in Wales ,,	5/15/0	6/5/0
Do. Staffordshire, in London ,,	6/5/0	7/0/0
COPPER—British, cake and ingot	56/0/0	57/0/0
Best selected ,,	59/0/0	60/0/0
Sheets, strong ,,	68/0/0	0/0/0
Chili, bars ,,	52/10/0	0/0/0
YELLOW METAL lb.	0/0/6	0/0/6½
LEAD — Pig, Spanish ton	12/10/0	12/12/6
English, com. brands ,,	12/12/6	12/15/0
Sheet, English, 4 lbs. per sq. ft. and upwards ,,	14/5/0	0/0/0
Pipe ,,	14/15/0	0/0/0
ZINC — English sheet ton	26/5/0	0/0/0
Vieille Mon- tagne ,,	26/15/0	0/0/0
TIN—Straits ,,	80/10/0	0/0/0
Australian ,,	80/15/0	0/0/0
English Ingots	94/10/0	0/0/0
OILS.		
Linseed ton	22 15 0	22 0 0
Cocoanut, Cochin ,,	38 0 0	0/0/0
Do. Ceylon ,,	2 10 0	0 0 0
Palm, Lagos ,,	29/0/0	29/5/0
Rapeseed, English pale ,,	30/10/0	31/0/0
Do. brown ,,	29/0/0	29/5/0
Cottonseed ref. ,,	21/5/0	0/0/0
Olein ,,	21/15/0	24 0 0
Lubricating, U.S. ,,	6/0/0	7/0/0
Do. refined ,,	7/10/0	12/0/0
Tar—Stockholm barrel	1/0/0	0/0/0
Archangel ,,	0/13/6	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

BATLEY.—Accepted for building boiler house and tall chimney (brick) in Bradford-road, Batley. Mr. T. A. Buttery, architect, Queen-street, Morley. Quantities by the architect. Masons' and bricklayers' work contracted for only.

George Whitehead, Aubrey-street, Dewsbury ... £320 0 0

BROMLEY (Kent).—For erecting a south transept and narthex to the Church of St. Mary, Palstow, for the Vicar and Wardens. Messrs. Wadmore, Wadmore, & Mallett, architects, 35, Great St. Helen's, E.C.

Holt & Son	£1,890	0 0
Wiltshire	1,775	0 0
Crossley	1,715	0 0
Boome	1,564	0 0
Arnaud & Son	£1,561	0 0
Doug as Payne	1,550	0 0
G. J. Jones	1,503	12 11

BUCKHURST HILL (Essex).—For the erection of new laundry at Red House, for the Rescue Society. Mr. E. Tidman, C.E., architect:—

F. J. Coxhead, Leytonstone (accepted) £355 0 0

CLIFTON.—For erecting Parish-hall, Clifton. Messrs. Habershon & Fawckner, architects.

W Cowlin	£1,880	W. Gilbraith	£1,742
W Cowin & Son	1,849	A. J. Bowden	1,740
E. Walters	1,838	Stephens Bishop, & Co.	1,734
J. Wilkins	1,795	Hale & Westlake	1,719
J. Perrott	1,750	J. E. Davies	1,624

[All of Bristol.]

DINAS POWIS.—For the erection of a residence at St. Andrew's, Dinas Powis, for Mr. T. Morel. Messrs. Jacobs & Pickwell, architects, Cardiff. Quantities supplied.

J. nes Bros	£3,975	Venning Bros., Cardiff*	£2,888
Shepherd & Sons	3,640	Jenkins & Arnold	2,881
Lubbock	3,315	* Accepted.	

DOVER.—For the erection of a school-room in connexion with Russell-street Congregational Chapel, Dover. Messrs. Creaswell & Newman, architects & engineers, 34, Castle-street, Dover:—

W. Brenley	£1,[illegible]	W. Dowsett	£1,198
G. H. Denne & Son	1,[illegible]	Austin & Lewis	1,183
H. Stutt	1,[illegible]	J. A. Lewis	1,180
W. J. Adcock	1,[illegible]	H. Richardson	1,[illegible]
G. Lewis & Son	1,[illegible]	James J. Wise*	1,128
J. Parsons	1,[illegible]	* Accepted.	

DURHAM.—For the erection of six houses at Witton Gilbert, for Mr. Wm. Logan. Mr. J. Wm. Routhwaite, architect, 13, St. Cuthbert's-terrace, Blackhill, Co. Durham:—

G. Gradon & Sons	£1,217	0	M. R. Draper	£1,061	0
J. Shepherd	1,110	0	E. Rutter, Esh, Durham*	996	4
	* Accepted.				

EASTWOOD (Notts).—For the erection of store at Eastwood, for the Langley Mill, &c., Co-operative Society. Mr. G. e. Haslam, architect, Euclid House, Ilkeston. Quantities supplied.

W Durant	£2,564	15	1	J. A. Pollitt	£2,289	0	0
Wardley & Marlie	2,[illegible]	0	0	R. Keith	2,[illegible]	0	0
E. Adcock & Son	2,[illegible]	0	0	Bros. Brown	2,[illegible]	0	0
Jn. Hutchinson	2,[illegible]	0	0	W. E. Shaw Beacon	2,068	0	0

* Accepted.

FOREST GATE.—For new Lamp-shop, "Princess Alice" Hotel, Forest-gate, E., for Mr. C. J. Knowler. Mr. James F. Wesley, architect:—

Sharpe (too late)	£563	0	Trent	£340	0
Atherton & Latta	547		Wordley	336	12
Bishop & Webb	540	0			

HORTON (near Leek).—For farm homestead (Taylor's Barn) at Broadmeadows, for Mr. J. C. Antrobus. Messrs. William Sugden & Son, architects, Leek. Quantities by the architects.

William Lovatt, Baddiley (accepted) £982 0 3

LONDON.—For further repairs and alterations to houses in Wicklow-place and Tabard-street, Borough, for the Trustees of the Randall Estate. Messrs. Waring & Nicholson, architects, 95, Parliament-street, S.W.

W. C. Lee, Great Bookham £1,401 2 0

[No competition.]

LONDON.—For new water-closets, staircases, and sundry other works at No. 2c, Kirby-street, Hatton-garden, for Mr J. Jaques.

Brown & Harris	£[illegible]	Salt	£385
Wells & Son	320	Hayworth	243
Leighton	315	McCormick & Sons (accepted)	229

LONDON.—For works at "The King's Arms," Glasshouse-street, W., for Messrs. Parker Bros. Mr. H. J. Newton, architect, 49, Lincoln's-inn-fields, W.C.

Lea & Son	£[illegible]	Gild & Brand	£1,335
Jones Bros	1,[illegible]	Dove Bros. & Son	1,322
Feltham & Betheringham	1,[illegible]	Holloway Bros.	1,311

* Accepted.

LONDON.—For alterations and additions to the premises, Warwick-row and Brewer-street, for Mr. E. Grange. Mr. Henry Branch, architect and surveyor, 25, Cheapside, E.C.:—

Turtle & Appleton	£3,235	B. C. Nightingale	£2,935
Holloway Bros.	3,195	Wilkes Bros.*	2,899
Prestige & Co.	2,969	* Accepted	

LONDON.—For the erection of warehouse, Southwark Park-road, Bermondsey, for Mr. E. Funk. Messrs. G. Elkington & Son, architects, 85, Cannon-street, E.C.:—

W. & H. Cable	£574	J. Chalkley	£493
B. Wells	527	W. F. Russell (accepted)	499

LONDON.—For new private bar, &c., to the "Prince Alfred," Alscot-road, Bermondsey, for Mr. Badcock. Messrs. G. Elkington & Son, architects, 95, Cannon-street, E.C.:—

A. White & Co.	£119	J. Chalkley	£92
J. Roffey	96	W. F. Russell (accepted)	89

LONDON.—For new bath room, and general repairs at 83, Aldersgate-st. and 1, Weaver-st., for Messrs. T. Rowe & Co. Mr. Arthur O. Breeds, architect, 22, Blomfield-road, St. John's-wood.

Gregory & Hence	£306	Langridge & Co.	£175
Munday & Son	18[illegible]	J. Myring & Co. (accepted)	170

LONDON.—For pulling down and rebuilding No. 11, Hatton-garden, E.C. for Mr. Frederick Shaw. Mr. Walter Graves, 'tenant at Winchester House, E.C. Quantities by Messrs. Campbell & Smith.

Brass & Son	£4,718	Lawrence & Son	£4,370
Harris & Wardrop	4,619	Bruyer & Sons	4,387
Myers & Sons	4,419	B. E. Nightingale	3,875
J. & S. Bowyer	4,[illegible]		

LONDON.—For the erection of four houses and one shop, Cottonstreet, Poplar E. for Messrs. Smith, Garrett, & Co., Limited. Messrs. Newman & Newman, architects:—

W. Jennings	£1,801	J. & H. Cocks	£1,636
Everard	1,787	Salt, Limehouse (accepted)	1,614

LONDON.—For alterations, &c., to granary, Royal Mail-yard, Cathcart-street, Kentish Town. Mr. P. Dollar, architect:—

Toms	£595	McCormack	£543
Shepherd	575		

LONDON.—For the erection of dental schools, &c., for the Treasurer and Governors of Guy's Hospital, Southwark, S.E. Messrs. Woodd & Ainslie, architects:—

Foster & Dickson	£11,838	B. E. Nightingale	£9,920
Dove Bros.	10,575	Holloway Bros.	9,900
Shillitoe Bros.	10,150	Goddard	9,845
Charteris	10,100	Cornish & Gaymer	9,436
Fellmore	10,000		

LONDON.—For rebuilding warehouse, Jamaica-street, Haymarket, for Mr. W. F. Williams. Mr. E. Cullutt Nicholls, architect:—

Scrivener	£3,670	Kilby & Gayford	£3,287
Laurance & Son	3,593	Watson	3,230
B. E. Nightingale	3,[illegible]	Mortar	3,132
Grover	3,[illegible]	Tuson	3,049
Taylor	3,329		

LONDON.—For alterations to the "Reindeer," Rye-lane, S.E., for Mr. C. Newman. Messrs. Eedle & Meyers, architects, Peckham, S.E.

J. & H. Cox	£1,947	Rider & Son	£1,878
Chappell	1,920	W. Smith	1,872
Avis	1,915	Spencer & Co.	1,850
McLachlan	1,898	B. E. Nightingale	1,820

LONDON.—For alterations to the "Golden Lion," Denmark-hill, S.E., for Mr. Charles Young, architect:—

Kilby & Gayford	£3,638	Whitehead	£3,100
Godfrey	3,290	Lascelles	3,035
Higgs	3,284	Turtle & Appleton	2,982
B. E. Nightingale	3,147		

LONDON.—For the fitting up of shop and forming of shop-front, &c., to No. 255, Walworth-road, S.E., for Mr. J. J. Lidle. Mr. Albert L. Guy, architect, 78, High-street, Lewisham:—

Drew & Cadman	£458	15	0
Rosenberg, Westminster Bridge-road (accepted)	425	0	0

LONDON.—For the erection of a stable, for Mr. John Wallis, at "Riverdale," High-street, Lewisham. Mr. Albert L. Guy, architect, 78, High-street, Lewisham.

R. Soper	£498	10	D. & R. Kennard, Lewis-
S. J. Jerrard	420	0	ham (accepted)	£455	0
C. Robson	395	0			

LONDON.—For the formation of new road and sewers on the "Woodlands" Estate, Peckham-rye. Mr. Albert L. Guy, architect and surveyor, 78, High-street, Lewisham:—

Mayo, Brixton (accepted)	£840	0	0

LONDON.—For the erection of parish hall, ante-chapel, &c., for the Vicar and Churchwardens of the Parish of St. Mary, Lewisham. Mr. Albert L. Guy, architect, 78, High-street, Lewisham:—

Mattock Bros	£4,[illegible]	S. J. Jerrard	£3,689
Chas. Robson	3,941	J. O. Richardson, Peckham (accepted)	3,699
D. & R. Kennard	3,79[illegible]		

LONDON.—For alterations and repairs at Perry-hill lecture-hall, Forest-hill, S.E., for use as a public library, for the Library Commissioners. Mr. Albert L. Guy, architect, 78, High-street, Lewisham:—

Waddington	£342	0	0	Chas. Robson, Lewis-
Sykes	304	0	0	ham*	£260	0	0
Christmas	283	18	4	* Accepted.			

LONDON.—For the erection of new hall, &c., for the Working Lads' Institute, Fonthill-road, Finsbury Park. Mr. G. B. Greatbach, architect, 31, Moorgate-street, E.C.:

C. W. Ward & Co.	£1,418	B. Wells	£1,150
Sabey & Son	1,350	E. A. Rosone	1,120
Marlock Bros.	1,331	Allard	1,100
J. Grover & Son	1,294	W. Wells	1,100
A. & W. Garmar	1,168		

LONDON.—For sewer works in Mitcham-lane, Streatham, for the London County Council. Mr. A. R. Binnie, Engineer:—

Thos. Adams, 22, Canal-road, King-land, N. (accepted)	£5,459	2	3

PENARTH.—For the erection of a residence, with stables, coach-house, &c., Messrs. Jacobs & Pickwell, architects, Bank buildings, St. Mary-street, Cardiff. Quantities by Messrs. Jacobs & Pickwell:—

F. Isatell	£7,649	C. Shepherd & Son	£6,885
Jones Bros.	7,500	C. Bartell	6,865
J. Hopkins	7,100	D. G. Price, Penarth*	6,666

* Accepted

PINNER.—For painting, &c., at Commercial Travellers' School, Pinner, Middlesex:

Pitman & Son	£1,201 10	John Greenwood	£1,000
Campbell, Smith, & Co.	1,060 0		

ROCHESTER.—For curbing, paving, channelling, &c., Almondsbury, Rochester, for the Corporation:—

Rackham & Bentham, Plumstead, S.E. (accepted at schedule of prices)			

SALISBURY.—For erecting new baths and laundry, Salisbury. Mr. Alfred C. Bothamley, architect, Salisbury:—

E. Day	£4,290	C. A. Hager	£2,641
Stephens, Badcock, & Co.	4,249	H. Cooper	2,634
C. Witley	2,912	F. Rocks	2,602
Young Bros.	2,758	King (Derby)	2,499
G. Witt	2,685	J. Witt	2,374
Webb & Co.	2,740		

SOUTHAMPTON.—For alterations and additions to "The Eagle Hotel," South Front, Southampton. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton:—

Brinton & Bone, Southampton (accepted)	£597	10	0

SOUTHAMPTON.—For enlargements and reconstruction of Freemantle Congregational Church, Southampton. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton:—

W. Franklin	£2,340	T. H. Kingcombe	£2,085
H. Stevens & Co.	2,285	Brinton & Bone	1,998
W. R. & C. Lights	2,149	A. Warden, Southampton*	1,928

* Accepted.

SOUTHAMPTON.—For the erection of hothouse, drying-houses, and other works, Old Brick-road, Weston, near Southampton, for Messrs. Lankester & Crook. Messrs. W. H. Mitchell, Son, & Gutteridge, architects, Southampton:—

W. Franklin	£1,621	H. Stevens & Co., Southampton	£127
W. H. Chapman	145	(to be accepted)	

STRATFORD.—For the erection of a warehouse at Stratford, E., for Messrs. A. Beake Roberts & Co. Messrs. Fletcher & Migotti, architects. Quantities supplied:—

Norton & Son	£810	Chessum & Sons	£786
McCormick & Son	795	Gregg & Son, Stratford*	771

* Accepted.

TOTTENHAM.—For making additions to present schools and new infant schools, Vartry-road, Stamford Hill. Mr. C. Bell, architect:—

F. J. Coxhead, Leytonstone (accepted)	£6,289	0	0

TOTTENHAM.—For the erection of citadel buildings, for the Salvation Army, at Page-green. Mr. W. Gilbee Scott, architect:—

F. J. Coxhead, Leytonstone (accepted)	£1,337	0	0

WALTON-ON-THAMES.—For building billiard-room at the "Grapes," for Mr. Thomas Hewitt. Mr. A. Pennington, architect:—

H. Ingram & Co.	£432	10	
H. Dee	425	0	
F. Peters	£395	0	

WENDOVER (Bucks).—For sanitary alterations at the Manor House, Wendover, for Lieut.-Colonel Godwin. Mr. W. D. Scott-Moncrieff, M. Inst. M. E., Engineer, 86, Newman-street, W.:—

The North British Plumbing and Decorative Sanitation Company (accepted)	£273	0	0

[No competition.]

WYCOMBE.—For new covered tennis-court at Wycombe Abbey, for the Right Hon. Lord Carrington. Mr. Arthur Vernon, architect, 26, Great George-street, Westminster:—

Hunt	£1,423	Gibson	£1,389
Flint	1,389	Loseley, Wycombe*	1,237

* Accepted.

* *Painting, &c., St. Pancras Infirmary.*—We are informed that the tender of Messrs. Rowe Bros., of 55, Wellington-street, Camden Town, has been accepted at £2,741 10s. on an amended specification.

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The Builder.

VOL. LX. No. 2263. SATURDAY, JUNE 13, 1891.

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The Bedford Estate, London.

"Why, Bloomsbury is the very height of the mode," says Mr. St. John. "'Tis *rus in urbe*. You have gardens all the way to Hampstead, and palaces round about you,—Southampton House and Montague House." "Where you wretches go and fight duels," cries Mrs. Steele.—"Esmond," book 2, chap. xv.



It is a significant circumstance in the rental history of London that a considerable extent of the better residential area appertains to the Crown, the Ecclesiastical Commissioners, and our wealthy ducal houses of Grosvenor, Bentinck, and Russell. The Duke of Bedford's town property, situated in the parishes of St. Paul, Covent Garden, St. George, Bloomsbury, and St. Pancras, was acquired by his predecessors in this wise:—At the Dissolution the convent garden of St. Peter's Collegiate Church at Westminster was assigned to the Duke of Somerset. After his attainder a patent was issued to John, first Earl of Bedford, in May, 1552, of its fifty acres, lying in St. Martin's-in-the-Fields, together with seven acres, *olim* the Elms or Elm Close (Long-acre), of the yearly value of 6*l.* 6*s.* 8*d.*, to be held in socage and not in capite. Earl John had already acquired grants of the possessions of Tavistock Abbey, 1540, and of Woburn Monastery, 1550. On his new property either he or his only son, Francis, second Earl, built a town house, constructed it is said mostly of wood. An old plan, undated, yet *circa* 1680, in the Crowle Pennant, British Museum, shows clearly the position and surroundings of the house. With a narrow frontage and court-yard to the Strand, and extending back to Maiden-lane, it stood next east of Half Moon-passage, since Bedford-street, and over the site of Southampton, formerly Bedford, street. The two gardens, to the north and north-east, between Maiden-lane and the stables at top of Burleigh-street, had a terrace walk along their northern wall. In this wall, the southern boundary of Covent Garden, were two demi-lune bastions; another similarly-shaped bastion, projecting from the western wall, lay behind the north side of Maiden-lane. The stables had a door in the southern end of Charles-street.*

For many years the area had no settled population. Even in 1627 only two persons are rated for St. Martin's-in-the-Fields as being of Covent Garden. Francis, fourth Earl (died 1641), laid out the big square, for which Inigo Jones designed a Piazza that was never completed and has lately been reduced to its northern side or Great Piazza. The Piazza, first named, says Peter Cunningham, in the rate-books for 1634, soon became, with Bow-street, built in 1637, a quarter of the town highly in vogue with the quality, and so they both continued to be until about 1725.† Russell-street dates from 1634. Charles-street, since absorbed in Wellington-street, together with King and Henrietta streets, were built in 1637, and named after the Sovereign and his consort. James, Duke of York, gave a name to York-street, laid out in the preceding year; the date "1636" appears on a tablet against the front of Messrs. Bell & Sons' premises, formerly the shop and home of the late Henry G. Bohn. The north side of Tavistock-street, which had been built by 1627, was pulled down for an extension of the market in 1887, and much of the northern side of Henrietta-street has been lately rebuilt. Garrick-street, originally planned by Pennethorne in 1826, was made in 1865. Mr. Frederic Marrable was architect of the new premises for the Garrick Club, established, 1831, in King-street. Bedfordbury, in St. Martin's-in-the-Fields, was laid out in 1637. Many of its purlieus were cleared away for industrial dwellings ten years ago: some old houses along the west side remain.

An Order in Council of January 7, 1645, erected Covent Garden into a separate parish which was entirely surrounded by the mother parish of St. Martin. A confirmatory Act of 1660 for making the precincts parochial, sets out the boundaries thus:—

"That all that Precinct included within the Bounds and Limits hereafter expressed: that is to say, beginning at the Strand at the east-end of the Messuage called Bedford House, and including the said House, with all the Outhouses, Gardens, Yards, Buildings, and Backside thereunto belonging, and all those houses within the narrow Bounds, that is to say, forty feet without the Brick Wall and all Houses, Edifices, and Buildings, and Lands within the said Bounds and Precincts, bounded by the House of Humphrey Vaughan in Russell-street, East, by the House of William Bard in Shandos-street, West, by the house of William Cresby in James-street, North, and by the House of Richard Tranton, in Bedford-street, South, be from henceforth for ever a distinct Parish of itself, and be called by the name of the Parish of St. Paul, Covent Garden."

Bedford House was demolished in 1704, when Wriothesley, second Duke, son to William, Lord Russell, beheaded in Lincoln's Inn-fields on July 21, 1683, and Rachael, his wife, removed to Bloomsbury. The "brick wall next the garden," which Strype speaks of, gave place to an avenue of trees, and that in its turn to Tavistock-row, which again has made room (1885) for an enlargement of the market area. Inasmuch as we gave a history of the market-place eight years ago,—see the *Builder* of January 20, 1883,—it will suffice to say here that to William, fifth Earl and first Duke, was granted a charter of right, in freehold, to hold a fruit and vegetable market; but not before 1754 did the square become covered with sale booths and stalls. The gradual establishment of the market may be followed in the views by Hollar and J. Seller (1640), Sutton Nichols (1720), J. Maurer (1741 and later), Sandby (1768 and later), Malton (1774 and 1796), and others, in the Crace collection. A water-colour (by Sandby?) in the Crowle Pennant, of Great Piazza, taken from Pitt's peruke shop, shows Tavistock-row, with its original façade of red brick, in the background. Thus it has come about that the Bedford (formerly Richardson's) and Tavistock hotels are all that remains of the Piazza, whilst in the former hotel the original attic story has been lately replaced by another floor with a row of dormer windows above. This clearly appears on a comparison with C. Campbell's drawings to scale. The National Sporting Club has recently been opened, in succession to the New Club at Orford House, formerly "Evans's." Doubtless the late Duke was well advised in his measures for extending the market space; yet the fact remains that the market, however good in itself, is in a position no longer

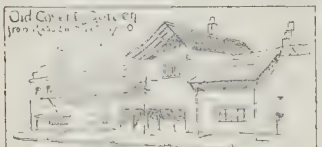
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* According to the plan, the "Sun" tavern, in "Brugs-street," stands where are now the offices of the *Builder*. The "Rose" and the "Windmill" taverns were at what are now the north and south corners of Drury-lane theatre, west front, respectively.

† *Vide* the epilogue to Dryden's "King Arthur," spoken by Mrs. Bracegirdle: "I've had to day a Dozen Billet Doux, From Fops, and Wits, and Cits, and Bow-street Beaux."



convenient. He offered to transfer it to the late Board of Works, but nothing came of it, no price was named. For the last extensions, some houses on the northern side of Russell-street and the western side of Bow-street were taken. The latter demolition included Nos. 3, 4, 4A, 5, and 6, Bow-street, whereof Nos. 4 and 4A formed the old police-court, established here in 1749. It was sacked and burnt by the "No Popery" rioters on June 6, 1780. We understand that part of the block still left at the corner of Russell and Bow streets (south west),—which includes No. 21, commonly known as "Will's" coffee-house, and "Tom's," Nos. 16-17 (now the National Deposit Bank),—belongs to the Clayton, and not to the Bedford Estate. And here we may point out that No. 21, Russell-street, the cook-shop, together with No. 20 and the adjoining premises in Bow-street, were formerly one house, and this, we are told, in Will's day. The late Duke bought the lease of the luckless Floral Hall, designed for Mr. Gye by Mr. E. M. Barry, and opened on March 9, 1860, and having given it a new south front, incorporated it with his market. A new flower-house stands at the south-eastern angle of the market-square; and the Hummums, which, with part of Little Piazza, was burnt on the morning of March 17, 1769, has again been rebuilt by Messrs. Wylson & Long, architects.* We published plans and a view on June 21, 1879, of the new police-courts and offices at the corner of Broad-court, Bow-street, designed by Mr. John Taylor, of the Office of Works, architect. Moreover, it has been stated that three or four years hence the Drury-lane Theatre site will also be taken for carrying forward these alterations of the estate.



To Thomas (Wriothesley), first Earl of Southampton, King Edward VI.'s Lord Chancellor, was conveyed in fee the town mansion of the Bishop of Lincoln, adjoining the remains of the Old Temple, without Holborn Bars, that had been the Templars' first settlement in London, 1118-84. Southampton House, as the Bishop's Inn was styled, is so named under date August 28, 1649. But thirteen years before that the then Lord Southampton had been minded to repair his fortunes by building smaller houses in its stead. His project, at first unfavourably received by the Council,—it "was dashed upon debate," writes Garrard to Lord Strafford on March 23, 1636,—had been carried out by the year 1657, and Southampton-buildings, mainly upon Lord Radnor's property, now occupies the site. It is commonly repeated that, in or about 1664, Thomas, fourth Earl of Southampton,—son to Henry, third Earl, who befriended Shakespeare,—bought the manor, or rather sub-manor, of Bloomsbury. The true story is as follows: By an indenture of 14 James I. (1617), Sir Henry Riche, Dame Isabella Riche, and her mother, Dame Dorothy Cope, sold to Phillip Gifford and Thomas Risley, trustees of Henry, Earl of Southampton, for 600*l.*,

"All that the manor and dissolved hospital, commonly called the manor or dissolved house of St. Giles-in-the-Fields, without the bars of London. . . . situate in the villages, hamlets, parishes, and fields of St. Giles-in-the-Fields, St. Pancras, Kentish Town, Maribone, St. Martin-in-the-Fields, Holborn, and Paddington. . . . except the tythes for a certain parcel of land called Bloomsbury, sold to one Samuel Knowles.

The two manors were bounded by Portpool (south-east), Duchy of Lancaster (south), Marylebone (west), and Tottenhall (north). In 1768 the fee-simple of Tottenhall was vested in Lord Southampton and his heirs.

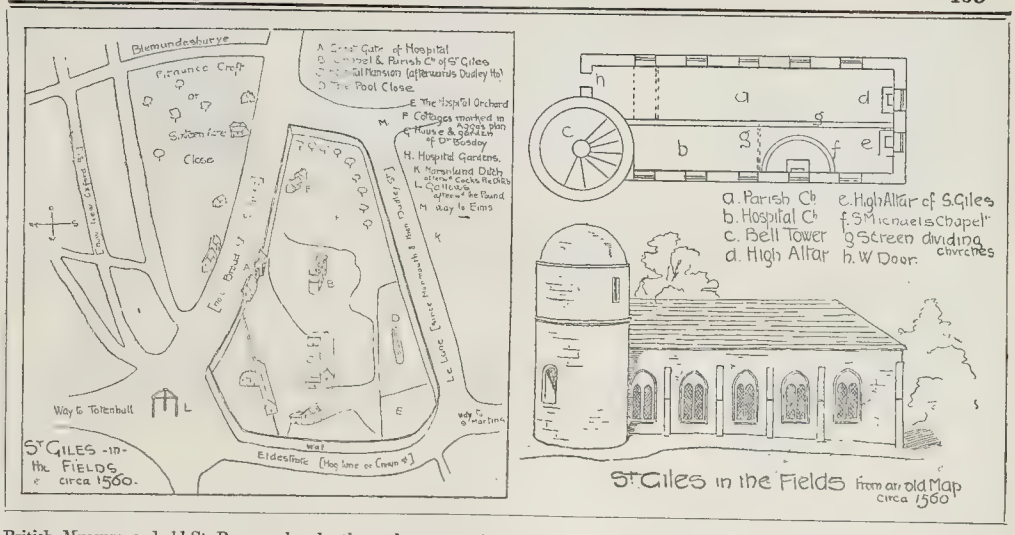
The parcel of land called Bloomsbury belonged to the northern portion of the ancient prebendarial manor of Ruggemere, upon the higher ground between the Tyburn and the Fleet, through which one William de Blemund, or Blemot, made a dyke or foss, east and west, that separated Bloomsbury from St. Giles's. William was manor-lord, *temp.* Henry III., and in some St. Giles's Hospital deeds witnessed by him, the ground is called Blemund's land or Blemund's fee. Queen Matilda founded the Leper Hospital in 1107; Henry VIII. made its chapel into a parish church, and granted the hospital to John Dudley, Duke of Northumberland, beheaded in 1533.

Bloomsbury, or Lomesbury, whence the royal stables were removed, *temp.* Edward VI., to Charing-cross, began to be built upon about 1625, when 136 houses were assessed. But the first of any importance is that which Thomas, fourth Earl of Southampton, built for himself, 1663-4, close to one of the Parliamentary forts thrown up twenty years before,—along the now northern side of Bloomsbury-square. Noorthouck says Inigo Jones designed it. Jones died in 1652: it may, perhaps, have been his pupil Webb's work. Pepys mentions the house in his Diary, under date October 2, 1664. There Evelyn used to visit the Lord Treasurer (see his Diary, July 21, 1664, February 9, 1663, &c.). The "good aire" he speaks of reminds us that northwards lay "Long Fields," that an almost clear view opened out from High Holborn,* and that next west, lay the ground where, fourteen years later, Robert Hooke, Curator of the Royal Society, built a town house for Ralph, afterwards Duke of Montague. In a letter to Dr. Fitzwilliam, Lady Rachael Russell describes the destruction of Montague House by fire on January 19, 1685-6. Having been rebuilt by Poughet, the Government bought it for 10,250*l.* of Lord Halifax for purposes of the British Museum, in 1753. Long Fields formed a favourite resort of duellists. In August, 1775, a duel with pistols was fought here by two "ladies of distinction," who had quarrelled over-night at cards.

By the marriage of Rachael, second daughter and heir to Earl Thomas, and widow of Francis, Lord Vaughan, with Viscount Russell, this property passed to the Russells. Sutton Nichols's view of about 1710 shows the house as having a basement, two main floors, and a central attic story. In E. Dayes's print of the square, engraved by Pollard and Jukes, 1787, the attic story is replaced, or concealed, by a balustrade. The itinerant milkmaid with two cows is a remembrance of a past custom. The square's three sides—as was the case at Lincoln's Inn-fields—have separate names: Vernon-street (south), Allington-row (west), and Seymour-row (east). Henry, third Earl of Southampton, married Elizabeth Vernon. Here Lady Russell died in 1723. On the passing of the Act for "fifty" new churches she and her daughter-in-law, the Duchess of Bedford, sold Plough-yard as a site for Hawksmoor's Church of St. George, Bloomsbury, his estimate for which, 9,790*l.*, was exceeded by only 3*l.* The Commissioners under that Act bought three acres of land behind the Foundling Hospital as burial-grounds for that parish and St. George the Martyr's, Holborn. In 1739 the houses assessed in Bloomsbury numbered 954, by 1829 they had reached to 1,976; amongst the earliest to be erected was the Bloomsbury market. Great Russell-street was built about 1670; over against Dyot-street (which has recovered its original name) stood Thanet House; Montague-mansions, facing the Museum-gates, has replaced a set of houses attributed to Wren. Russell-square dates from *circa* 1804; but Baltimore House (since subdivided) on its eastern side had been erected in 1763, when, and some years later, it and Whitefield's Tabernacle were, *teste* J. T. Smith, the only buildings in the open country between the

* See an account of the new premises in the *Builder* of January 7, 1888.

* "Surely the bitterness of death is past," said Lord Russell, on seeing his wife's early home, as he turned down Little Queen-street, in going from the Tower, to Lincoln's Inn-fields. "Long Fields" seems to correspond with the Bromfield and Goldbetersacre of Henry IV.'s time.



British Museum and old St. Pancras church. The traditionary situation of the Field of Forty Footsteps is just beyond the north-east end of Upper Montague-street (Woburn-square). We ourselves are inclined to place it between Mortimer-market and University College. Yet if the measurements given by Southey in his "Common-Place Book" are correct* it lay before the western end of new St. Pancras Church. In R. Wilkinson's map of 1799 a road is set out by name of "Duke of Bedford's New-road," almost due northwards from "Baltimore House" to "Somers-place" in what is now Euston-road. On the right is the Archery-ground (of the Toxophilite Society), on the left "Lamb's Conduit-fields." The fields to the right are bounded on the west by "Gore-



"street," named after Gertrude, daughter of John, first Earl Gower, and second wife to the fourth Duke of Bedford. Howland and Streatham-streets commemorate the marriage of the second Duke to Elizabeth, daughter and co-heir of John Howland, of Streatham, when he was created, June 13, 1695, Baron Howland, of Streatham. In like manner are commemorated the two wives of the sixth Duke (died 1839), Georgiana Byng, a daughter of the fourth Viscount Torrington, and Georgiana, daughter of the fourth Duke of Gordon; and the marriage of Francis, Marquis of Tavistock, in 1764, to Elizabeth Keppel, daughter of the second Earl of Albemarle,—her sister Caroline married Robin Adair. The southern side of Euston-square was re-named, about seven years ago, Endsleigh-gardens, after a Devonshire seat of the family, and Chenies-street is called after their place of burial. Most of the houses on the west side of Bedford-row belong, or did very lately belong, to the Harpur estate, forming part of the endowment of Sir William Harpur's school at Bedford; whilst the Lamb's Conduit estate was settled upon Rugby School by its founder, Laurence Sheriffe (died October 20, 1567), citizen and grocer, son of a butcher in Newgate Market. In 1800 the second Bedford House was pulled down.

In 1844-6 an extensive improvement was effected by clearing away the "Rookery" and laying out New Oxford-street, thus avoiding the circuit through High and Broad streets, past St. Giles's Church. That notorious quarter, where the Great Plague broke out, is reputed to have been first colonised by Irish people, *temp.* Elizabeth. Dyott, Bainbridge, and Buckeridge streets were named after their respective owners in Charles II.'s reign. An unpublished plan, in the British Museum, shows that in 1813 some of the land belonged to Lord Maynard's estate. The statute 29 Geo. II., c. 88, established a new road,—lately subdivided into Marylebone, Euston, and Pentonville roads,—from Lisson-grove to the "Angel Tavern," Clerkenwell. Amongst its advantages held out in the Act were that it would obviate the necessity of driving cattle from the western roads through the streets to Smithfield, and in times of threatened invasion would "form a complete line of circumvallation," and serve for a direct military route towards the Essex coast. On June 29, 1761, was opened Dingley's City-road further eastward to Moorfields. The fourth Duke of Bedford stoutly resisted the project to make the "New-road," as a deterioration of his property and enjoyment in Bedford House. A plan in the *London Magazine*, 1756, shows that the land northwards from Bedford House to the now Euston-road was then owned by Mrs. Capper, the Corporation, and the Dukes of Newcastle, Bedford, and Grafton. The last-named espoused the scheme. The statute required that a clear space of 50 ft. should be retained along each side of the whole thoroughfare. This space has been gradually encroached upon, and particularly of late years, with the result that Marylebone-road alone remains to show us what might and should have been the condition of this the first boulevard laid out in London.*

ROYAL CALEDONIAN ASYLUM.—At a general quarterly meeting of the Royal Caledonian Asylum, held on the 4th inst., at the Scottish Corporation Hall, Crane-court, Fleet-street, Mr. Alexander Ritchie, C.C. (of the firm of Steven Bros. & Co.), was unanimously appointed honorary treasurer of the Asylum, in the room of Sir Patrick Colquhoun, Q.C., deceased.

* About three-quarters of a mile north of Montague House and 500 yards east of Tottenham Court-road.

* On March 23 last the County Council gave notice for removal, within three months, of the gates across Torrington-place, Gordon-street, Upper Woburn-place, and Sidmouth-street, upon the Bedford and Harrison estates.

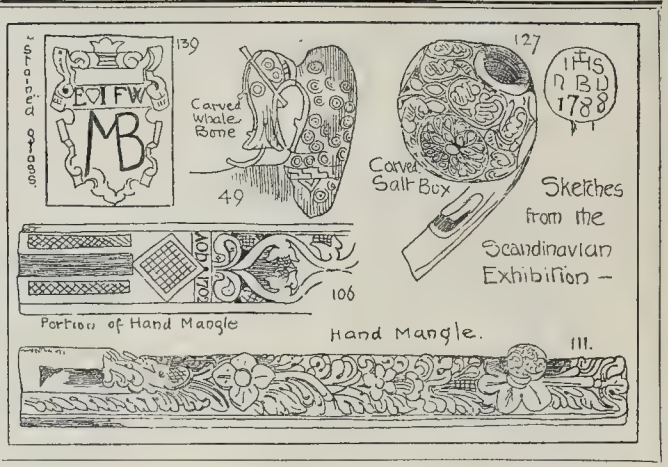
NOTES.

THE English contribution to the Architectural Division of the Berlin International Art Exhibition has at last been hung, but up to date the names of the artists exhibiting do not figure in the catalogue, nor are labels attached to their work notifying the authorship or the subject illustrated. The unpunctuality in this section has been marked and must be regretted; with whom the fault lies we do not know. It will, however, be excused now that the section proves to be such a very satisfactory one in every respect, and, above all, the only one in the Architectural Division which fairly represents its country, and even stands in this point proportionally on the same height as the sections of such countries as Spain or Italy do among the oil paintings of the Exhibition. Not only do we find some example of nearly every kind of modern work that is being done at present in England, in this small collection, but also a good illustration of the various ways of representing architectural work on paper in England, both in perspective and elevation, in outline brown or black, hatched, tinted, and coloured. Line perspectives predominate, but are by no means alone in the field. As was only to be expected with the short notice given by those organising the division, most of the drawings exhibited at Berlin are old friends, work that has either already hung on the Royal Academy walls or has found illustration in our pages. As to the hanging of the work we cannot say much in its favour, it seems to have been done without system; works of well-known merit having been "skied," others of inferior quality having in many cases had room found for them on "the line"; and then, again, owing to their late arrival and their unexpected number, they have had to be somewhat scattered about, the main contingent, it is true, being placed in the "architectural room," but a good many stray drawings also being visible in distant parts of the Exhibition, filling up gaps at random, and quite out of place among their surroundings. Among the drawings exhibited are Mr. Waterhouse's Natural History Museum and Manchester Municipal Buildings; Mr. Collcutt's Imperial Institute, the English Opera-house, and Bechstein's pianoforte warehouse; Mr. Norman Shaw's Scotland-yard building; Mr. Pearson's perspective and elevation of Truro Cathedral; Mr. Aitchison's "Arab Hall" at Sir F. Leighton's house, and the Royal Exchange Assurance Company's buildings; Mr. Rowand Anderson's Scottish National Portrait Gallery; Col. Edis's Junior Constitutional Club; Mr. Robson's Reading-room of the People's Palace; Messrs. Aston Webb &

Ingress Bell's Birmingham Law Courts; Mr. Mountford's Sheffield Municipal Buildings: various houses by Messrs. Ernest George & Peto. Among the other architects represented are Mr. Basil Champneys, Messrs. Somers Clarke & Micklethwaite, Mr. Jas. Brooks, Mr. John Belcher, Mr. R. T. Blomfield, Mr. E. J. May, Mr. J. J. Stevenson, Messrs. Burnett Son & Campbell, and the late Mr. J. D. Sedding.

THE often-proposed scheme for connecting the rivers Rhine, Weser, and Elbe by canals, which would give Germany a complete water-way connexion from east to west (commencing at the Vistula and ending at the Rhine), is at last going to be taken in hand, the Emperor having taken the matter up. The proposed new line will start near Magdeburg on the Elbe, will pass Hanover and cross the Weser at Minden, reaching the Rhine-Ems canal (the cutting of which has already been sanctioned by the Government, and is to be commenced at once) northwards of Münster, and thus reaching the Rhine near Dortmund. The length of the new line will be 330 kilomètres. The section of the canal will show a depth of 2½ mèters from water level to bottom, a width of 26 mètres at water level, and a width of 16 mètres on the bottom, thus giving the sides and embankments an incline of one to two. Ships of 600 to 800 tons (1,000 kilo to a ton) will be able to make use of the canal. The present rough estimate indicates 350,000*l.* as the probable cost, which seems, however, a very insufficient sum for such a work.

ACCORDING to the eighth annual report of the Patent Office, which has just been published, the applications for patents made during last year reached to 21,307 in number, as compared with 21,008 deposited in 1889. So we find that the yearly increase, counting from 1885, under the new law, is not maintained at a corresponding rate. Two-thirds of the patents come from England and Wales, the United States contribute 2,597, Mexico, Siam, Servia (for the first time since 1883, at any rate), Java, China, with the Sandwich and Canary Islands, send one a-piece. The receipts from patent fees (165,408*l.* 4s. 8d.), designs fees (4,521*l.* 8s.), trade mark fees (16,427*l.* 12s. 10d.), and sale of publications (6,249*l.* 12s. 3½d.), leave a net surplus of 109,366*l.* 8s. 4½d. The charges for salaries and printing amount to 52,527*l.* 1s. 1d., and 17,000*l.* respectively. In the preceding two years one half of the patents applied for were ultimately abandoned; the 4,949 patents lodged in 1877 and kept in force to the end of the 8th—14th years, respectively, show a gradual decline of from 14·2 to 9·8 per cent., in respect of such extension. As many as 94,447 readers visited the Free Library in Southampton-buildings; of whom 28,576 availed themselves of its use between the hours of four and ten p.m. A total of 240 names were enrolled upon the Patent Agents register on the last day of the year. Fresh sets of rules, printed with the report, were made in the course of the twelve months under review. Of the total 22,553 designs applied for (15,000 of them being for textile goods) 1,620 were objected to, and nearly all of these latter were at once withdrawn, only fifty-four having been absolutely refused. The trade-mark applications fell from 11,316, in 1889, to 10,258; 207 applications were received under the provisions of the International Convention for protecting industrial property, and mutual protection, under the Act of 1883, was extended to New Zealand, San Domingo, Surinam, and Curaçoa. In April, a conference at Madrid of delegates from states forming the union agreed to certain draft projects for repressing false indications of origin upon merchandise, for establishing an international register of trade-marks, and for arriving at a common interpretation of certain articles in the International Convention of 1883. On that occasion the Comptroller-General represented this country.



THE annual report of the Chief Inspector under the Alkali Act, 1881, contains one point of interest to the general public. He states that though he has not to do officially with the smoke question generally, yet that it is constantly brought to his attention. He therefore states it to be his opinion, not that the ordinary domestic fireplaces should be improved, but that they should be abolished, and that houses should be heated by a single heating apparatus. This opinion is entitled to weight, being that of a gentleman who has constantly to consider questions as to nuisances arising from furnaces used for the purposes of chemical manufactures. Mr. Fletcher further states that his private residence was entirely warmed in this manner, and that he burned no bituminous coal in his house. On the other hand, he tells us nothing as to the ventilation of his house. The opinion is, of course, in the nature of an *obiter dictum*, to use a legal phrase, and too much weight, therefore, should not be attached to it. On the other hand, we have here not only a definite opinion by a person well qualified to express a sound judgment, but also the fact that the opinion has already been tested by a continuous experiment, and with success.

THE Metropolitan Railway has hitherto been very exempt from accidents. The public were therefore surprised last week to hear of an accident on the northern extension, which might have been serious. Little astonishment, however, can be felt in regard to it, and it is pretty certain that this one will not be the last. Some eighteen months ago the Metropolitan Railway began to run what are termed express trains. They are so called, not on account of any speed which they possess, but because they do not stop at all the stations. But they are run on the same set of rails as the slow traffic, and they have to be "sandwiched in," to use a familiar expression, between the ordinary trains. Nothing can be more dangerous, or more certain sooner or later to lead to accidents. The least hitch, and a fast train may run into its slow predecessor. Again, the evening express starts from the ordinary departure platform,—a very dangerous thing to do, and which will probably lead to an accident. At present, indeed, the northern extension of this railway is worked in a manner open to much criticism.

A SMALL but interesting collection of Scandinavian objects has been brought together by Mr. Alfred Cocks, and is now on view at the rooms of the Archæological Institute in Oxford-mansions. Denmark, Norway, and Iceland are all represented, the largest number of exhibits coming from Norway, and there are also a few objects from Sweden and Russia, and Swedish Finland. We give a few sketches, which serve to illustrate the almost barbaric richness of some of the objects of common and daily use. The hand-mangles (Norwegian) are particularly gorgeous, both in the carving and the coloured decoration. No. 111 is a good example of this work, the predominant colours being green and red. No. 106 is a portion of another decorated with incised lines and conventional foliage of a Renaissance type and bearing the date 1702. Many of the others are dated, nearly all being of the eighteenth century. The carved salt-box "carried in the belt of Salters, for giving salt to each of the cattle, sheep, goats, &c., as a reward for coming home in the evening," is a further example of delicate wood-carving. The curious fragment of whalebone also given amongst the sketches was found in a barrow, and is of unknown use, but is interesting as an example of the early and conventional treatment of the dragon's head. The fragment of stained glass is said to have been the work of one of the survivors of Sinclair's Expedition "which was destroyed in Eudbrandsdalen, in 1612." It has, for some unaccountable reason, been removed from an old house in Vange and was purchased in the town. Perhaps its value is more historical than as a design, but it is a very fair specimen of a type of work which was common enough in our own country at the time. Besides the objects already noted there is some tapestry on the walls with religious subjects treated in a very quaint way, and also a very large number of objects of every-day use and of ornament which, although perhaps hardly of sufficient importance to mention here, will undoubtedly prove interesting to those wishing for an insight into this comparatively unknown corner of Europe.

A PROPOSAL made by the late Mr. Dick Peddie to erect a winter garden in West Princes-street-gardens, Edinburgh, has been revived, and the City Superintendent of Works has prepared plans which are under the consideration of the municipal authorities. The site of the proposed structure is at the extreme west end of the gardens, and the plan prepared by Mr. Morham is upon the same lines as that of Mr. Dick Peddie,—viz., a glass dome with flanking pavilions. Objection was taken to the original proposal on account of the alleged detrimental effect of such an erection to the amenity of the gardens. It was contended that however useful a building of the kind might prove, it would be an eyesore under the shadow of the Castle-rock, and lend an uncomfortably artificial, nay vulgar, aspect to the gardens. The same objections are again brought forward, and it is further urged that a sum of about 10,000*l.*, which it is estimated that the steel and glass structure would cost, would form a considerable instalment towards the erection of a town-hall, which the city is much in need of, and which would, of course, have to be

placed on another site. In our opinion, the fewer erections there are in these gardens the better, as regards their appearance. It does seem somewhat inconsistent that while strong objections are raised in regard to the Railway Company erecting buildings upon these gardens of however artistic a character, that an attempt of the above kind should be made. The public convenience and pleasure are aimed at by both sets of promoters, and the objections are similar in each instance.

THERE is a good deal of what we should call *chic* in the collection of sketches in Cairo and on the Nile, by Mr. A. N. Roussof, now being exhibited at the Society of Fine Arts' Gallery. Mr. Roussof knows how to produce brilliant and striking effects of colour, as in "Yellow and Black" (20), named from a woman dressed in that combination who comes down a Cairo street in a flare of sunlight, and there is a very bright effect of daylight and air in some of the sketches, such as "Old Mosque in Boulak" (2) and the "Water Carrier" (33). The two pictures called "Water-carriers in the Desert" and "A Gossip in the Desert" (18 and 36), giving the effect of figures shown almost as silhouettes on a surface of red sand, are original in appearance but strike us as rather cooked effects, by the help of the black border which surrounds both of them. "A Mosque Door" (39) is an interesting and very real bit of study of architectural detail. But the impression made by the collection is rather that of drawings thrown off according to an acquired (and very clever) trick of effect, than of serious study of the scenes pourtrayed.

AT the Goupil Gallery is a selection of works by Mr. J. Lavery, the author of the brilliant lawn-tennis picture under the title of "Sunlight," which attracted so much attention in the Academy two or three years ago. Looking at the general style of the pictures, one would expect to find an accent over the *e* in the artist's name; he is however not a Frenchman but a Glasgow man, though the influence of French teaching and study is obvious. A good many of the smaller works, such as Nos. 2 and 4, are sheer "impressionism" (in spite of the disclaimer in the preface to the catalogue), and most of them show that ostentatious contempt of finish which is one of the affectations too prevalent in contemporary French art. But the large equestrian portrait of a lady is a noble work in dignity and breadth of style. The figure called "Ariadne," practically a nude study, is fine both in poetic feeling and drawing, and there are other sketches, especially portraits, which show a great deal of power: also a large pastel, "The Siren," a nude study particularised by a remarkably powerful head, expressive of the character and demoniac nature of the Siren. Mr. Lavery is an artist of real power; it is to be hoped he will not allow himself to be entangled in the prevalent affectations which are doing so much to spoil the art of painting.

ARCHITECTURE AT THE ROYAL ACADEMY.—VII.

1,845. "New Houses, Frognal-gardens, Hampstead;" Mr. James Neale. A large and finely-executed pen-drawing of two houses of the villa class, treated with a certain amount of variety. No plan is given. The drawing is reproduced in a lithograph illustration in the present number, with a description by the architect.

1,847. "New Schools, Plough-road, Clapham Junction;" Mr. T. J. Bailey. A tinted perspective view showing that the style imposed by Mr. Robson on the London Board School is more or less kept up by his successor. One angle of the building runs up into a tower with a rather picturesque termination; the plan is too small to see, at the height at which the drawing is hung, what is the motive for the tower: it groups picturesquely with the rest. The execution of the drawing is slight but artistic, and assists the effect of the design.

1,848. "47, Berkeley-square: Dining-room;" Messrs. Ernest George & Peto. Tinted elevations of portions of the dining-room, showing a wainscot treatment of Elizabethan character, and the fireplace and over-mantel, with details, shown larger size. A drawing also of a portion of the ceiling is given, a very rich and effective design. The end of the dining-room appears to be shown in the principal elevation, divided into three arches, of which the folding doors occupy the central one, the side ones containing shelves for porcelain. We should like better to see the actual doors cut off with a square head leaving the arch-head filled up solid. Folding doors cut to a semicircular arch form at the top always have an awkward look when open; unless indeed these are intended to slide, which may be the case.

1,849. "In the Garden of the Hôtel Métropole, Brighton;" Mr. A. Waterhouse, R.A. Are hotels arriving at the dignity of having their own chapels attached to them? The building shown in the drawing, with a high-pitched roof, large windows, and a small clock-tower at the angles, suggests the idea of the Hôtel Métropole chapel. It may perhaps be an entertainment-hall. The drawing, a water-colour, is an effective and powerful one.

1,850. "Sketches at Mansfield College, Oxford;" Mr. Basil Champneys. The stalls and reading-desk from the chapel (apparently), and an interior of the library. The canopy work over the stalls, taking the form of an octagon richly traceried, is very effective. The woodwork of the library looks rather thin and meagre. The drawings are by Mr. Davison, who seems to have become an institution for architects wishing to be represented in the Architectural Room. We should like to see a larger portion of architects making their own drawings.

1,852. "Woodcroft, Larbert, N.B.;" Mr. T. L. Watson. Again by Mr. Davison: charming little drawings, but the work owes its place more to the drawing than the design, which is pleasing enough but not in any way remarkable. This is what so much of the Academy architectural room comes to; an exhibition of draughtmanship.

1,853. "The National Gallery, with Restoration of Wilkins's supposed Original Design;" Mr. George Aitchison, A.R.A. We do not know what are the documentary data (if any) for this restoration, which is certainly a great improvement on the building as existing. The principal differences are these: The pedestals on each side of the central dome, and those over the columned projections halfway between centre and wings, are crowned with sculpture. This, at any rate, was no doubt intended; the intermediate projections also are shown a little narrower and the columns closer together, the doors under them being smaller. The chief alteration is at the wings. The "pepperpots" disappear. The inner couple of pilasters beneath them are retained and a similarly spaced couple placed at the outer angles of the building, which are brought forward instead of being set back as now, and the centre portion of the wing has a colonnade of six fluted columns with a low pediment, and over this is a smaller dome at each wing, somewhat of the same character as the central dome. This treatment of the wings is the great improvement, and makes all the difference in the effect of the façade.

1,855. "House at Copsall;" Mr. F. M. Simpson. A pretty specimen of what may be called the modern old-fashioned house, with a plan added, of which however details cannot be seen. The pen-drawing is in an agreeable and unpretentious style, but would have been all the better without the row of little round bushes on stalks, like mops stuck in the ground, in the lower view.

1,858. "Remains of Mosaic Figure in Dome of Monastery at Daphne, Athens;" Mr. Sydney H Barnsley. A larger scale drawing than those of Mr. Schultz, showing the upper part of a figure with gold nimbus, a finely-designed head, and drapery treated with little colour but in a broad and bold manner.

1,859. "Proposed House at Eastbourne;" Mr. R. A. Briggs. A broad low Gothic house treated in a very solid manner; projecting octagon bays with a large mullioned window and battlemented finish, on each side of the front door, which is recessed beneath a deep elliptical arch connecting the two bays. The treatment over this is simple and symmetrical, with three small gables and windows arranged beneath each. Part of the house at the back is carried up in more or less tower-like form. Two plans are added.

1,860. "View of Nave, &c., St. Edmund's, Bungay;" Mr. Bernard Smith. A rather scratchy and splashy pen-drawing, though not ineffective. The building is treated with large and elaborately traceried windows at the side, divided in the middle of their height by a battlemented transom and foliated lights. The western portion is treated separately as a kind of two-storied porch, with the doorway placed under a lofty wall arch, the upper portion of which is filled with canopied niches. The angle buttresses of this portion develop into rather big octagonal turrets above. Want of repose and refinement of detail is the fault of the design.

1,861. "Holy Trinity Church, Shoreditch, and Lodging-house adjoining;" Mr. R. J. Lovell. This seems an ingenious attempt to combine provision for body and soul in one building, the club-room being below and the church over it and reached by another door opening on stairs. The elevation is a red-brick one with a simple Gothic treatment suitable to the occasion. The row of windows running right across on the first floor, under a pointed wall-arcade, has a good effect, but it does not correspond with the windows as shown on the first-floor plan.

1,862. "Hymer's College, Kingston-upon-Hull;" Messrs. Botterill, Son, & Bilson. This is an effective drawing in brown monochrome, a little too much stippled and dotted; the building, which has been somewhat altered from the original design, shows a deeply recessed centre with two advanced wings and a screen connecting them; the recessed portion has a row of large late Gothic mullioned windows: the general character of the whole is Elizabethan. The building has quite a school character, and is pleasing and picturesque in appearance.

1,863. "Chartres Cathedral: North Porch;" Mr. H. Wilson. A water-colour drawing remarkable for its piquant colour and the manner in which the texture of the masonry and sculpture is indicated.

1,864. "House at Hampstead;" Mr. E. J. May. A house-design full of character; Gothic in feeling but not to be reduced to any special style. The manner in which the windows are got in on the angles of the block on the left of the doorway, and the octagon bay with buttresses at the angle of the library, are among the picturesque incidents in the design. A plan of a sufficiently legible size is added, with scale, and north and south point marked, as it always should be on a house-plan.

1,866. "Surrey and Mowbray Houses, Victoria-embankment;" Mr. John Dunn. Red brick Gothic buildings in the same style as some others on the Embankment; not remarkable in any way, but in harmony with the situation.

1,867. "A Renaissance Pavilion;" Mr. Ernest Rüntz. A large and beautifully-drawn line elevation, a kind of drawing of which we should be glad to see more in the architectural room. It represents a portion of a mansion with a mansard roof over; a Corinthian order is employed in the ground story, a somewhat similar order above but with the lower portion of the columns divided off from the fluting by a moulding and carved, the design varied in each column. The elaborate decorative details in every part are drawn and finished with conscientious care, and the sculpture well put in. The drawing is highly creditable to its author.

1,868. "St. ——, Nottingham, design in stone, east elevation;" Mr. J. E. Newbury. A design by either a pupil of Mr. Pearson's, we should imagine, or a close student of his work. It is a solid little design, slightly tinted to represent a yellowish stone; separate lancet windows between buttresses in the lower portion, a series of short lancets in the upper portion, grouped under a large wall-arch rising from the ground. It is flanked by massive buttresses with solid pyramidal pinnacles slightly convex in outline. A circular vestry with a pyramidal red-tiled roof is introduced on the south side, and a saddle-back tower is indicated in the background. If we remember right a side elevation of the same design was in a previous exhibition. It suggests the idea of being a study rather than an executed building.

1,869. "West Front, Poitiers;" Mr. C. E. Mallows. A pen-sketch in which the idea of strong sunlight is well conveyed.

1,870. "Munstead Corner, Godalming;" Mr. E. L. Lutyens. A picturesque house, the upper

part timber, reposing on a wall of somewhat rough masonry below. A plan is added. There are various picturesque little points in the house; such as the manner in which the verandah before the drawing-room is worked in under the main beam carrying the timber work, and the little octagon thrown out of the drawing-room wall, with a small window in the upper part of it, to give a look-out in that direction. The author seems to be making a reputation for the treatment of this class of picturesque small country house.

1,871. "Design for Proposed Polytechnic at Battersea;" Messrs. Morris & Hunter. This is a long low elevation, in line, of the authors' competition design for the Battersea Polytechnic; rather mechanical, but treated with breadth and simplicity. On the ground-floor is a long range of large low circular-headed windows; the central entrance-arch ranges with these, accentuated by partially-rusticated columns on each side. The upper windows are ordinary square-headed lights grouped in threes, with a slightly-marked pediment over the centre one. For a building of the kind, where economy was to be an object, it is a suitable and sensible elevation, not without effectiveness.

1,872. "The Hall of Lincoln College, Oxford, showing the restoration of the ancient roof, windows, and panelling;" Mr. T. G. Jackson. The roof has curved braces with tracery in the spandrils, the wall lined with panelled wainscot part way up the wall; the square heads of the windows, with two lights and late tracery in the heads, rising a little way above the wainscot line.

1,874. "Mongewell, on the Thames;" Mr. R. S. Wornum. Is this a new house, or an old one added to? It is a long straight-lined house with sash windows and a colonnaded loggia on the ground-floor between the wings; a lead-covered cupola rises behind. The drawing is a bright-looking one in pen-line, with a great deal of untouched paper left above and below, which gives it spacious effect, but some part of this space might have been well occupied by a plan.

1,876. "The New Library, Uppingham School;" Mr. T. G. Jackson. A pen-line interior: the ceiling is formed as a slightly-pointed barrel-vault, with open timber tie-beam principals beneath; apparently the ceiling follows the line of curved braces below the principal rafters, and would leave a flat soffit from their foot to the wall, but the ceiling at this point is opened as an arch between the principals, and lighted from windows at the back of these arches. There is a little decorative plaster (?) work round these openings, and a single conventional flower decoration in the middle of each compartment, higher up. The book-cases are arranged at right-angles to the wall and crossing half the room, under each principal. The whole makes an interesting interior well suited to its purpose.

COMPETITIONS.

NEW MARKETS, HALIFAX.—The Markets Committee of the Halifax Corporation, who have been assisted by Mr. George Corson, of Leeds, on the 4th inst. selected as the designs for the new markets those of Messrs. Leeming & Leeming, of Westminster. The plans bore the motto, "Auld Lang Syne." The second premium, 50*l.*, has been awarded to Mr. C. F. L. Horsfall, of Halifax ("Revenue"); and the third, 30*l.*, to Mr. T. C. Cunnington, London ("North Light"). There were altogether ten sets of plans sent in competition. The total cost of the buildings was not to exceed 40,000*l.*, and the estimate of Messrs. Leeming & Leeming is under that amount,—viz., 34,098*l.* 5s. 4d.

OLDBURY SEWAGE PURIFICATION.—At the last meeting of the Oldbury Local Board the Highway and Sewerage Committee reported having had interviews with three civil engineers as to laying down an improved system of sewage treatment at the outfall works, viz., Mr. J. E. Wilcox, Birmingham; Mr. H. Bertram Nichols, Birmingham; and Mr. C. H. Beloe, Liverpool, and they had invited those gentlemen to prepare and submit competitive plans, section drawings, specifications, estimate of works, &c., to carry out the necessary alterations and improvements at the farm of their respective schemes. They (the Committee) asked the Board to approve and adopt their action, and to offer the following premiums to the competitors, viz., the appointment of an engineer to carry out the work at a remuneration of 5 per cent. upon the expenditure; second, 40*l.*; third, 30*l.* The report was adopted.

PAINTINGS AT THE BERLIN INTERNATIONAL ART EXHIBITION.

THE pictures at the Berlin Exhibition are arranged according to the presumed nationality of their painters, those of Germany being subdivided into the schools of Berlin, Munich, Düsseldorff, Karlsruhe, Dresden, and Weimar.

In the first room on entering, which is the Salon of Honour, are hung what may be termed modern historical pictures, such as those by Anton von Werner, the Court Painter of Berlin, one of which is "The Crown Prince Frederick William Viewing the Corpse of General Abel Douay at Weissenburg," an incident of the Franco-German War, showing the Prince regarding the remains of his adversary in the interior of a cottage,—a good, solidly-painted piece of work. The other paintings here by von Werner are "The Opening of the Reichstag by the Emperor William II. on June 24, 1888," and "The Coronation of King Frederic I.," both sketches in oil, the latter for a wall painting in the Zeughaus. Both of these show the painter's skill in the delineation of a crowded assembly, with the accompanying pomp of a state pageant. Though professedly only sketches, like most paintings of the class by Court painters, they promise a greater degree of interest than that afforded by association. A pencil drawing by von Werner of the late Field-Marshal von Moltke, made after death, is an admirable piece of work, and is already extensively popular in the photographic shops of Germany.

Portraits of the Emperor William II., the Empress Augusta, and the Empress Frederic, by von Angeli, of Vienna, are also fitly hung in this room, and well maintain the artist's reputation.

Of quite a different nature is the large picture by F. Keller, of Carlsruhe,—"Emperor William the Victorious,"—an allegorical painting representing the old Emperor in a quadriga, with accompanying figures of symbolical character, somewhat vulgar in its sensationalism and garish in colour, leading one to think what a very different treatment of such a subject a master like Mantegna would have given us.

As the next room is devoted to the work of Hungarian painters, we may with advantage review the representation of foreign pictorial art before touching on that of the Fatherland.

The Hungarian pictures, as might be expected, reflect very strongly the methods of Munkácsy, three of whose paintings are exhibited, and exemplify the artist's mastery in the representation of rich and lustrous drapery and accessories, as in the portrait-painting and the example of *genre* he has sent.

A very fine portrait is that of Dr. Lorenz Schlauch, Bishop of Great Wardein, by Eduard Ballo, of Budapest, a seated figure in purple dress with gold lace collar. The head is finely painted, and does justice to the striking countenance of the ecclesiastic, while the costume is a worthy example of the Hungarian skilful treatment of such subjects. Another excellent portrait is that of the Gräfin von der Gröben, by Leopold Horovitz, in which the pose of the lady, a half-back view with the head turned in profile, as well as the rich lustre of the costume, aid largely in forming a remarkable painting of a beautiful woman. As a good example of *genre* may be mentioned Alexander Bihari's "Before the Magistrate," lent by the King of Hungary, depicting an incident of rural life; a party of strolling musicians, whose disagreement has resulted in the fracture of the fiddle of the ragged individual who is stating his case before the village magistrate, an official whose patched coat unites with the general character of the habiliments of the suitors, to express, probably, the artist's idea that rich and splendid costumes are not always necessary for a Hungarian painter. The expression of the different faces is well conveyed, and as an example of *genre* the picture is undoubtedly good. Of an entirely different character is the picture by Árpád v. Feszty, representing "The Weeping Women at the Sepulchre," also lent by the King of Hungary; this is a very remarkable picture, the *abandon* of the impulsive Magdalen being finely contrasted both by attitude and colour with the more restrained grief of the other figures. In landscape, of which there are comparatively few examples amongst the Hungarian pictures, we may notice Béla von Spányi's "Evening-tone," also lent by the King of Hungary, a very sweet harmony of low, soft tones and evening light, and the "Shepherd's Fire" of Arthur Tölgyessy, a somewhat similar subject, well expressing the quiet and softness of evening light. This, too, is lent by the King.

Spain, as we noted in our former article, easily carries off the palm for excellence in her exhibition of pictures. Amongst the most charming of all the pictures in the exhibition are the paintings of children by Antonia, Countess Bañuelos, of Madrid, four of which are hung, one having been lent by the Queen of Spain. The life-like interest and expression conveyed are worthy of all admiration, while the rich red background gives a high pictorial quality to these striking paintings. The picture by Salvador Martinez Cubells of "Doña Inez de Castro," lent by the National Gallery of Madrid, is one of the remarkable series of historical paintings in which the Spanish collection is so notably rich. The wasted and shrunken figure of Doña Inez, half concealed by her veil, receiving homage, is well contrasted with the vigorous figures of the other personages. In richness of colour and admirable draughtsmanship this picture takes a very high place.

"The Convention at Caspe," by Andres Parladé, of Seville, is another of the notable historical pictures by Spanish artists, the varied colouring of the costumes of bishops, senators, and monks, lighted only by a window high up in the chamber wall, being well set off by the deep shadows of the background. Again, Emilio Sala's "Expulsion of the Jews from Spain—1492" is one more of these historical paintings which appear to be the strongest efforts of modern Spanish artists. As a contrast to these in every respect, we have such a picture as Francés y Pascual's humorous piece of open-air *genre*, "The Bull's Coming! a scene in the street of San Juan de los Reyes in Granada." A bull is slowly coming round the corner at the left of the picture; in the centre of the street is an unhorsed, covered market-cart, filled with refugees, whilst others are climbing to the top, and, with the usual contemptuous attitude of the modern Iberian towards the military, the painter introduces a soldier hastening to shelter behind the cart. José Villegas sends two studies for a Venetian historical picture, one of "A Doge," the other of three "Senators," which are admirable pieces of draughtsmanship and character delineation. Joaquin Lugue Rosello's "Roman Peasants at Prayer" is a broadly-painted picture of countrypeople halting at a wayside shrine, the prevailing grey tone suggesting evening time. The two paintings by José Gallegos, of a "Wedding in the Sacristy of the Cathedral of Seville," and "Adoration of the Blessed Sacrament," are examples of a Meissonier-like treatment, to which the fame of that master naturally leads his would-be followers.

The collection of English pictures is one which we may feel fairly represents our present position in oil-painting. It is hardly necessary for us to describe in detail such well-known pictures as Sir J. E. Millais' "Last Rose of Summer," Sir John Gilbert's "Sir Lancelot of the Lake," Herkomer's "Our Village," or his portraits of his father and Mr. Ruskin; Sir Frederick Leighton's "Sibyl," Poynter's "On the Temple Steps," Richmond's "Venus and Anchises," and his portraits of Viscountess Hood, Charles Darwin, and the Bishop of Durham. Alma Tadema, Aumonier, Boughton, Hon. John Collier, Walter Crane, Mrs. Crawford, Stanhope Forbes, Frank Holl, Yeend King, Sir James Linton, Henry Moore, Ouless, Pettie, Mrs. Normand, J. J. Shannon, E. A. Waterlow, Watts, and Wyllie are also well represented, so that the versatility and the strength of English oil-painting are adequately exhibited, except in landscape. In water-colour and in black and white, the prestige of English art is worthily maintained by such workers as E. A. Abbey, Aumonier, John Fulleylove, Sir John Gilbert, Wilfrid Ball, H. Batley, Axel Haig, Harry Hine, David Law, Mortimer Menpes, and others; while our sculpture is represented by works by Bruce Joy, Nelson McLean, and Roscoe Mullins.

The position of Italy, as evidenced by the pictures in this exhibition, is not one of which our traditional ideas of that country's supremacy in art might lead us to form an expectation. Such a picture as Ettore Tito's "Washerwomen of Garda," representing a number of

modern Italian women washing clothes in a stream in continental fashion, full of blazing and *bizarre* colour, is clever and showy, but forced and meretricious, and in this is but a type of many of the modern Italian paintings. Other examples of similar character are Paolo Michetti's "Corpus Christi in the Abruzzi" and "The Serenade," in which the slap-dash execution of the painting is not even sufficient for the author's love of sensation, but needs to be supplemented by the eccentricity of the frames, which are executed in carved wood and painted to represent rusty iron, with chains, bars, and balls as ornaments! The same painter's "Peasants of the Abruzzi" has a frame of bronze and gold, which in only a slightly lesser degree transgresses the limits of good taste. Giovanni Segantini sends a large number of pictures showing various phases of life in the Engadine district, which are refreshing in their contrast to those we have already mentioned, and show strong marks of the influence of the realistic school of French landscapists. These two painters may be taken as typical examples of the majority of the Italian pictures, which, for the most part, follow one or the other of these lines. Both are realistic, both lacking in light, the want of which the slap-dash school endeavours to supply by forced and sensational colour.

The Belgian pictures are notable for the variety of the subjects chosen and of the treatment adopted in their representation. Thus we have such a picture as that by Albrecht de Vriendt, "How the Gauls did homage to the Infant Charles V.", a historical picture with a learned display of archæology, both in costume, physiognomies, and technique. In contrast to this we may take Hans von Leemputten's "Palm Sunday," a representation of a modern Dutch rural congregation coming out of the village church, in which the blue and green predominating in the costumes of the country people are skilfully opposed to the red walls and roofs of the church and houses, a quiet and cool, if somewhat hard, picture of bucolic respectability. Then the "Quiet before the Storm" of Arthur Bouvier, a well-painted seapiece with fishing-boats running for the shore, gives us quite another phase both of subject and treatment. Again, Xavier de Cock's "Cattle Swimming the Lys," another threatening storm effect, is yet once more different both in tone and scene.

Léon Brunin's "At Dawn" is an example of historical *genre*, a scene in an armourer's shop, full of fine, deep, rich colour, of armour, brass and stuffs. Wilhelm Geet's picture of "The Incantation" is another well-painted, highly-finished work of similar class, showing a group of maidens in fifteenth-century costumes attentive to the spells of a Gipsy fortune-teller, from the smoke of whose mystic cauldron rises the shadowy figure of a youthful knight in armour. A somewhat striking work is Fernand Khnopff's allegorical painting of "Solitude," a seated figure of a girl with a sword, around whom are floating unheeded bubbles of varied interests. Among portraits, which are not overmany in number, may be noted that of "Van Maerlant, Flemish Poet," lent by the Brussels Museum, a finely-painted and expressive character study by Edmond Van Hove.

The fame of Holland in oil-painting is worthily upheld by the pictures of Willem Martens and Hendrik Willen Mesdag, even if there were no others in the exhibition. By the former there are exhibited the well-known "Bride's Dream," reproductions or photographs of which are to be seen in many a shop window, both in England and on the Continent. The same artist's "Horticulturist" and "Midsummer's Night's Dream" are also exquisitely painted, highly-finished examples of Martens' skill, as are also the three portraits which he exhibits. Mesdag is represented by his picture of "The Srand at Scheveningen at Flood-tide" and "Sunset," a view of a fleet of fishing-boats at anchor, with the delicious silvery-grey tone which this painter knows so well how to impart to his lighting. An admirable example of excellent solidly-painted portraiture is Christoffle Bisschop's "Portrait of her Majesty Queen Elizabeth of Roumania"; another is the same artist's portrait of his wife. Other typical examples of modern Dutch painting are J. Hubert Vos' (of London) popular and Herkomeresque "Poor People," a dark interior, lighted only by a green glass window, with sorrowing parents grieving over the dead body of a young man laid on a bed, and such broadly and boldly-painted, dull-coloured pictures as a portrait by Marius van der Maarel, and "Children at Play," by Pierre de Josselin de Joug. Then we have highly-finished interiors like David Adolphe Constant Artz's "Sewing School at Waisenhaus," and Richard Bisschop's interiors of churches.

Denmark's contribution to the exhibition naturally enough has its strongest points in the delineation of fisher-folk and their surroundings, such as Carl Locher's "Fishermen at Sea,"—a remarkable picture of a fisherman's life; another phase of which is brought before us is Lauritz Tuxen's "After the Fishing,—Twilight,"—where our admiration of the powerful drawing is not distracted by the claims of colour, this latter being modified by the gathering dusk, the effect of which is well conveyed. Bold and powerful drawing is apparently a characteristic of modern Danish art, a further instance of which is seen in Michael Ancher's grand charcoal study of "Two Fishermen in a Boat." An excellent example of the nude is Julius Paulsen's "Adam and Eve," lent from the Royal Picture-gallery of Copenhagen. Of portraits we may note Georg Achen's portrait of his mother and of "A Painter," both of which strike us as faithful studies of character.

The pictures by Americans for the most part come from Paris, and French influence is, therefore, much in evidence. In choice of subject the ubiquity of Americans is the most prominent feature, India, Japan, and Africa supplementing the insufficiency of Europe as a sketching-ground. Clever in conception, and well worked out by the aid of skilful draughtsmanship and good colour is Fred. Arthur Bridgman's trilogy, "Virtue's Victim," a tragedy in three acts, enacted on what appears to be an Algerian house-top, the terrace of which is shown continuous through the three panels. In the first panel we see Act I., a beautiful girl reclining at ease, while the head of her assailant just peeps over the parapet; Act II., the struggle; Act III., the prostrate form of the victim, and a blood-stained dagger. The same artist also exhibits other paintings of Algerian subjects, descriptive rather than imaginative. Edwin Lord Weeks has travelled to India for his *mise en scène* and shows us some admirable paintings of "The Hour of Prayer in the Pearl Mosque at Agra," an "Open-air Restaurant at Lahore," "The Temple of Walkeshwur, Bombay," and a portrait of a "Rajah of Jodhpore," which well convey the light and colour of Eastern climes. H. Humphrey Moore is principally represented by views of Japanese life, which strike us as being somewhat "tight," in colour and lacking in atmosphere, though interesting as records of that far-off ideal home of art. Mr. Moore has at any rate kept himself free from any influence of Japanese methods of draughtsmanship or, colour. Henry Mosler has found his inspiration in quite another sphere, his "Wedding Feast" being a representation of Bavarian rural life, smoothly painted, with fine rich colour. "The Last Moments," by the same painter, is a broadly-treated Breton interior. Lucy Lee-Robbin's portrait of herself, a full-length figure in red dress with black trimmings and Tam-o'-Shanter cap, is not only a portrait but a picture, the background being furnished by the accessories of her studio, with the easel before which she is standing Other excellent examples of the work of an American are the pastels of Julius Rolshoven, studies of light, shade and tone; while the portrait of Miss S. K., with the head, viewed from the back, half turned in profile, is finely drawn and modelled. Excellent portraits are also exhibited by Charles Sprague Pearce, of "Madame P.," a three-quarter length in a pearly-grey dress of a brunette of Southern type; by Julian Story, of "My Father;" and by A. Angelo Anderson, of "Thomas Edison" with his graphophone.

Some American pictures are included in the International Room, such as "The Shepherdess" of Charles Sprague Pearce, and "The Departed on All Souls' Day," by Walter MacEwen, an old French peasant listening to the reading of his daughter or grandchild, while in the empty chair is dimly outlined the shadowy form of the departed one, a somewhat theatrical piece of sentiment, except that it illustrates a by-no-means defunct popular tradition. Here, too, we find Gari Melcher's "The Lord's Supper," which is not unknown to Englishmen as a poetical rendering of prosaic, uncompromising material. In contrast with this is Professor Carl Becker's "Charles V. and the Page," a rich and sumptuous painting of accessories, or "Otto von Kameke's "Gorner Visp," a remarkably fine study of rocks and waterfall, where one can almost hear the swirl and rush of the broken, tumbling water. In the same room is the fine historical picture by Vaclav Brozik, of the incident that precipitated the Thirty Years' War," "The Throwing of the Staathalters Martini and Slavata from the Windows of the Hradschin Palace at Prague on May 23, 1618." The struggling victims and the excited crowd of Protestant Bohemians are well portrayed, with all the variety of colour that Bohemian costume entails. Bouguereau's picture of "The Holy Women at the Sepulchre," one of the few admittedly French pictures, is also placed in this room, as well as Mesdag's picture of Scheveningen, already mentioned. A good example of Polish work in this room is Jozef v. Brandt's "Driving Horses with the Lasso," a striking picture of violent action powerfully painted.

The works of Polish painters form a very striking feature in the exhibition, both from their spirited drawing and their full rich deep colour. Anna Bilinska's portrait of the Countess A. de V. is very striking, both in the painting of the head and its flesh tones, and of the lustrous green velvet dress. The same lady's pastels and water-colours show her versatility and mastery of technique. Henryk von Siemiradzki's "Return from the Bacchanal" is an example of the delight of the Polish painters in the representation of action combined with admirable colour, which is so noticeable in their work. So also is Michal G. Wywiorski's "Tscherkess Dance," which combines, moreover, the interest of picturesque semi-savagery in costume. Siemiradzki's "Temptation of St. Jerome" is another instance of somewhat similar character, though less violent in action. Good examples of landscape are Józef Chelminski's pictures of various seasons, winter, autumn, spring, realistic but yet poetical.

The large historical picture of "Skarga's Sermon before the Landtag in the Presence of King Sigismund II.," by Jan Matejko, full of figures and rich costumes, is a very striking and admirable painting. A bas-relief in silver by Józef Hakowski, after a design by Matejko, representing "Sobieski before Vienna," is another instance of this artist's skill in the grouping of crowded figures. Perhaps the most remarkable of the Polish pictures is "The Young Artist's Dream of the Future," by Jacek Malczewski, a large painting of a youth whose prosaic occupation as errand boy is neglected while he lingers under the shade of a tree speculating on the future that art may have in store for him.

Turning now to the work of German painters, and taking, first, those of Berlin, we find that, as we have here the largest number of paintings from any one centre, so naturally we find the proportion of mediocrities to be also the greatest. The impression one derives from looking through the works of the Berlin painters is that *genre* is pre-eminent. There is no elevation in the choice of subject, no intellectual character in the *motif*. Mastery of draughtsmanship and the technique of painting there is undoubtedly, but the sense of fine colour does not appear to be largely prevalent. The paintings of Luise Begas-Parmentier, drawn from Venetian sources, are an exception. Here we have good, pleasant colour, full of light, free from the trickery and slap-dash of the Italian painters. The same artist also sends some water-colour drawings of Venice, which well convey the effect of atmosphere by the use of what is sometimes called legitimate or transparent water-colour methods. The paintings of mountain scenery from Norway, by Themistokles von Eckenbrecher, are good, pleasing, and expressive. When the German painter, or at least the Berliner, does succeed, it is usually in landscape. In landscape-portraiture, that is, as a general rule, rather than landscape-poetry, such, for example, as Hans Hartmann's "Sicilian Ships in the Harbour of Savona," a view of a brig, stern-on, alongside a quay wall, with masts of other vessels lying by. Hermann Prell's quasi-imaginative picture of "Rest during the Flight" (into Egypt) rather borders on the ludicrous, when we see Mary and Joseph, during their rest, enlivened by a very matter-of-fact angel playing a fiddle. Such an idea needs the greatest skill to raise it from the level of a farce to that of poetry, or an unconscious naïveté, such as we find in

Mediæval painting; here both the skill and the naïveté are lacking. Adolf Hering has an example in "Found" of a striking and pathethic if somewhat ghastly subject, a mother finding the body of her daughter on the table of a dissecting-room. The pathos is real enough, but the details of the locale are over-prominent, and lead to the ghastliness of the picture. Berthold's Genzmer's "Careless Days" is a pleasing and well-designed picture of children making mud-pies, with a background of farm and hedgerow, that, though not ambitious, is the sort of picture one might live with in comfort. Friedrich Heyser's "Peri at the Gate of Paradise," although the gate is an eighteenth-century wrought-iron one, is nevertheless admirable, both in drawing, colour, and composition.

Turning to the Munich pictures we note especially the harmony of tone and the sense of values pervading the work of the painters. Some portraits by Kaulbach are amongst the best examples of this class of work in the exhibition. Quasi-religious subjects are frequently adopted by the Munich painters, such as "The Vision of Mary," by George V. Hoesslin, where the Virgin Mother is sitting wrapt in fear and amazement at the shadowy crown of thorns hovering over the head of her sleeping child. A striking picture is Bruno Pilghein's "Blind," a large painting of a Syrian girl in a blue dress, carrying a water-jar through a field blazing with red poppies. Very charming are the studies of Bavarian peasant-life by Friedrich Proelss, "Return from the Shooting-match" and "Village Beauties," well modelled, sober, and yet rich in colouring. A remarkable nocturne in blue is Franz Stuck's "Lucifer," a seated figure finely drawn, with some exaggeration in the treatment of the flashing eyes.

The Düsseldorff paintings are strong in landscape, with the open-air effect well expressed, such as Olof Jernberg's "Dünenhof—a Dutch landscape,"—and Carl Mücke's "Dutch Genre." In Adolf Schweitzer's "The Regen in Naerothal, Norway," the texture of the different features of mountain landscape is well caught. Hans Wislicenus gives us another good example of aërial effect in his "Incident in the travelling of 200 years ago:" a travelling-carriage struggling uphill along a miry road in damp, driving mist.

The painters of Karlsruhe appear to delight in low grey tones of colour, as in Adolf von Meckel's pictures of Arab life, which show a deliberate preference for such colouring when so many other schemes might readily have been adopted with such a hunting-ground. So with Friedrich Kellmorgen's "Playing Children," a Dutch scene, and Gustav Schönleber's "Riviera di Levante." Widely apart as are the localities from which these painters have drawn their inspirations, there is throughout the same general characteristic colour-scheme.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fifteenth general (business) meeting of this Institute for the present session was held on Monday last, at 9, Conduit-street, Mr. Alfred Waterhouse, R.A. (President), in the chair.

Obituary.

The decease of Mr. Edward J. Tarver, F.S.A., Fellow, and of Sir John Hawkshaw, F.R.S., Hon. Associate, was announced; and, after some remarks in reference to Mr. Tarver, by Mr. John Hebb, Fellow, Professor Aitchison A.R.A., Vice-President, and the President, it was resolved, that a letter of condolence be addressed to Mrs. Tarver in the name of the Institute.

Election of the Council.

The President having opened the report of the scrutineers (Messrs. William Kidner, Zeph. King, H. D. Searles-Wood, Fellows; and H. Hardwicke Langston, Edmund Woodthorpe, William A. Pite, Associates) appointed to direct the election of the Council for the official year 1891-92, it was found that 496 voting-papers had been received, and that of these the scrutineers had rejected 23. The announcement of the election was then made by the President as follows:—

President.—John Macvicar Anderson.

Vice-Presidents.—Professor George Aitchison, A.R.A., Arthur Cates, Henry Currey, and Campbell Douglas (Glasgow).

Hon. Secretary.—Aston Webb.

Members of Council (18).—The following candidates are elected: Thomas Edward Collcutt, 428; Ernest George, 406; John Slater, B.A. Lond., 391; Thomas Blashill, 389; John Belcher, 387; James Brooks, 382; Wyatt Papworth, 373; William Emerson, 370; Alexander Graham, F.S.A., 365, and R. Phené Spiers, F.S.A., 365; John McKean Brydon, 356; R. Herbert Carpenter, F.S.A., 325; John Holden (Manchester), 315; Leonard Stokes, 298; Octavius Hansard, 295; John Alfred Gotch, F.S.A. (Kettering), 290; Edward Augustus Gruning, 289; and Lacy William Ridge, 259.

Associate-Members of Council (2).—The following candidates were elected: Thomas Miller Rickman, F.S.A., 373; Paul Waterhouse, M.A. Oxon., 358.

Presidents of Allied Societies (8).—Henry Crisp (Bristol Society of Architects); Thomas Drew, R.H.A. (Royal Institute of the Architects of Ireland); Richard Knill Freeman (Manchester Society of Architects); Stockdale Harrison (Leicester and Leicestershire Society of Architects); William Leiper (Glasgow Institute of Architects); Thomas Mellard Reade, F.G.S. (Liverpool Architectural Society); William Henry Thorp (Leeds and Yorkshire Architectural Society); and Herbert Walker (Nottingham Architectural Society).

Representative of the Architectural Association.—Frank Thomas Baggallay, President, A.A.

Election of Auditors.

Fellow.—Joseph Stanislaus Hansom.

Associate.—Reginald Alwyn Crowley.

The results of the election of the Standing Committees and of new Fellows and Associates we are obliged to postpone until next week, as the business meeting was not open to our reporters, and we only obtained the information late on Thursday morning.

The New Educational Scheme of the Architectural Association.

At the close of the business, the meeting was open to visitors, and was continued for the following purpose, viz.:—"To receive and consider the new educational scheme and curriculum of the Architectural Association, which will be submitted by the President of the Association, who will ask the Institute for its approval and support of the same."

Mr. F. T. Baggallay (President of the Architectural Association), said that he proposed, as far as time would permit, to lay the scheme before the members of the Institute, asking them for a generous support to this effort of the students to obtain a more systematic and better training than was open at present to the majority of them. The system of examinations established by the Institute showed that that body was anxious to ensure that its members should be well instructed. The establishment of these examinations had been the most important feature in bringing home to the students the necessity which existed for some systematic course of instruction and training in their profession, and that fact laid some sort of responsibility upon the Institute, to assist the students in establishing such a course. At the same time, the members of the Architectural Association did not desire to base their appeal upon any such suggestion, but rather upon the readiness which the Institute had at all times expressed to help them. The President of the Institute, in his opening address in 1889, referred to the advisability of the senior society helping the juniors, and, in a letter addressed soon afterwards by the secretary of the Institute to the secretary of the Association, reference was made to the wish of the Institute to aid in the good work. He would, first, refer to the new educational scheme. Since pupilage would not satisfy all the desires of the students, it was necessary to say something on the subject. There had been no blow aimed at the pupilage system. He did not mean to say that there were no members of the Association who would not be frankly pleased to see the system superseded; but that was not the feeling of the framers of the scheme, who desired to see the system retained. There was, of course, much scientific and technical knowledge which could not be acquired in an ordinary office; some few students had gained this at the universities, before entering an office, while the remainder had to acquire it out of office hours. In many offices, again, the pupils learned little, unless the organisation was strict, they got little attention, being set to do work which was not always interesting or improving. There were also some offices where the work was of a special kind, which might or might not be useful to the student in after-life; for few parents considered, before articling their son, where his future practice would come from, and still fewer could foresee it. There were, further, the small offices, where the pupil did everything, and learned a great deal in doing it, and sometimes some things which he ought not to have learnt. It seemed, therefore, to be acknowledged that pupilage required supplementing, and this was shown by the increasing numbers of the Association and other institutions of the kind. If pupilage was all-sufficient, whence did these institutions derive their support? In fact, the Institute had acknowledged the want of supplementary training in the articles of pupilage suggested a short time back. It had been said that they did not recognise some of the institutions which had been newly established, and that they were proposing to duplicate unnecessarily the facilities afforded by these institutions. But even if they did duplicate those facilities, they could not allow that it would be altogether unnecessary, because they held that their chief need was a complete system of training, which must be taken up as a whole, and at a moderate cost. As a matter of fact, the existing facilities did not meet the needs. That they were facilities to be coveted was true, but, unfortunately, they were only accessible to the few. As to the Academy schools, who could wish for anything better than to study design there? But it must be remembered that the architectural school of the Academy was only open for six hours in the week. The number of the students was limited; it required some years of training before a student was admitted; it was quite useless to students in the early stages of their career; and, finally, the limit of age on admission was singularly low. This last condition made the school of little use to the large and increasing class of students who left school late, and who were easily beaten in the competitions by men who had spent more time at the drawing-board. There was one argument against leaving any important subject out of the new course, which he hoped would appeal to the members of the Institute,—what the students were looking for was a complete course of preparation for the examinations, and the chance of attracting them would be jeopardised if, in studying certain subjects, they were told to go to other institutions. As to the Association, it was essentially a society of architects' pupils and assistants,—of students, in fact,—its main purpose being self-improvement, and the affording of facilities for the study of architecture. The Association had existed more or less in its present form for forty-four years, and a considerable proportion of the members of the profession had passed through it, some of whom were now in the foremost rank, many having continued their membership up to the present time. A small proportion of those now on the Committee of the Association were architects in practice, but the students were in such a majority as to completely control its affairs. As long as he could remember, the students in the classes had had cause to complain of the practical working of the old system. When architects who aspired to membership of the Intitute were not subject to examination, the few discontented ones could be satisfied with partial reforms; but, since the establishment of the examinations, an ambition to pass them had seized most of the students, the grumblings had become more and more pronounced, and the question of a drastic reorganisation of the educational system had come to the front. In fact, the chief promoter of the agitation was elected on the Committee of the Association at the first opportunity, though he was young and comparatively unknown previously. The opposition to the scheme had not come from the junior members, but rather from those who had no practical knowledge of the present needs of the student members. The opposition came almost entirely from those who might be called the retired members, and was chiefly based on the proposal to raise the annual subscription, which was part of the original scheme. In their objection to this detail, it was not surprising that those gentlemen received the support of some of the poorer students; but when it was abandoned in favour of an increase in the fees of future members, the opposition died out. The Association having for its main object self-improvement, the study was conducted at first on the mutual system, and one of the complaints was that they had heedlessly thrown aside this vital element. Mr. Phené Spiers had said that





ATHLETE STRUGGLING WITH A PYTHON." Sir F. Leighton, P.R.A., Sculptor.

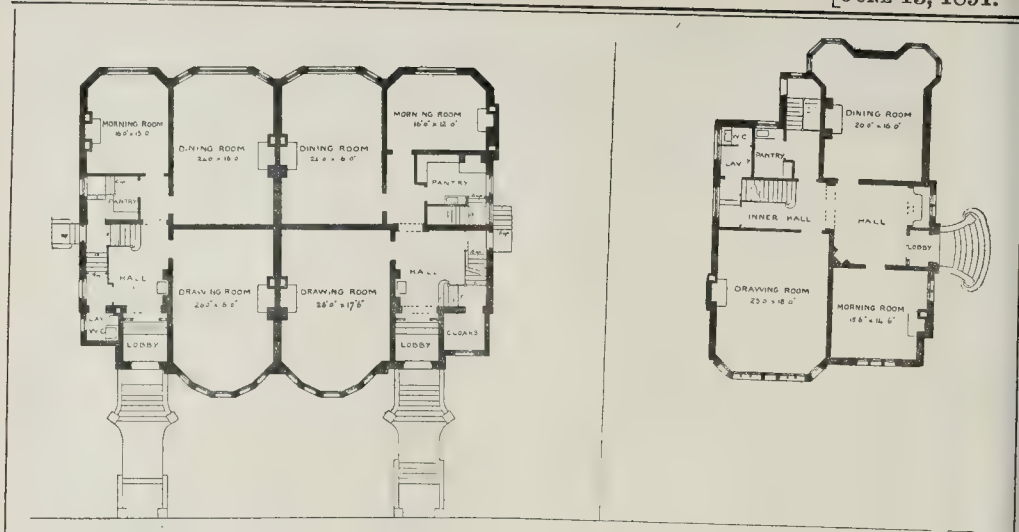
No. 929, Royal Academy Exhibition, 1881.

in a letter to the *Builder* of the preceding Friday. Now, mutual self-instruction was all very well from the sentimental point of view, but only in the case of advanced students, and it did not commend itself on practical grounds to those who remembered the result of the blind leading the blind. It had survived in its integrity in only one class, and partially in another, and in the new scheme as much was retained as now existed. He could vouch that seventeen years ago there was nothing like mutual self-instruction in the elementary class of design, that class being then conducted by so-called visitors, without any discussion or criticism from the members. This system of visitors or voluntary teachers had been for many years the main teaching system of the Association, but for a long time it had been supplemented by a system of paid or partially-paid teachers and lecturers. They had now one senior class, conducted on the mutual system, which it was not proposed that the new scheme should touch. There were seven classes conducted by visitors, in one of which the teaching was supplemented by mutual criticism, and six classes conducted by teachers, who received a small honorarium, besides the class for water-colour drawing. There was a great lack of system in all this, the classes being absolutely independent of one another. The classes had grown up, one after another, in the course of years, and although many efforts had been made in the direction of organisation, each class remained a little republic in itself. Of the voluntary visitors a number were unable to attend regularly, and the whole arrangements of the classes were upset. The effect on the junior students of subdividing the teaching had been lamentable, as they got bits of information which might or might not be formed some time into one broad sheet. There was also the irregularity in the students' attendances at the classes, which diminished, from the first to the last meetings, as much as 80 per cent. This was, undoubtedly, due to the discontent arising from the defects pointed out, but also partly to the small fees paid, ranging in the voluntary classes from 1s. to 2s. 6d. for the year. In the case of the lectures where higher fees were paid, there was nothing like the same falling-off. The multiplication of small difficulties and inconveniences showed that the old system was inadequate, and that the teaching machinery had become so complicated that it would no longer work. In the seventeen years of his experience, the members of the Association had increased from 559 to nearly 1,200, and the number of classes had risen from four to fourteen, including the lectures, and there seemed no possibility of permanent improvement unless they saw their way to abandon the voluntary system. Students, owing to the examinations, were demanding a more precise and complete training than the Association had ever pretended to give. Turning to the proposals for the future, he would acknowledge at once that the scheme was a bold one, but he would ask his hearers to believe that the boldness was not mere boyish rashness. It was proposed, because, having carefully discussed the various courses it was possible to adopt, they had come to the deliberate conclusion that a bold policy was the most likely one to succeed. Much that he had said bore on this point. For instance, what was wanted was not so much additional facilities, or even better teaching, as a complete course, method and system, instead of scattered and fragmentary classes, the essentials of success being completeness and method. Students desirous of a course leading up to the Institute examinations, would, he believed, readily pay ten guineas a year for such, and the Association would like them to study some subjects which are not included in the Institute list. Whether it would be desirable to at once appoint teachers for all these extra subjects would be open to question, but it seemed necessary to establish classes or lectures for all the subjects indicated in the examinations. It would be also necessary to substitute paid for voluntary teachers, if they were to have any regularity and method. In doing so they wished to get experienced teachers, so that they might look for more consistency and continuity. Most of the important details of the scheme were based upon evidence gathered from several gentleman well-known in the profession. One of the points considered, after it had been decided what subjects should be included in the course, was, how much time the students would have at their disposal to attend the classes. It was assumed that, even if day classes were held, there must be a repetition in the evening, and, as a matter of fact, it was not proposed to hold any day-classes during the first year. It appeared upon the evidence, that the students might be expected to give twelve hours a week of their evening time, but, in order to be well within the mark, they proposed a smaller number of hours. They also wished it to be distinctly understood that each year's work could be spread over two years. As to the duration of the complete course, it had been considered desirable so to arrange the subjects, that the student might take the course in preparation for the Intermediate examination in the two years after passing the Preliminary Examination before he might sit for the Intermediate; and again, he might take the course for the final examination in the final two years after passing the intermediate. That spread the course over four years, but it was hoped that it might be extended by most students over a longer period. The proposed course was divided into two parts, a course of lectures and a studio. The subjects of each course were set forth in two columns in the paper distributed to the meeting. In the classes it was proposed to teach theories, and in the studio these would be applied to the designs made, the students being encouraged to consider design and construction in their true relation to one another. Each evening spent by the student on the theoretical side would be divided between two lectures or classes, occupying an hour and a half each, and each subject would be treated on its own merits. One evening a week spent in this way would suffice to impart the theoretical construction required in the first two years' course, leaving two evenings a week for the studio, which would be open for two evenings a week for first and second years' students, and two evenings weekly for third and fourth years' students. Evenings would be set apart occasionally for comparing and criticising the work, and it was hoped that the members of the Institute would help by acting as visitors. In the daytime the studio would be open for the use of those students who, being allowed the time, might be able to continue their studies by themselves; but no master would be present in the daytime. As to the few extra subjects, the proposition to establish a course of painting and sculpture had been exaggerated into an idea to teach those arts. The only intention, however, was to give a few lectures on other arts, pointing out their connexion with architecture, and endeavouring to give the students an intelligent interest in those arts, which, at present, were too much dissociated from their own. It might not be found advisable to include all those extra subjects, during the first year, but it was desired to do so as soon as possible. One thing they were particularly anxious to do, viz., to found at once a course which should be complete in itself, and for which an inclusive fee could be charged. If separate fees for each course were charged, experience taught that some of the unimportant, but, at the same time, unattractive ones were neglected; nevertheless, on payment on a higher scale, any single course would be open to any student. As to the financial aspect of the question, the proposal was to charge an inclusive fee of ten guineas for the complete course, or five guineas for either division, and for separate classes fees calculated at the rate of 2s. 6d. per meeting would be charged. Taking the number of students, who joined the classes of the Association, it was not too much to expect that those who would take up the course would be equal to twenty-five paying the whole fee of ten guineas. The income from this source, if the calculation was correct, would, therefore, be 1,000*l.* per annum. The fees required to pay the masters of the studio, they reckoned would be from 150*l.* to 200*l.*, and the fees for the lecturers and instructors on the theoretical side, calculated at an average of a guinea-and-a-half for each lecture, would amount to 504*l.* He might add that it was not proposed to pay the instructors the full fees, independently of the number of students who attended, but they would have to be guaranteed a certain proportion, and the remainder would be made dependent on the number instructed. The rent of more extensive premises would dispose of part of the surplus, and they were negotiating for premises in the neighbourhood, which would accommodate the studio and class-rooms, and serve their purpose, if the Institute allowed them to continue holding their usual meetings in that room. After paying the extra rent of those premises, cleaning, lighting, and so on, a fair margin would remain for contingencies. If, therefore, the scheme could be set on foot, they had the greatest confidence that it would be self-supporting. Success, of course, depended on the number of students willing to pay the fees, and he thought he had said something to show that they were not very rash in their expectations on that point. He had been told that this experiment had been tried before and had failed, but, even if that were so, circumstances altered cases, and the establishment of the examinations had, undoubtedly, created a demand, which never previously existed, for some such course of study. The initial expenditure would be considerable, for they feared that for the first two or three years their financial expectations might not be realised, and, though there were sound reasons for anticipating ultimate success, they must at the same time, guarantee against the possibility of ruining their prospects by being cramped for money. The Association had no capital to fall back upon in case of a loss. They ought to have some capital in hand before launching the scheme, and one of his objects was to ask the Institute to give them a donation, which would be valuable, not only for the money itself, but because, if the Institute headed the subscription-list, their appeals would then have a weight which would ensure success. The Council of the Institute, he believed, had passed a generous resolution, and had given a somewhat cautiously-worded approval. The Council must, of course, be cautious, but he asked the members, as a body, to give these propositions a more hearty approval, showing that the Institute meant what it said, by authorising the Council to give a generous subscription. They appealed, furthermore, to individual members to help, not only with their purses, but also by encouraging their pupils to attend the classes.

Mr. Leonard Stokes, past President of the Association, supported the scheme, and appealed for the sympathy of the members as a body, and individually, by giving guineas in one sense, and brains in another. They recognised the importance of the scheme, which had taken two years to hammer out, and, although it might be somewhat vague, and open to a few objections, yet, on the whole, it was not a bad scheme. He hoped, therefore, that the members of the Institute would criticise it, as the Committee of the Association would be only too pleased to receive any suggestions. The 1,200 students of the Association desired to advance themselves and their profession in every way they could, and that was the main reason of their moving now to supply themselves with a more systematic course of training than at present existed in their own body. Mr. Baggallay had made no definite proposition, but had merely asked the members of the Institute for an endorsement of the principles laid down. They had done everything they could to secure the assistance of a good many private individuals. Mr. Waterhouse had helped them most generously, and wherever they had gone they had so far not received any refusals of help; so that he hoped the Institute would not set any bad example by refusing their support.

Professor Banister Fletcher said he could not sit still and hear it said that the curriculum now proposed was the first of its kind in the field, and that it had not been taught in any college. The curriculum at King's College, which was established more than a year ago, had been prepared after intense labour, and contained, he believed, everything that had been brought before them that evening. At King's College, not only was the architectural course divided into three years terms, but during those three years every part of the subject had been taken up, while at the present there was a studio open. The museum now contained 776 architectural drawings, 118 casts, 204 building construction diagrams, 87 models, and 662 specimens and examples. He thought it only right, therefore, to show that, whatever the scheme might be, it could not claim to be the first in the field.* At

* If Professor Banister Fletcher suggests that the existing curriculum for architectural students at King's College (no doubt largely due to his initiative) was prior in date, as to its inception, to that framed by the Architectural Association, we would point out that the latter appeared in *A.A. Notes* for May, 1890,—the same number which chronicled Professor Banister Fletcher's appointment to the chair vacated by Professor Kerr.



Plans of Houses, Frognal-gardens.

King's College they had 125 students, the whole course costing only seven guineas for the academic year, and he failed to see where the contention as to the excessive fees came in. With regard to the proposition itself, it was a pity that the Architectural Association should run down the articled pupilage system, and allege incompetency on the part of the masters. He was about to establish day classes for architecture at King's College, having appointed one demonstrator, and having made arrangements for another.

Mr. John Slater suggested that, as the hour was late, the discussion of so important a subject should be adjourned.

Mr. R. Phené Spiers said he thought it would be very desirable that they should have Mr. Baggalay's paper in type and before them previous to the adjourned discussion, if it was to be adjourned. Mr. Baggalay had worked at the question all through, and he (the speaker) was free to confess that the paper had put the scheme in a different light from that in which he saw it before.

The President said that the subject had been discussed at the Council that afternoon, and the following resolution agreed to:—"That it would be desirable that an annual donation, during pleasure, be given towards scholarships or otherwise, in connection with the Educational Scheme of the Architectural Association." The old Council did not feel justified in pledging the new Council to any definite course of action, but they had thought that at any rate they might express their sense of the desirability of such assistance being afforded.

Mr. Slater then formally moved the adjournment of the discussion.

Professor T. Roger Smith seconded the motion for adjournment, and thought it would be desirable if Mr. Baggallay's paper were printed in the proceedings.

Mr. W. H. White (Secretary) said that the paper had been ordered to be printed in full.

The President then announced the adjournment of the discussion to Monday, July 6, and stated that the next meeting would take place on the 22nd inst., when the Royal Gold Medal would be presented to Sir A. Blomfield, A.R.A., and a paper will be read by Mr. Tavenor Perry on "Mediæval Architecture in Sweden."

The proceedings then terminated.

THE TIVOLI, STRAND.—By direction of the Court of Chancery, this building in the Strand, nearly all freehold, and comprising a large theatre of varieties, restaurant, buffet, &c., was recently offered by auction by Mr. William J. Hamnett, at the Mart, when, after keen competition, the biddings went up to 100,000*l.*, but that not reaching the reserve fixed by the Court, the estate was bought in. Private negotiations at once ensued, with the result that the property has been bought by a group of persons interested in this class of business.

Illustrations.

"THE ATHLETE;" SCULPTURE.

THIS is a phototype reproduction of the marble edition of this now celebrated work by Sir F. Leighton, which is at present in the "Lecture Room" of the Royal Academy.

The phototype is reproduced from a photograph by Mr. Edwards.

EXETER CATHEDRAL.

WE give this week, as promised, another view of Exeter Cathedral taken from the south-east, from a sketch which has been generously presented to our readers by Mr. Needham Wilson, over and above his special engagement to make a drawing for our Cathedral Series.

HOUSES, FROGNAL-GARDENS, HAMPSTEAD.

THESE houses have been built at the southern entrance to the Frognal Mansion Estate, on the new road called Frognal-gardens, from the designs of Mr. James Neale, F.S.A., the architect to the estate. The walls, all of substantial thickness, are faced with Lawrence's and Leicester pressed bricks, with cornices and dressings of Monk's park stone; the roofs of the detached house being covered with bright red tiles, and of the semi-detached houses with Broseley tiles.

Since the perspective was made, it has been found desirable to modify the detached house by carrying the bay-window of the drawing-room up to the second floor, and by substituting a bay-window on the south side of the dining-room for the two angle-windows shown on the plan.

The detached house, and the larger of the two semi-detached houses, have each a full-sized billiard-room on their half-basement stories, besides kitchens, sculleries, pantries, larders, servants'-rooms, store-rooms, &c. Each house contains nine or ten bedrooms and dressing-rooms, the largest measuring 22 ft. by 17 ft. 6 in.; the plans published herewith show the accommodation on the ground stories.

Particular attention has been given to the drainage and ventilation.

The whole of the works have been very satisfactorily carried out by Messrs. Allison & Foskett, of Holly-hill, Hampstead, under the personal superintendence of the architect.

The perspective view illustrated by us to-day is now being exhibited at the Royal Academy.

CLARIDGE'S HOTEL, BROOK-STREET, W.

THE plan for rebuilding and extending these premises is capable of erection in three separate divisions, and in such a manner that the first and second divisions can be put up without seriously interfering with the existing buildings, while the third division would finally occupy the place of the present Brook-street frontage.

The main feature of the plan is the adoption of a central court-yard, treated in a picturesque manner. The materials to be employed for the elevations are red bricks and stone. The roofs to be tiled.

The accommodation will be as follows, exclusive of that for the servants:—

	Ground Floor.	First Floor.	Second Floor.	Third Floor.	Totals.
Sitting-rooms ...	14	10	13	nil	37
Bed-rooms	10	12	16	30	63
Bath and dressing-rooms.....	5	7	10	12	34
Bath-rooms.....	2	2	2	3	9
W.c.'s	9	7	7	14	37
Special suites ...	3	8	10	nil	21

In addition, there are on ground and first floors:—Table-d'hôte room, billiard and smoking-room, ladies' boudoir, drawing-rooms, waiting-rooms, office, still-room, &c., &c.

The architect is Mr. W. D. Caröe, and the drawing from which the illustration is taken is hung in the Architectural Room at the Royal Academy.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday afternoon at Spring-gardens, the Chairman, Sir John Lubbock, presiding.

Withdrawals of Tenders.—The report of the General Purposes Committee contained the following paragraph and recommendation:—

"Our attention has been directed to the prevalence of the practice on the part of persons tendering for works under the Council of withdrawing their tenders either before or after acceptance when they have ascertained that their tenders are the lowest, and that in the ordinary course they would be called upon to sign a contract and to carry out the works. As regards accepted tenders there is a standing order to the effect that the Council will not accept the tender of any person or firm who shall on any previous occasion have withdrawn a tender after the same has been accepted by the Council, unless the reasons for the withdrawal were satisfactory to the Council. This does not seem sufficient to deter persons from withdrawing tenders after acceptance, and previously to acceptance there is nothing to prevent a person from withdrawing a tender to which on further consideration he prefers not to bind himself. The withdrawal of tenders, either before or after acceptance, always leads to delay and inconvenience, and most of the committees concerned with tenders complain of the extent to which the practice prevails. We have given a good deal of attention to the subject, and have asked the committees interested to offer suggestions as to the best method of obviating the inconvenience complained of. A suggestion which found favour with many of them was that all tenders should be opened by the committees, instead of in public at the Council. There is no doubt much to be said



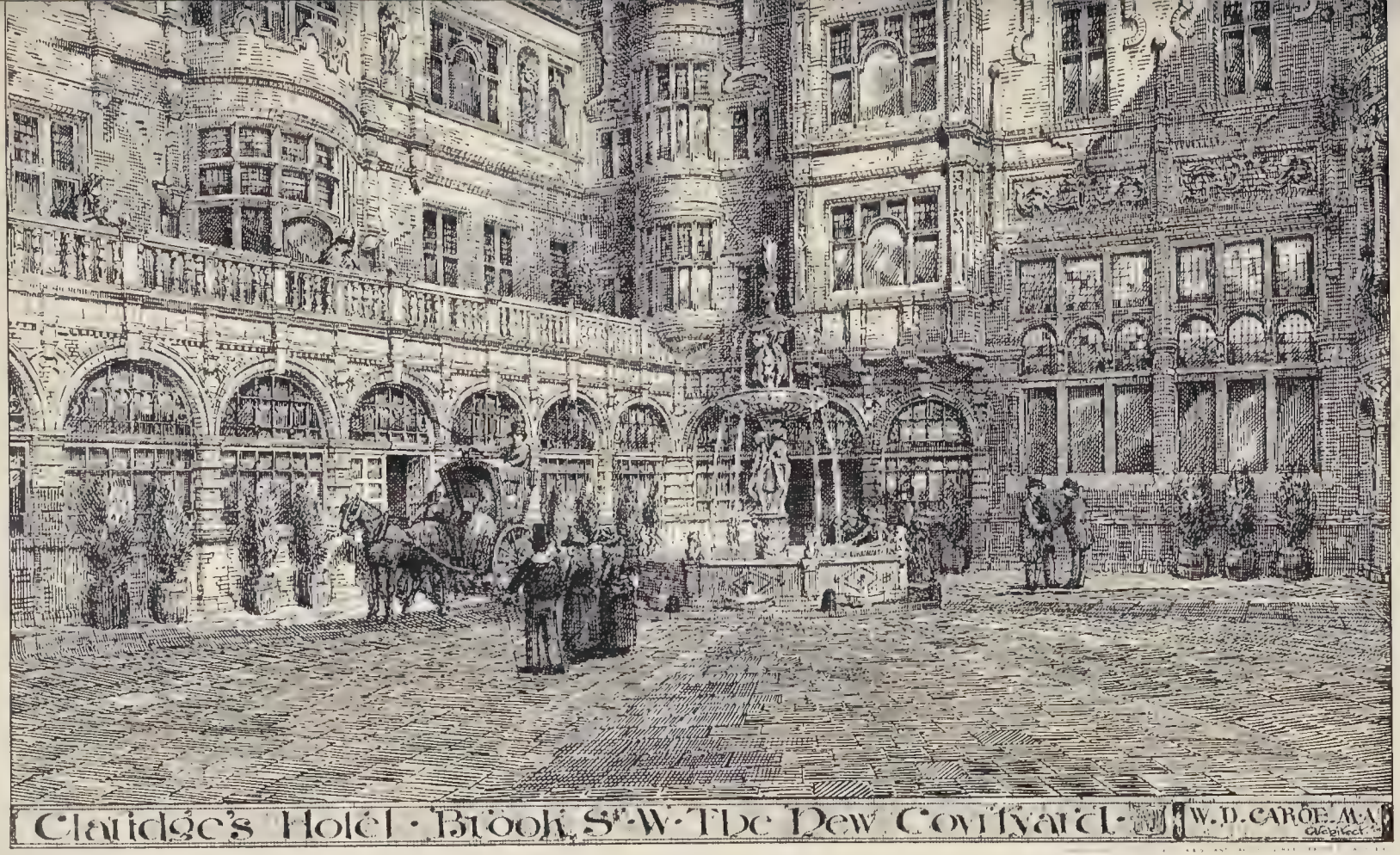
NEW HOUSES AT FROGNAL GARDENS,

No. 1845, Royal Academy Exhibition, 1891

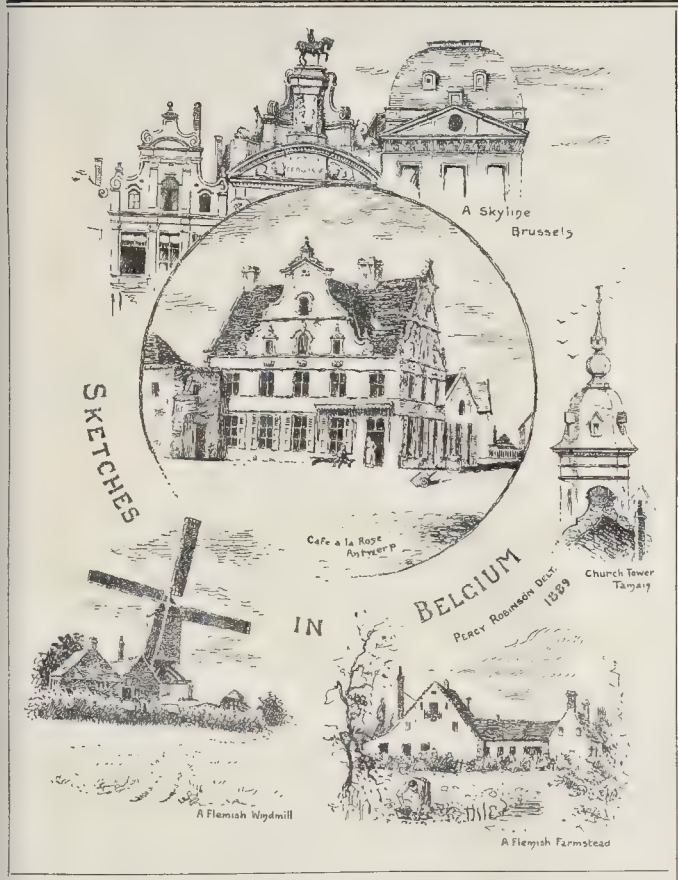


TEAD.—Mr. James Neale, F.S.A., Architect.





No. 1787, Royal Academy Exhibition 1891



in favour of this course, which we find is followed by many of the large municipal bodies. On the other hand, the practice in London having been for the most part to open tenders in public, dissatisfaction might be caused if the practice in this respect were altogether altered. Another suggestion made by two of the committees was that persons tendering should be required to deposit with their tenders a sum of money having some relation to the value of the work to be carried out. If a person afterwards withdrew his tender, his money deposit would be forfeited; in other cases, the money would be returned to the respective tenderers. We think that, on the whole, this will be the best arrangement, and that if, adopted by the Council, it will probably induce persons to be more careful in preparing their tenders. We recommend—

"That the following be a standing order of the Council:—'Every person tendering for the execution of works or the supply of goods required by the Council shall send, under cover with his tender, a sum of money in a bank-note or notes, such sum of money to be forfeited by any person who may withdraw his tender after it has been opened by the Council or the committee concerned; the money in other cases to be returned to the respective tenderers. The amount to be so deposited shall be fixed either by the Council or by the committee inviting the tenders.'"

After some discussion, in the course of which it was urged that the proposed Standing Order would add too greatly to the already onerous conditions of tendering, an amendment referring the matter back for further consideration was adopted.

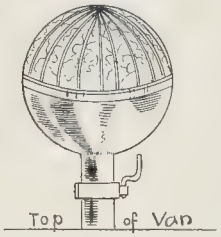
After discussing at some length a project for purchasing certain of the London tramways, which was defeated, and transacting other business, the Council adjourned.

WESLEYAN CHAPEL, NEAR DONCASTER.—On the 4th inst., memorial stones were laid in connexion with a new Wesleyan Chapel at Bentley, which is to be erected at a cost of 1,800*l*. The site has been given by Mr. W. Chadwick, and the scheme includes chapel and schools. The architect is Mr. C. J. Innocent, of Sheffield, and the contractors Messrs. Sprakes & Son.

THE BEXLEY SYSTEM OF EMPTYING CESSPOOLS.

IN small towns or villages in rural districts, where facilities for sewage disposal do not exist, as well as in connexion with isolated mansions or cottages, cesspools appear to be inevitable, if we except the alternative of dry-earth closets. Sanitarians are divided in opinion as to the merits of the two systems. While both systems have certain disadvantages, they have at the same time certain advantages, provided that they are constructed and used under proper conditions. To confine our remarks in this brief article to cesspools, it is self-evident that where those receptacles of filth cannot be dispensed with, they should be properly constructed and rendered impervious; and they should also be placed as far as possible from any dwelling. If we mistake not, the Model By-laws of the Local Government Board stipulate that no cesspool shall be placed within fifty yards of any dwelling,—a very useful stipulation if it be strictly observed. But, assuming that a cesspool be properly constructed and located, something more has long been wanted, viz., a method of emptying it by day or by night without causing intolerable nuisance to the whole neighbourhood during the operation. Such a method has been devised and brought into operation at Bexley and Bexley Heath by Mr. E. Reeve Boulter, the Surveyor to the Bexley Local Board, and we had an opportunity of witnessing it in operation at Bexley Heath on Monday afternoon. Mr. Boulter, of course, does not claim that the whole details of the method adopted by him are novel, but he does claim, and apparently with justice, to have introduced certain improvements on pre-existing methods. He has, however, sought no protective patent-rights, but places the results of his practical experience at the disposal of all surveyors and sanitary inspectors and Health Authorities.

The plant used at Bexley consists of two iron tank vans, each holding about 400 gallons; two of Waller's cesspool pumps; 280 ft. of leather hose, to connect the vans with the pumps; two lengths of suction-pipe, to connect the pumps with the cesspools; and one hose-reel. So far, there is nothing novel, except in points of detail. The vans are made by Messrs. E. & H. Hora, of Camberwell. Each is provided on the top with a screw-down air-tight manhole (only opened for the periodical cleansing of the van); with a flat ∩-shaped pipe-connexion for the attachment of the hose; with a simple automatic cork float indicator to show when the van is nearly full; and with an air-cock of special construction to allow of the innocuous escape of air from the interior of the van as it becomes displaced and driven out by the matter pumped into the van. The accompanying sketch will explain the nature of this air-cock. It consists of a short length of metal tubing



with a cock surmounted by a metal basin, 5 in. or 6 in. in diameter; this basin or cup is in its turn surmounted by a hinged wire-barred cap or cage. The basin or cup, and, indeed, the whole of the space within the cage, is filled with wood-shavings and chips saturated with "Sanitas" fluid, and kept moistened as often as may be necessary. When the van is about to be pumped into, this air-cock is opened, allowing the air expelled to pass through without the least offence to the nearest passer-by or to the people in the nearest house with open windows. The hose may, if necessary, be brought through a passage or room without causing any nuisance. The *modus operandi* is to open the cesspool, pour in a sufficient quantity of deodorising fluid, consisting of manganate of soda (a green powder) diluted with water, and then to stir the whole contents with a pole so that they become thoroughly mixed; such is the power of the deodorant that this operation is rendered inoffensive to the sense of smell. The suction-pipe is then inserted, and the contents of the cesspool pumped into the tank-van. Should one van become full before the cesspool is empty, of which fact the float gives indication, the order is given to cease pumping for a moment, and the end of the hose-pipe is disconnected from one van and connected to the other, an ingenious metal diaphragm arrangement coming into play to retain the contents of the hose-pipe, even though the latter be placed in a recumbent position. The vans when full are taken on to agricultural or market-garden land, and the contents discharged into plough furrows as the van travels along. The arrangements for discharging the contents consist of a short length of hose depending from an opening 7 in. in diameter in the bottom of the van and towards the rear. This opening is stopped by a conical ground-in plug, raised or lowered by a rod and screw from the top of the van. To facilitate the complete emptying of the van there is an arrangement for slightly tipping it.

Altogether, the arrangements made by Mr. Boulter for performing a very disagreeable operation, with the minimum of offence of any kind, are well worth the attention of Rural Sanitary Authorities and their officers. At Bexley the work is carried out by the Local Board staff, under the direction of the Surveyor, at a moderate scale of charges, £1. 1s. being charged for emptying a cesspool containing not more than 1,200 gallons, graduated up to £2. 5s. for a cesspool of 3,000 gallons capacity. We understand that this undertaking of the work by the Local Board, which affords some guarantee for effectual performance, has completely superseded the work of the former nightmen. Since August 1, 1890, when the system came into operation, nearly 300 cesspools have been emptied by the Board's staff. We believe that already the Bexley system has been partially adopted at Gravesend. We conclude by appending an extract from the annual

report of the Medical Officer of Health of the Bexley Local Board, dated February 2 last:—

"Before concluding my report, I must express my satisfaction at the adoption by the Board of the plan of emptying cesspools as developed and carried out by your Surveyor. The inodorous, cleanly, and altogether inoffensive method above mentioned is a great contrast to the usual plan of night removal. The work being carried out *during the day* by the Board's own workmen ensures that it is done in a far more satisfactory manner than by the old method. I most heartily recommend the system to all sanitary authorities whose districts are not sufficiently developed to bear the expense of sewerage works."

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—From the annual report of the Liverpool Architectural Society it appears that there are now 120 members, against 126 in the previous year. There are forty-seven fellows, thirty-five associates, twenty students, and eighteen hon. members. During the session thirteen meetings were held. A visit had been paid to Ripon and Fountains Abbey, but as the members did not seem to appreciate these excursions it is feared that they will have to be discontinued. With regard to the students, the Council had not decided upon the best means of holding evening classes to prepare them for the Institute examinations, but they are negotiating with the authorities of University College, and they hope to come to a satisfactory arrangement. The total receipts, including the previous year's balance, amounted to 143*l.* 8s. 8d., and there was a balance of 44*l.* 7s. 11d. in hand.

GLASGOW ARCHITECTURAL ASSOCIATION.—The usual monthly meeting of this Association was held on the 2nd inst., the President, Mr. William J. Anderson, occupying the chair. Mr. George Hill read a paper on "The Calculation of Strain in Roofs, Beams, and Lattice Girders," with practical demonstration, working out several examples of a kind most likely to be met with in practice. A discussion followed, and at its close a vote of thanks was passed to Mr. Hill.

Books.

Baudenkmaeler in Gross-Britannien und Irland; herausgegeben von Constantin Uhde, Professor an der Herzoglichen Technischen Hochschule in Braunschweig. Parts I. and II. Berlin; Ernst Wasmuth: London: H. Grevel & Co. 1891.

THESE are the first two parts of what promises to be a very fine collection of licht-druck reproductions from photographs of ancient buildings in Great Britain and Ireland. The first volume starts with several views of Canterbury Cathedral; followed by views of Heriot's Hospital, Cobham Hall, Somerset House, Rushton Hall, Kirby Hall, and various Colleges and other buildings at Oxford. The second part commences with views of Cambridge buildings, a view of what is oddly called in the English title the "Sermon House with the Norman staircase" at Canterbury; several fine views of Ely Cathedral, interior and exterior, and views of Lincoln and St. Paul's Cathedrals.

The buildings illustrated are well known to every one in this country who is interested in architecture, and there is no need to say anything about them here except that the selection so far seems to be made with great judgment, and that the plates are beautiful and will be valuable to English architects as illustrations of the buildings; and it is to be hoped they may do something to render ancient English architecture better known in Germany than we imagine it is at present. The collection would be far more to the purpose in this way, however, if the plates were accompanied by any kind of information as to the history of the buildings, of which there is not a scrap, Herr Uhde's duties as "editor" having been confined, apparently, to selecting the subjects to be photographed. We do not know whether there is any letterpress to come in future numbers; but none appears so far. The dates of the buildings are given under some of the plates, and occasionally an imperfect attempt to define the style; St. John's College quad for instance, being described as "Florid English or Tudor style," thus conveying to the foreign reader an exceedingly inaccurate notion of our nomenclature of styles, besides applying the term "Tudor" wrongly to a building commenced in the reign of Elizabeth, who was a Tudor certainly, but gave her Christian name and not her family name to the architecture of her epoch.

The word Transitional ("Uebergangsstil") is wrongly applied to the Lady Chapel at Ely, which is of course full Early English; while a general view of Lincoln, centre tower and all, is labelled "early and late Norman," words intended we suppose to apply to the west front only. Professor Uhde might surely have got an English architectural friend to check these nomenclatures for him, instead of thus throwing stumbling blocks in the way of German students who may wish to learn something about the history of English architecture.

Practical Rules on the Preparation of Drawings for Photographic Reproduction. By Colonel J. WATERHOUSE, B.S.C. London: Kegan Paul, Trench, Trübner & Co.; 1890.

THIS is a small but very useful book, giving information as to the methods of reproducing drawings through the medium of photography, and as to the relation of the result to the original drawing, which draughtsmen engaged in making drawings for reproduction would do well to study. The ignorance of many men who are constantly making drawings which will have to be reproduced, as to the kind of thing that will or will not reproduce, is really extraordinary. On one occasion we explained to an architect who wished to have a drawing made purposely for our lithographic plates, that photo-lithography would not reproduce tints but only lines; and that ink-photo could reproduce a tint, and that its best effect was got by drawings which were all in flat tint and showed no positive lines. This was made as clear as language could make it; and by way of profiting by our advice the gentleman sent us a drawing in line, but with the shadows washed in, thus ingeniously rendering it impossible to do justice to the drawing by either process. Colonel Waterhouse (who is Assistant Surveyor-General of the lithographic office of the Survey of India) seems to have had similar experience. He observes "The extension of the use of photographic reproduction has been greatly impeded by the difficulty of getting draughtsmen to fully understand the requirements of the different photographic and photo-mechanical methods." The author himself, however, conveys an inaccurate impression in the next sentence in saying that outline drawings "must be neatly drawn in good black ink on pure white paper." Black ink is not absolutely necessary; a red or a warm brown will do as well; what is necessary is that it should not be grey or with any tendency towards blue; which is the reason that sketches in ordinary writing ink, which often look very well in themselves will not reproduce well.

Colonel Waterhouse argues, however, that the production of drawings on purpose for photo-lithography is at variance with artistic freedom of style, owing to the necessity of drawings being made as open as possible, and with no more lines than are absolutely required. There is no doubt that some draughtsmen have the habit of drawing in a very mechanical way for photo-lithography; but it does not follow that this is necessary; what is necessary is a firm line and distinct meaning in each touch; and these are good and not bad qualities in a drawing. Our experience is that the best line drawings in an artistic sense reproduce the best: the drawings which reproduce badly are those in which the draughtsman has been scoring lines wildly on the paper, in a haphazard manner, to produce shadows, without any thought of style in drawing or texture of service.

Various processes in use for photographic reproduction are briefly described, and the style of drawing for which they are suited; but the author does not seem to be acquainted with ink-photo at all, a somewhat important omission. The remarks on the materials, paper, ink, &c., to be employed, are good and practical, and the author gives some plates showing lines reduced from a large size to various comparative scales, diagrams which we recommend to the attention of the numerous draughtsmen who cannot possibly be got to understand that if a plan is to be reduced to one-third its original size, the writing on the original must be three times as large as it is ultimately desired that it should appear. It is not too much to say that (according to our pretty large experience) not one architectural draughtsman in twenty can grasp this simple fact! Colonel Waterhouse's book is small, cheap, and practical, and we recommend it to the attention of architectural draughtsmen who will gain from it some simple and obvious information which many of them are very much in need of.

Études sur les premières périodes de la Céramique Grecque. Par P. MILLIET. Paris: Girandon, 1891.

THIS interesting book is unquestionably the fullest collective account that has been put forward (in anything like popular form) of the difficult and interesting problem connected with the archaic period of Greek vase-painting. We have nothing at all like it in English. English archæologists, and notably Mr. Cecil Smith of the British Museum, whose name is constantly cited in M. Milliet's book, have rendered signal service to the study, as, indeed, since the English excavations at Naukratis, it was fitting they should do; but we are still waiting for the handbook, which, it is understood, Mr. Smith is about to issue. Meantime, M. Milliet fills the gap for French readers, and his book has a special interest, as he announces himself to be artist as well as archæologist. We badly want artists on the subject, both for the observation of delicate gradation of style and also of technical procedure; to this M. Milliet has paid special attention, in fact the whole book is based on a thesis (presumably scholastic) maintained at the Louvre, and which runs as follows:—"Les différents procédés techniques employés pour la décoration des vases grecs n'ont pas été trouvés simultanément, mais ils se sont perpetués longtemps par tradition. Chronologiquement ils peuvent être considérés plutôt comme parallèles que comme successifs." The vases for consideration have been chosen where possible from the collection in the Bibliothèque Nationale at Paris, but necessarily large use has been made of other collections. For ourselves, we feel that M. Milliet is, as is natural, more happy in his discussion of technical matters than in his mythological explanations. We cannot agree with his polemic against Studinczka's brilliant interpretation of the Kyrene Cylix (p. 120). The small winged figures which Studinczka explains,—and we believe rightly,—as winds, bear little resemblance either in size or shape to the conventional "soul" of the Greek vase. The book, however, can be confidently recommended to all who wish to know the present state of opinion on such questions as "Chalcidian," "Proto-Corinthian," "Attico Corinthian" vases.

Hints on Wood-carving, Decorative Classes, and Modelling. For beginners. By ELEANOR ROWE. Third edition, revised and enlarged. London: School of Art Wood-carving, South Kensington; and Sutton Drowley & Co.

THIS is a new and enlarged edition of what is still however a small book, and is the most useful and practical small book for beginners in wood-carving we know of. Its former editions have received notice in these columns. The most important alteration in the present edition is in the nature and style of the illustrations given as copies to work from. We found fault formerly with the poor and weak taste of many of these, and we are glad to notice a great improvement in this respect; most of the old designs are sacrificed, and the new ones that have been inserted are very superior to them both in design and in the execution of the cuts. We recommend the book in its present form to all who are proposing to take up wood-carving, as an excellent first guide to the subject.

Auctioneers: Their Duties and Liabilities. By ROBERT SQUIBBS. Second Edition. Crosby Lockwood & Son. 1891.

IT may fairly be assumed that this book has supplied a want, having regard to the fact that this is a second edition. It certainly gives in a very readable manner a view of the general duties of an auctioneer. In truth, they are very various, and it is not surprising that in the business world a successful auctioneer holds a high place. He must be not only a man of natural capacity, but one who has carefully studied many details. He must be a man who knows how to deal with men as well as with figures, and he must have sound judgment as well. It is obvious that no book can make a



EXETER CATHEDRAL. VIEW FROM SOUTH-EAST.



A Sketch by Mr A Needham Wilson, A.R.I.B.A

first-rate auctioneer, but it is equally certain that such a work as this can give the young auctioneer a very good idea of the nature of his business.

Every one knows so well that an auctioneer must have a knowledge of many things, that it is unnecessary to go into this work with any minuteness. There are brief chapters on both the practical, the theoretical, and the legal parts of an auctioneer's duties. The only criticism we would make is, that to touch on only a few legal decisions is sometimes misleading, and that it is almost best not to give cases and names at all. Still, the work is one of such an excellent general character, and gives so much information in a compendious and satisfactory form, that this is, perhaps, somewhat of a captious criticism.

Correspondence.

To the Editor of THE BUILDER.

THE CATHEDRAL CHURCH OF EXETER.

SIR,—From a personal examination of the buttresses on the south side of the nave at Exeter I find that Carter has not drawn them as they certainly were, not only in his day, but even in the fourteenth century.

The buttresses shown on his plan represent so much of them as projected beyond the cloister alley that ran under them and abutted against the aisle wall. But the southern half of the space which Carter shows under each flying buttress is filled up solid, thereby dividing the cloister alley into a number of carrels, or studies, with a narrow passage against the church wall. The section of the buttresses as still existing is well shown by Britton on Plate III. of his Exeter section of "Cathedral Antiquities."

There are still enough remains of springers and vaulting shafts to enable the arrangement of the vaulting to be easily made out. From these we see that each bay was vaulted in two compartments, one over the carrel, the other over the passage; the passage under each buttress was also groined. The whole was covered in by a wooden roof, the marks of which are plainly visible in many places.

May I also point out that, so far from Sir Gilbert Scott having "introduced the open screen between the nave and choir," the screen is substantially the fourteenth-century *pulpitum*. Part of the "restoration" of 1871 consisted in destroying the stairs to the loft on top (still most properly occupied as of old by a "pair of organs"), as well as the panelled walls, against which stood the two altars on either side the choir door, and piercing the screen so as to make the canons' choir pretend to be the chancel of a parish church.

It is about time also that the so-called "minstrel gallery" be more properly described as the organ-loft for the services at the nave altar. A similar loft, it will be remembered, exists in the nave at Wells.

W. H. ST. JOHN HOPE.

The Student's Column.

VENTILATION AND WARMING.—XXIII.

HEATING APPARATUS.

IT is not proposed in this chapter to deal fully with the question of heating apparatus. All that we now have space for is to consider the general characters of heating apparatus, and the connexion of such apparatus with a ventilation system.

The various classes of heating apparatus may be summarised as open fires, closed stoves, hot air apparatus, hot water, either high or low pressure, and steam, either high or low pressure.

In determining which of these we should adopt in any particular instance, our first enquiry should be as to the amount and efficiency of the ventilation we propose to introduce, for it is evident at once that if we are passing large quantities of air through a building, removing it as soon as vitiated, we must choose that form of apparatus which best admits of the warming of the incoming fresh air. On the other hand, if the amount of air removed is small compared with the cubical contents of the building or apartment, and the necessity for a fresh air supply is small, we have only to provide for the maintenance of temperature when once obtained.

Let us now consider the object we have to attain in warming. This, if we look into it, is preventive, rather than active; that is, our task is, not to raise the temperature of the inmates, but to prevent their bodily heat being abstracted or more properly radiated to warm the surrounding objects. We have to prevent the walls, windows, ceiling, floor, &c., from absorbing heat from the person, and also to keep the atmosphere of the building at a sufficient temperature to ensure that it also will not be unpleasantly cooler than the temperature of the body. We say unpleasantly cooler because it is desirable for health and comfort that the temperature should be somewhat cooler. Speaking generally, a temperature of about 60 deg. Fahr. is in this country most usually pleasant and healthy, and any undue increase beyond this is both unpleasant and unhealthy. Thus we at once see that it is unsound in principle to warm a building by means of air heated to any high temperature. The highly-heated air is not either necessary or desirable for the occupants, its only object, therefore, can be to warm the environment, but in so doing it is practically impossible to avoid its contact with the person, with all the resultant unpleasantness. We have probably all of us, at some time or other, come in contact with an entering stream of heated air in some public building, and we therefore know by experience the discomfort attending the circumstances.

We arrive then at the conclusion that warming by *hot* air is a method to be avoided for the sake of the occupants of a building. All that we need is to raise the incoming fresh air to an agreeable and moderately low but sufficient temperature.

We have, however, to consider in what way we can prevent the walls, &c., from abstracting the corporeal heat. If we can find a satisfactory means of raising the temperature of the structure to a suitable degree, then there will be no undue radiation of heat from the person to warm the surroundings.

To do this, we may adopt one of the three processes by which heat is generally said to be transmitted,—radiation, conduction, or connection.

Thus, radiation is the operative method when we employ open fires, and also, to a partial extent, in the case of closed stoves. The heat is here radiated to the walls, &c., and these may not only be thus prevented from absorbing bodily heat, but may, even in their turn, radiate heat to the person. With a sufficiency of radiant heat thus acting, it is quite possible to allow, without inconvenience, a lower temperature of the air than could otherwise be endured; indeed, one of the most pleasant experiences of warming is met when we are in a room with a good fire, with the window open and cold air entering. The bodily heat lost by conduction to the cold air is immediately restored by radiation from the fire, walls, furniture, &c.

Radiation is, however, not always practically sufficient in large apartments, and we must then warm our walls, &c., by other means. The Romans, as we know, were accustomed to warm their buildings by hypocaust walls and floors,—a logical, scientific, and satisfactory manner, if somewhat expensive. They at least warmed themselves by radiation from heated surfaces, while they themselves lived and moved in comparatively cool air. The low conductivity of the materials of our walls will, however, lead us more often to warm the air next to them, so that a constantly flowing atmospheric current of raised temperature may pass over their surface, imparting to them some of its own heat.

This, then, appears to be the most logical and scientific principle which we can practically adopt for a satisfactory combined system of ventilation and warming: to admit the fresh air at as low a temperature as comfort will allow, and to warm the walls, &c., by a stream of warm air in close proximity to their surface. We shall, therefore, have within the apartment two ascending currents of air of different temperatures,—a warmer stream next the walls and a cooler stream in the body of the room. To produce the warmer stream we may employ a heating agent either within or without the apartment. Which of the two is preferable in any particular case depends upon the circumstances of the case, nor is there a great deal to be said in favour of one course over the other.

Another solution of the problem which may and has been adopted, and which possesses certain advantages both of simplicity and economy, is to so arrange our apparatus that, prior to any occupation of what may be called a hall of audience, or apartment in which considerable numbers of people are gathered together at occasional periods, the air of the apartment may be constantly changed and returned to the heating-apparatus, so that the warmed air may be led into the room, impart its heat, or a portion of it, to the walls, fittings, furniture, &c., return to be again heated, and so continue until the inanimate surroundings have absorbed sufficient heat to prevent them from chilling the persons of the occupants. Then during the session the ordinary course of the ventilation may be brought into action. In this way, without raising the temperature of the warm air to an undue degree—say, 80 deg. Fahr. as a maximum—the purity and freshness of the atmosphere may be maintained, and the solution of the problem may be satisfactorily accomplished.

We may now glance at the various forms of apparatus of which we have spoken. Of open fires it is unnecessary to say much, on account of their very limited application. Wherever possible there can be no doubt that the open fire is the most healthy and the most natural means of heating that can be adopted.

Closed stoves, often employed in country churches, are more economical, and act both by radiation and by conduction to the air. Such stoves are usually made either of iron or earthenware; the former attain a higher temperature, and are the more active in heating the air. This, however, is not altogether an advantage, because the air is apt to become over-heated, or, as it is commonly called, scorched or burnt. Earthenware stoves, such as are used in Germany, are better radiators, and less likely to scorch the air, but are apt to become leaky and permit the escape of smoke, which, of course, vitiates the atmosphere.

Hot-air apparatus, as usually so-called, is really an application of the closed stove, which is generally placed underneath the floor of the apartment to be warmed in a chamber, where the air is heated and allowed to ascend into the apartment. Such a form of apparatus may be applied to a combined system of ventilation and warming like that we have sketched. Care must, however, be taken that the air is not overheated, as is too frequently the case when such apparatus is used. The stove, or calorigen, or caloriférе, as it is sometimes called, should be so designed that considerable surface of moderate temperature is obtained, rather than a small, highly-heated surface. If the stove is of iron, this precaution should especially be attended to, as highly-heated surfaces of this material are especially detrimental to the purity and freshness of the air.

Hot-water apparatus is usually divided into two classes,—high-pressure and low-pressure. The terms "high temperature" and "low temperature," or hot water and warm water, would, however, be more correct, and more truly expressive of the difference between them. The former consists of small-bore pipes of wrought-iron, which are hermetically sealed, and in which a small body of water circulates with great rapidity at high-pressure. This pressure varies in working from 50 lbs. to 500 lbs. on the square inch, and these high figures may be exceeded in certain cases. The temperature may range from 200 deg. to 400 deg. Fahr. The chief advantages of the system are rapidity of maximum efficiency, readiness and ease of application, and the neater appearance of the small pipes. In the low-pressure system the pipes are usually 3-in. wrought-iron or 4-in. cast-iron, and contain a larger quantity of water, circulating at a lower temperature, never exceeding 212 deg., and rarely 180 deg. Fahr. By this means an even and equable temperature can be easily maintained, but the system takes longer to attain its maximum efficiency. It is less dangerous in risk of fire, and demands less skilled labour in fixing.

Steam-heating systems are not economical, unless steam is required for other purposes, save in exceptional instances. Like hot-water, it may be applied either at high or low pressure, and possesses the advantage that by its use heat is readily transmitted to long distances. Special arrangements have to be made to carry off the condensed water which forms as the steam loses its heat.

Any one of these systems may be utilised to warm the fresh air for ventilation, and the particular type to be adopted will depend upon the circumstances of each particular case.

MESSRS. CARRS' NEW BISCUIT FACTORY, CARLISLE.—In our number for the 30th ult., we described this new building. We are asked to mention that Messrs. W. Richardson & Co., of Darlington, have heated the building throughout by hot water on the low-pressure system.

SURVEYORSHIPS.

RICHMOND.—Mr. William Fairley, Assoc.-M.Inst. C.E., Engineer and Surveyor to the Kettering Local Board (formerly of the Burgh Engineer's Department, Edinburgh), has been appointed to the Richmond Main Sewerage Board.

OBITUARY.

MR. E. J. TARVER, F.S.A., F.R.I.B.A.—We regret to hear that Mr. E. J. Tarver died on Sunday last, in his forty-ninth year, after a short illness. We believe that the cause of death was pneumonia, supervening upon influenza. Feeling reference was made to his death at the meeting of the Institute on Monday evening last. By his death another District Surveyorship becomes vacant. The current number of the *R.I.B.A. Journal* says that the funeral, which took place on Wednesday, at Hampstead Cemetery, was attended by about thirty persons, including some members of the Institute, among others, Mr. Blashill, the Superintending Architect to the London Council, Mr. R. H. Carpenter, F.S.A., a newly-elected member of the Institute Council, Mr. T. H. Watson, Mr. W. White, F.S.A., and Mr. R. S. Wornum, a brother-in-law of the deceased. Mr. Alex. Beazeley, the Institute librarian, was also present. Tarver's last work for the Institute, a review of a second edition of Petit's "Architectural Studies in France," was brought by himself, quite unsolicited, about three weeks ago, when he seemed immensely impressed with his author's foresight. The review is printed in the current issue of the *Journal*.

GENERAL BUILDING NEWS.

DEDICATION OF SCHOOL CHAPEL, NEWTON-LE-WILLOW.—On the 9th inst. the Bishop of Ripon dedicated a new school chapel in connexion with Aysgarth School, Newton-le-Willow, Yorkshire. The chapel, which will accommodate 200 persons, is fitted in carved and traceried oak work. The carved work of the pulpit, reading-desk, organ-case, reredos, stall, seats, and sedilia was done by Mr. R. Hedley, of Newcastle-on-Tyne. The marble for the steps and flooring was supplied by Messrs. H. Walker & Son, and Nelson Brothers, of Carlisle. The organ has been built by Messrs. Abbott & Smith, of Leeds. The building operations, which have cost upwards of 20,000*l.*, commenced in 1888. They comprise a large schoolhouse and private residence of the Rev. C. T. Hales, with dormitory accommodation for 100 boys, boys' dining-hall, school-hall, seven class-rooms, and large gymnasium Behind the school premises, and attached thereto by a covered corridor, are the fives and racquet courts, seven in all, built upon the Eton and Harrow plans. Beyond the cricket field and two levels of tennis courts are the masters' hotel or common house, for six masters. The swimming-baths, fitted with dressing-boxes, and engine-house for the engine, which pumps water to the water tower, are on the low level of ground beyond the running-ground. In the south angle of the estate is the sanitorium, in which there are two wards and four smaller ones, convalescents' room, and nurses' and domestics' quarters. At the other angles are the two lodges, stabling, and grooms' accomodation. In the tower are several detached class-rooms for music practising. The buildings throughout are lighted with electric light, erected under the supervision of Mr. Massey. The drainage, it is stated, has been laid down on the latest known principles under the supervision of the late Mr. Slater, consulting sanitary engineer, of Leeds. The ventilation has been carefully attended to, provision being made for heating incoming fresh air in connexion with the steam-heating apparatus put in by Messrs. Walker & Son, of Newcastle-on-Tyne. The grounds and walks have been laid out and planted by Messrs. Dickson & Co., of Edinburgh, and Mack & Son, of Catterick. Messrs. Johnson & Hanby, of Stockton-on-Tees, have done all the building work of the several blocks. The joiner work, including chapel fittings, has been done by Mr. R. T. Smith, of Darlington. The other contractors were Messrs. T. Lishman, and J. J. Hope of Darlington, and Messrs. W. Lawson and Spence & Co., of Richmond. Mr. Dodds has acted as clerk of works. The buildings have been designed and erected from plans and under the supervision of Messrs. Clark & Moscrop, architects, of Darlington.

NEW GOODS STATION, BIRKENHEAD. — The Cheshire Lines Company have during the past twelve months been carrying out extensive alterations and additions at their Birkenhead Goods Station. On the 21st ult., a portion of the new station was so far completed as to enable the company to transfer all their traffic there. The building just opened is 325 ft. long by 130 ft. in breadth, and contains two platforms, 285 ft. in length, and faces Shore-road. Eight cranes worked by hydraulic power are used for hoisting purposes. A larger building, which will be four stories high, is in course of construction. The cellars have been excavated out of the solid rock, and will be divided into fourteen compartments. The entire length is 325 ft. and breadth 80 ft. The floor above is supported by brick pillars and iron girders. Seven hydraulic lifts will be used in the cellars. The next floor will be an extension of the station proper, and will contain two platforms, three sets of lines, and eight hydraulic cranes. The third floor will be on a level with Canning-street. The plans have been prepared by Mr. A. G. Scott, the company's engineer, and the building work has been carried out by Messrs. Kirk, Knight, & Co., of Sleaford. The ironwork has been executed by Messrs. F. Morton & Co., of Garston. Improvements in the yard have also been undertaken. The yard is upwards of 700 yards in length, and is being enclosed by a red brick wall. The main feature of the extensions in this department is the introduction of hydraulic power, which has been carried out by Messrs. Thannett & Walker, of Leeds. An engine-house has been erected, containing four of Thannett & Walker's patent hydraulic pumps and two pairs of engines.

PROPOSED RESTORATION OF TODDINGTON CHURCH. —At a parishioners' meeting attended by the Bishop of Southwell and Canon Andrew, of Tideswell, it has been decided, we learn, to make application for a faculty to restore Toddington Church, Derbyshire, situate half way between Buxton and Bakewell. Plans have been submitted by Messrs. Naylor & Sale, architects, Derby, and approved. An anonymous donor has come forward to restore the nave. The roofs, walls, and other parts of the church, are dilapidated.

INSTITUTE FOR WOMEN, VALE OF LEVEN.—On the 21st ult., the new Gilmour Institute for Women, erected by Mr. and Mrs. W. E. Gilmour, of Croftengen, Alexandria, and presented to the inhabitants of the Vale of Leven for the Scotch Girls' Friendly Society, was formally opened. The style of architecture of the new building is Scottish Domestic, and the structure is of red sandstone. The building is situated in Gilmour-street. The principal elevation to Gilmour-street is composed of a tower, in which is the main entrance. The vestibule communicates with the entrance-hall. Along the back extends a corridor or cloister, from which access is obtained to the library (30 ft. by 20 ft.), and class-room (20 ft. by 14 ft.), also to the common hall (52 ft. by 30 ft. by 37 ft. high), having small gallery at end. The floors of the rooms are inlaid oak. On the panels of the large hall and cloister a series of oil-paintings, by Mr. Harrington Mann, Glasgow, are being placed. The east portion of the building is the bath department, containing four bath-rooms, cloak-room, lavatory, and other accommodation. At the north side of the building is situated the garden grounds, on which a tennis-court is to be made. The cost of this Institute when complete will be about 12,000*l.* The architects were Messrs. J. Burnet, Son, & Campbell, Glasgow.

RESTORATION OF CARLTON-LE-MOORLAND PARISH CHURCH.—The parish church of Carlton-le-Moorland, Lincolnshire, has just been opened after restoration. The building is of the Elizabethan style, and consists of a square tower, a nave with central aisle, square-headed windows, low-pitched leaded roof, with battlemented walls; chancel with high-pitched tiled roof; and a north chapel. The chief features of the restoration are the rebuilding of the north and east walls of the north chapel; the substitution of Ancaster stone window sills and mullions for wooden frames in chancel and north chapel; the re-glazing with straw-coloured glass of the windows (except the east window and another small one, which are now filled with stained-glass); the re-timbering and re-leading with new material of the roofs of tower, nave, and north chapel; the fixing of a Grundy's patent heating apparatus; the re-seating of the nave with oak seats, and re-laying the floors of nave and north chapel with patent wood blocks, and part of chancel with new stone steps and flooring. The architect was Mr. Hodgson Fowler, F.S.A., and the contractor for the work was Mr. C. Baines, of Newark.

NEW CHAPEL FOR THE LITTLE SISTERS OF THE POOR, PLYMOUTH.—At Hartley, Plymouth, on the 26th ult., the chapel attached to St. Joseph's House, a home for aged men and women, under the care of the Little Sisters of the Poor, was formally opened. The building will accommodate about 200. At the northern end is a small gallery, the chancel being at the opposite extremity. Over the altar,—which is of carved oak, and the work of a former inmate of the Home, -has been placed a figure of the Virgin, on the left being a representation of St. Joseph, and on the right one of St. Augustine, the patron saint of the order. The ceiling is of red pine, the roof being very massive, and consisting of arched ribs resting on moulded corbels of Polyphant stone. Niches, for the figures, piscinas, stoups, door jambs, and the ornamental wall lining are also of Polyphant stone. Teak and red deal are the timbers used in the flooring, the altar-rail being of wainscot. Vestries are provided at each side of the chancel. The exterior is of limestone nobbling, the inside wall is 9 in. brickwork, and the roof is covered with Delabole slates. Mr. Tasker, of London, is the architect, and Mr. Philip Blowey, of Plymouth, was the contractor.

RE-OPENING OF PARISH CHURCH, GOGAR, N.B. — On the 26th ult., the parish church of Gogar, which has recently been restored, was re-opened. The building, says the *Scotsman*, is practically a new one; for in the year 1602 services at Gogar were discontinued, and the parish was annexed to Corstorphine. Some time ago a scheme was set on foot to restore the old ruin and provide the parish with a suitable building for its needs. Sufficient subscriptions having been collected, building operations were commenced last year, Mr. Jas. Williamson, Edinburgh, being the architect. The new church is in the Early Gothic style, in which some parts of the old edifice have been incorporated. It has been built at a cost of about 600*l.*, and will seat 150 people. It is intended to add a tower, but at present sufficient funds have not been gathered to carry out the whole of the scheme.

SANITARY AND ENGINEERING NEWS

SEWERAGE, RAWTENSTALL.—An inquiry into an application by the Rawtenstall Corporation for sanction to borrow the sum of 52,000*l.* was held in the Municipal Offices by Mr. Arnold Taylor, an Inspector of the Local Government Board, on the 2nd inst. This sum is required for the purpose of carrying out a complete scheme of sewerage throughout the district in accordance with plans prepared by Mr. J. E. Swindlehurst, C.E., Borough Engineer of Burton-on-Trent. Mr. Swindlehurst explained the proposals in detail to the Inspector, and it is intended, so soon as sanction has been obtained, to proceed with the work. This will embrace the construction of about 33½ miles of brick and pipe sewers, varying from 3 ft. to 9 in. in diameter. The carrying out of the work has been placed in the hands of Mr. Cutler, C.E., the Borough Surveyor of Rawtenstall.

WATER SUPPLY OF LEOMINSTER.—On the 3rd inst. Mr. Thomas Codrington, M.Inst.C.E., held an inquiry on behalf of the Local Government Board into an application made by the Town Council for sanction to borrow 1,300*l.* for the purposes of an additional water supply. Evidence was given of the want of water, and the Council proposed to take a supply from a place called the Midsummer Meadows, near their present works. There was some opposition to the scheme, and the Commissioner intimated that its advocates had not shown there was a sufficient quantity of water in the meadow to supply the town.

GRAYS SEWERAGE.—A Local Government Board Inquiry was opened on Wednesday, May 27, and adjourned to Tuesday, June 2, to inquire into an application from the Grays Local Board to borrow 30,000*l.* to carry out a scheme for the sewerage and sewage disposal of Grays, in Essex. Mr. J. T. Harrison was the Local Government Board Inspector who conducted the inquiry. Mr. W. H. Radford, C.E., of Nottingham, is the engineer for the scheme, and his plans were selected as the result of a public competition. Mr. Radford had prepared alternative schemes for the disposal of the sewage, but the sewerage arrangements in the town were the same for both schemes. The Local Government Board were first asked to approve a scheme for delivering all the sewage of the town to one point by gravitation, and then pump it a lift of 97 ft. to Lodge Farm, where it was proposed to purify it by irrigation on 93 acres of land. This application was opposed by the South Essex Water Company and various local authorities who use that company's water. It was said that the water-supply would be polluted through the effluent getting through the chalk strata into the company's well, which was situate about a mile away from the farm. The company were entitled to drive headings in the chalk to within 440 yards of the farm. The chalk strata at the farm was covered by Thanet sand, varying from 8 ft. to 35 ft. in thickness. The Local Board's engineer contended that, as the large fissure in the chalk invariably ran from north-west to south-east, and the farm was situate to the north-east of the company's well, none of the effluent would get into the company's supply. Moreover, the sewage of Grays is at present poured into the chalk through various dumb wells in a line with the chalk fissures, and it was very desirable to discontinue that system. Opposition to this scheme was also made by the owners of a brewery, as they believed their water also might be contaminated. At the adjourned inquiry the Grays Local Board presented a resolution asking the Local Government Board, if they decided to refuse the irrigation scheme, to approve the alternative scheme for the disposal of the sewage by means of precipitation tanks, to be erected near the Thames, the loan being then reduced to 26,000*l.* The Inspector therefore considered and received evidence with respect to the "tank" scheme. The sewage would have to be lifted into the tanks and treated with chemicals, and the effluent would then be discharged into the river at the ebb tide by gravitation. The population of the town is 12,000, but it was proposed to provide for 30,000. It was proposed to have separate systems of sewers for sewage and surface water. Ample arrangements were made for flushing, ventilation, and storm overflows. The surface water would be delivered by gravitation into the storage creeks, which would run out with the tide at low water. A very large set of plans and details were produced, and Mr. Radford explained them fully to the Inspector. There was very little

opposition to the alternative "Tank" scheme. The Inspector will report to the Local Government Board, who will give their decision presently.

MEASURING STRAINS IN BRIDGES.—M. Le Chatelier describes in a recent number of the *Annales des Ponts et Chaussées* a method which he has adopted for measuring the strains in an iron or steel bridge. For this purpose a bracket carrying a lathe centre is attached by small screws to the member the strain in which is to be measured. At another point of this bar a second bracket is fixed, in which slides a short steel rod pointed at both ends like a lathe centre. Attached to the same bracket is a water chamber closed by a flexible diaphragm of German silver, and connected to a fine open tube, in which the water, on being expelled from the chamber, flows and serves to measure on a highly magnified scale any motion of the diaphragm. One end of the double centred rod presses against this diagram, and a bar is supported on the other centre point of this rod, and on that of the fixed bracket before mentioned. Any extension of the bridge member, therefore, causes a motion of the diaphragm and a fall of the water in the fine tube. Successful measurements are said to have been made on this system when the fixed points between which the extension was taken were only 8 in. apart.—*Iron and Coal Trades Review.*

STAPLEFORD AND SANDIACRE WATERWORKS. The works for the supply of water to these two places have now been successfully completed. The pumping-station, with well, has been put down to pump water from the Bunter Sandstone into a summit service reservoir from which a population of about 7,500 would be supplied by gravitation. A number of consumers were last week supplied with the water. The engineer to the scheme was Mr. W. H. Radford, C.E., of Nottingham.

KEGWORTH SEWERAGE.—Mr. W. H. Radford, C.E., of Nottingham, has been instructed by the Shardlow Board of Guardians to prepare a scheme for the sewerage and sewage disposal of Kegworth. Negotiations have been some time in progress to acquire land for sewage irritation purposes.

FOREIGN AND COLONIAL.

FRANCE.—The agents of the department of "Ponts et Chaussées" are generally little careful of the ancient remains, megalithic monuments, dolmens, &c., so common in France. The Administration of Fine Arts has frequently called attention to their sins in this respect, and the Minister of Public Works has addressed a circular to the engineers-in-chief recommending them to watch carefully over all such monuments and respect their archæological value.——M. Antonin Proust has been appointed Commissioner-General of the French Fine-art Section of the Chicago Exhibition.——M. David Dautresme, General Secretary to the French Exhibition at Moscow, has been recalled to France, and M. Léon Dru, Engineer of Mines, appointed in his stead.——M. Homolle, the Director of the French School at Athens, is in communication with the Greek Government in regard to entering on possession of the ground on which the Delphi excavations are to be made.——The Bridges Committee of the Chamber of Deputies has voted 100,000 francs for the restoration of the Roman theatre at Orange, and the authorities of that town have added a vote of 30,000 francs for the same purpose.——The municipality of Nancy has on hand a scheme for the erection of cheap lodgings for working-men in that town.——The service of Ponts et Chaussées is studying the question of the crossing of the Seine at Tancarville. The passage of trains will probably be effected by a metallic tubular tunnel under the river, like the one recently established under the Thames.——A competition has been opened for the appointment of a professor of drawing and design for the École Nationale des Arts et Métiers at Angers.——The town of Fontainebleau has opened a competition for the erection of a savings-bank, limited to architects of the departments of the Seine, Seine-et-Oise, and Marne.——The Minister of Public Works has gone to study on the spot the problem of the prolongation of the Canal de la Sauldre to connect with the lateral canal of the Loire by Compant and Vailly.——The town of St. Etienne will open an art exhibition on August 3, to remain open till the end of September.——The eighth exhibition of the Société Artistique de Roubaix-Turcoing will be held this year at Turcoing, from September 20 to October 30.——The fine-art exhibition at Rouen will open from October 1 to November 30.——The fine art exhibition just opened at Avignon contains over six hundred works of painting and sculpture, and also various architectural designs by MM. Baussan, Duvernet, Massillon, Rouvet, and Fourtel.——The Chamber of Commerce at Lyons has just inaugurated the new galleries in its Museum of Industrial Art, at the Palais de Commerce.——A statute of General Beaupuy is to be erected at Mussidan (Dordogne).——A statue of General Raoult will be inaugurated at Meaux on July 26. The sculptor M. Aubé.——Owing to the death of Crapu, and the nomination of M. Guillaume to the Directorship of the Villa Medicis, two professorships in modelling have become vacant at the École des Beaux-Arts.——A competition is to take place for the appointment of three diocesan architects.——M. Louis Dumoulin has been appointed painter to the Ministry of Marine.——M. Decron, the architect, is to commence almost immediately the works for the École Professionnelle de Meuble, rue de Reuilly.

BERLIN.—Herr Oberbaurath Hermann Ende, Vice-President of the Prussian Royal Academy, head of the well-known firm of architects, Ende & Boeckmann, has been nominated a Knight of the "ordre pour la mérite" for Arts and Sciences, the Emperor conferring this, the highest of Prussian orders of the kind, on him with special honours. Herr Ende is the only architect among the sixty Knights, of whom thirty are Germans and thirty non-Germans, or honorary Knights. Herr Hitzig was the last architect who attained this honour.——The *Baugewerks Zeitung* tells us that the activity in the building trades during the year 1890 was far larger in this city than was generally supposed, the wages paid to artisans during this year amounting to some 54,000,000 marks, as against the 50,500,000 marks registered for 1889. Owing to the great numerical increase of workmen coming into the city from the northern and eastern provinces of the Empire, the prosperity in these classes was not up to the average, the demand for work during the summer being above that of the year before, and discontent prevailing.——To show how the activity in building has increased this decade, we notice that whilst the average annual expenditure of the municipality for new works reached 2,968,000 marks between 1874 and 1884, 6,825,000 marks was the figure between 1885 and 1889, and in this year it has reached 9,644,000 marks.——The jury at work in the International Art Exhibition has now completed its task. Before parting the members were entertained by the Exhibition Committee, which was in return invited to the dinner given by the non-German members to their German colleagues.——The Amalgamated Societies of German Architects and Civil Engineers have elected to hold this year's annual meeting of delegates at Nürnberg. After the business of the Society has been gone through, a number of technical questions are to be discussed; among these those referring to "Lightning Conductors on Buildings," "Smoke Nuisance in Cities," and "Fireproof Building Construction" are likely to prove of general interest. The opening of the meeting is to be on August 7.——Professor Koch's new "Institute" will be opened on July 1. The hospital barracks of the clinical division are completed, and are now being furnished and having the finishing touches put to them. The old building which has been adapted for the research division is also ready.——Of the proposed new theatre buildings we referred to as being likely to be erected in the city (see page 197), one is to be taken in hand at once, the designs for it having been approved of by the Fire Brigade and Municipal authorities. The design for a second one was refused point-blank on account of the unsuitable site chosen in the inner town, and the bad planning as regards safety.——The two sets of double lines of the railway track running on the great railway viaduct that goes through the city are being relaid, wooden sleepers of the old pattern being this time used in lieu of the former iron ones, which did not prove satisfactory.

HAMBURG.—There is some talk about forming a subway under the Elbe, large enough to serve for vehicular and foot traffic between the two sides of the river. The preliminary estimate for this work is over a million sterling.

KIEL.—The erection of a railway and road traffic bridge of some importance has been taken in hand on the North Sea Baltic Canal Line, near Grünenthal. This bridge, constructed entirely in iron, will have one span only, the span measuring 156 mètres across. The roadway, on the centre of which the single-line railway track will be laid, is to have a width of about 10 mètres; its height over average water level of the canal being 42 mètres. The architectural features at either end of the bridge are to be of brick with freestone facings and have been designed by Herr Baurath Eggert, of Berlin.—*Centralblatt der Bauverwaltung.*

CONSTANCE.—A large block of Post-office buildings was opened here last month, on a site off the "Bahnhofsplatz." It is a brick and stone building in the Renaissance style. Herr Buddeberg was the architect.

WARSAW.—The usual quinquennial meeting of the Vistula River Regulation Commission, which consists of Russian and Austrian members in equal numbers, takes place at Warsaw this month, and is expected to last two or three weeks, as there is a good deal of work to be got through. This mutual agreement between Russia and Austria of having a commission for the general management of the river regulation is of old date; this year's meeting being the fourth at which a full programme for the work to be done in the intermediate five years has to be made out, and a report on the works carried out has to be gone through. The Commission sits alternately at Warsaw and at Krakau; some official ceremony in form of a reception to the members always takes place at the commencement, this time the Imperial Governor Gurko did the honours. As regards the works being carried out on the river we are only able to state that some activity seems to prevail, and yet the time estimated sufficient for carrying them out, twenty years, has come to an end, and we hear of fifteen years more being required with an enormous extra outlay (some 3,000,000 roubles for each country).

MISCELLANEOUS

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The closing meeting of this Association for the session 1890-91 was held on Wednesday, June 3, Mr. J. W. Grover, F.S.A., in the chair. Mr. Loftus Brock, F.S.A., rendered a description of the works now being carried on along the western portion of the north wall of Chester, where search is being made for sculptured and inscribed stones, at the expense of the fund raised by Mr. Haverfield. A large number of important finds have been made, and the ancient city wall proves to be of same construction here as at other portions, namely, of a facing of carefully-squared stones of large size, with a core of masonry, not so evenly dressed, in which the sculptured stones are being found. All this portion is of Roman date, and erected without mortar, the sculptured stones being derived from earlier Roman buildings, also unmortared. Mr. Macmichael exhibited some curious examples of Brown ware, with patterns laid on in slip, of seventeenth century date, found at Whitechapel. Mr. Wood described some portions of heavy cast lead and welded lead pipes, the earliest laid by Myddelton's New River Company, which have recently been exhumed at Saddler's Wells. Mr. Earle Way exhibited a further find of Roman pottery from Southwark, the most curious objects being the appendages of a lady's chatelaine. A paper was then read on the antiquities of Crowland, prepared by Mr. Canham, but read by Mr. Rayson in the author's absence. Apart from the history of the Abbey, the author made interesting references to many evidences of population in the district in prehistoric times which have hitherto not been recorded. The second paper was by Mr. H. Syer Cuming, F.S.A. Scot., in which the various forms of Samian ware were noted, and references rendered to a great many writers of antiquity, from which the ancient names of the articles were suggested for adoption. The paper was illustrated by a fine series of drawings of the various forms. The third paper was on Penenden Heath, Kent, by the Rev. Cave Browne.

TENCH-STREET RECREATION GROUND, WAPPING.—This new recreation-ground for the East-end of London was formally opened on Monday last by the London County Council. It is situate in the midst of narrow streets, some flanked by lofty warehouses, with occasional glimpses through open basements and narrow passages of the river Thames, others lined with crowded tenements, and intersected by narrow squalid alleys. Here and there a substantial building or a massive quay gives evidence of the opulence of trade, and occasional vistas of lofty masts and yards in unexpected places reveal the proximity of the docks surrounding the district, which is literally an island in the strictest sense of the word. The new recreation-ground is opposite Wapping Church. Here, ten years ago, stood a labyrinth of small, confined tenements. So long back as 1875 this area was reported to the late Metropolitan Board of Works as unsanitary, under the provision of "Cross's Act." It was really one of the very first sites dealt with under that Act. The matter was, however, delayed for various reasons, but in 1883 the Board passed a scheme through Parliament, and in due course the claimants were dealt with, and the ground cleared. Between 100 and 200 houses were removed from an area of little over 2½ acres. It was intended to have erected model dwellings upon the site, but it being found that there was really no demand for such accommodation, and that the land would not let for that purpose, the County Council, after referring the matter to the Parks Committee, decided to lay the space out for recreative purposes, and this has now been done. It cannot perhaps be deemed, as others of our open spaces justly are, as a necessary lung, for the district is unusually fortunate in the open surroundings afforded by river and docks, but it is a valuable acquisition to a neighbourhood previously destitute of any such provision for the recreation of its crowded and hard-working population. The ground has been laid out in simple and unpretentious style. There is a large principal open gravel space surrounded by shrubberies. This occupies rather more than half the area, and will afford ample playground for children, or for band performances, which will probably occasionally be given, if the Council is able to complete its arrangements for a municipal band. The remainder of the main space is laid out more closely as a garden, one feature being a fountain in terra-cotta, by Messrs. Doulton. A detached corner is reserved for a gymnasium, and here will probably be added a covered shelter in which children can play during the rain. The ground has been laid out from the designs of Mr. Sexby, the Council's landscape gardener, and the works have been executed under his supervision by the Council's own staff. This is one of the first completed works so dealt with by the Council.

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised	Premiums.	Designs to be delivered.
*Swimming Bath	Sch. Bd. for London ..	Not stated	July 18

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Yellow Deal Blocks	St. Pancras Vestry	W. Booth Pcott	June 15
*Tar and Asphalte Paving Works	Tottenham Local Bd.	J. E. Worth	June 16
*Road Works	do.	do.	do
Nurses Residence at Asylum, Wakefield ..	West Riding C. C.	J. V. Edwards	do.
Footpaths, &c. Abbey Town	Holme Cultram L. B.	R Stubbs	do
*Stone Bridge over River Waver	do.	G. Armstrong	do.
*60 Fathoms of Yellow Deal and Batten Ends	Eton Union	*Official*	do.
New Schools	Wallsend School Bd.	Wm Hope.....	June 17
Sewerage Works	North Dublin Union	*Official*	do.
Sixteen Houses, Stanley, Durham.....	West Stanley Co-op. S.	J. W. Roauthwaite ..	do.
Stores and Stabling at Swallow Nest.....	Masborough Equitable Pioneers Soc. (Ltd.)..	J. Platts.....	do.
Waterworks	Shipley Local Board..	W. B. Woodhead & son	do.
Pair Semi-detached Houses, Torquay-road, Newton Abbot	.....	J. W. Rowell & Son ..	do.
Dwelling-house, Stabling, &c. Fishacre Farm, Totnes	W. H. Punchard.....	J. C. Tanner.....	do.
*Painting Works, Woolwich	War Dept.....	*Official*.....	do.
*Rebuilding Bridge	Middlesex C. C.	do.	do.
*House and 10 Cottages at Kemble	Gt. Western Ry. Co..	do.	do.
Four Houses, Shop, &c. Hunslet, Leeds ..	.....	J. E. Leak.....	June 18
Timber	South Hetton Coal Co. Ltd.	.....	do.
Main Drainage (two contracts).....	Southill Nether (Dewsbury) Local Board ..	*Official* ..... {	do. June 25
*Sewerage Works.....	Dartford Union R.S.A.	do.	June 18
*Widening Pier Head, Landing Stage, &c.	Brighton West Pier Co.	R. W. Peregrine Birch	do.
*Underground Urinal	Lambeth Vestry.....	*Official*	do.
*Chapel, Lechdale	The Trustees	— Lansdown	do.
Alterations to Albert Hall	Swansea Public Hall Co. Lim.....	Edwd. Bath	do.
*Scavenging, Dusting, and Watering.....	Bethnal Green Vestry	F. W. Barratt	do.
Laying Water Mains, &c.	Newhaven Union	*Official*	do.
Lighting, &c. Town-hall and Public Offices	Wednesbury Town C.	Wood & Kendrick	do.
Reconstruction of Bridge, Chilbolton	Southampton C. C. ..	Jas. Robinson	June 19
Two Dwelling-houses and Shops, Aberlour, N.B.	.....	A. & W. Reid	June 20
Quay Wall, Deepening Channel, &c.	Exmouth Harbour Trustees	T. Meik & Sons	do.
*Isolation Hospital	Swindon New Town Local Board	H. J. Hamp	do.
*Top Soil for Marine Gardens Improvement....	Folkestone Corp.	*Official*	do.
Wrought-iron Girder Bridge, Retaining Walls, &c.	Newcastle-on-Tyne Impt. Com.	do.	do.
Asphalting and Street Work	Ripley Local Board ..	do.	June 23
*School at Manor Park	Little Ilford Sch. Bd.	R. L. Curtis.....	do.
*Three Through Houses Queen's Rd Halifax	.....	Jas. Farrar	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Road Materials	Haywards Heath L. B.	*Official*	June 22
Hot Water Supply, &c. Workhouse	Northampton Union Guardians	do.	do.
*Supplying and Laying Tar Paving.....	Beckenham L. B.	G. B Carlton	do.
*Officers' House, Pailing, nr. N. Yarmouth	Admiralty.....	*Official*	June 23
*Public Elementary Schools	Howe School Board ..	T Simpson	do.
*Road Works	Lewisham Bd. of Wks	*Official*	do.
*2,000 tons Broken Guernsey Granite.....	Mile End Old Town Vestry	J. M. Knight	June 24
*10,000 feet Tooled York Paving	do.	do.	do.
Additions to School	Northop School Board	*Official*	do.
*Broken Guernsey Granite	Middlesex C. C.	do.	June 26
*Erection of Stables and Cottage.....	Walthamstow Loc. Bd.	G. W. Holmes.....	do.
*Making-up and Concrete Paving Roads ..	do.	do.	do.
*Sewers Work	do.	do.	do
*Removal and Reconstruction of the Six Gates, Barking-hill.....	Essex Sewers Commrs.	J. H. Barnes.....	June 27
*Pavior's Work	Vestry of St. Mary, Islington.....	*Official*	June 29
Cast-iron Footbridge, Sluice, &c.	Swansea T. C	do.	do.
*Additional Wards and Workrooms at Workhouse	Hackney Union	do.	July 1
*Construction of Reservoir	Bideford Corporation	Baldwin Lathem	do
*Alterations, &c. Western Fever Hospital..	Metropolitan Asylum Board	A. & C. Harston	do.
*Alterations and Additions to Workhouse, &c.....	Fulham Union	H. Saxon Snell	July 2
*Underground Urinals	Com. of Sewers	*Official*.....	July 3
*(1). New School Buildings; (2) Taking Down Buildings and Constructing Administrative Block, Wards, Boiler House, &c.	Worcester Union	H. Rowe & Son.....	July 8
Alterations to Tavern, Wallsend	W. Beal.....	Mr. Bennett.....	No date
Store Buildings	Gateshead Indust. Co-op Soc.	Oliver & Leeson	do.
Fifty Houses, Orgreave, near Handsworth	Sheffield Solvo Laundries (Lim.)	E. Winder, Jun.....	do.
Steam Laundry	Ely Tin plate Co.	A. F. Watson	do.
Five Cottages, Llantrisant, S. Wales	W. H. Baxter	H. E. & A. Bown.....	do.
Detached House and Stabling, Walker-road, Harrogate	Miss Bradshaw	.....	do.
Six Houses, Ringsley, St.-Os	Harborne Sch. Bd....	F. J. Gill	do.
*New Junior and Infants' Schools	.....	C. M. Thornton	do.
Block of Houses, Beeston-hill, Leeds	.....	J. Athron.....	do.
Stone Fence Walls and Gateways, Christ Church Schools, Armley, Leeds			

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
Surveyor and Inspector of Nuisances	Brixworth R. S. A. ..	110*l.*	June 17
*Storekeeper.....	Battersea Vestry	100*l.*	June 18
*Surveyor	Kettering Local Board	200*l.* &c.	June 22
*Road Foreman	West Ham Corporation	2*l.* week.....	July 4

Those marked with an Asterisk (*) are advertised in this Number. Competition, p. iv. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xx.

STREET IMPROVEMENTS AT DERBY.—On the 6th inst., Colonel C. H. Luard, R.E., a Local Government Board Inspector, held an inquiry at the Town-hall, Derby, concerning the application of the Corporation to borrow about 12,000*l.* for works of street improvement. It is intended to widen King and Queen streets. Property belonging to several owners has already been conveyed to the Corporation, others being in negotiation, and about 7,000*l.* was asked for, although the whole cost will be considerably more. It is also proposed to improve Monk-street and Burton-road, and an additional 150*l.* was asked for in respect of the extra work about to be undertaken in connexion with the Fire Brigade Station. There was no opposition.

PROPOSED PARK FOR HANLEY.—An inquiry was held on the 5th inst. at Hanley, before Colonel Luard, R.E., a Local Government Board Inspector, touching the application of the Town Council for sanction to borrow 50,000*l.* for providing public walks and pleasure grounds. The Town Clerk pointed out that Hanley contained a population of over 56,000, which was increasing by 1,000 yearly. Since its incorporation in 1857 the necessity for a public park had been frequently acknowledged. It was proposed to purchase 106 acres of land, known as the Shelton Park and Cauldon Grounds site, at a cost of 42,000*l.*, or 392*l.* per acre, and to sell some portion of the land for the erection of villa residences. Upwards of 10,000*l.* it was estimated, would be realised from this. The laying-out and fencing of the park would cost 15,000*l.* Mr. George Meakin had offered 5,000*l.* towards the cost of a park, and the School Board had applied for part of the land for the erection of a higher grade school. Mr. J. Lobley, Borough Engineer, spoke as to the value of the land, and after further discussion the inquiry was closed.

THE HARDY PATENT PICK COMPANY, LIMITED, is, we understand, being reconstructed, with a view to largely developing their business, and, to carry out this arrangement, the old company is being wound up voluntarily. The new company will take over all assets and liabilities of the old firm, and will be carried on under the same name.

THE ENGLISH IRON TRADE.—There has been but very little business in the English iron market, buyers holding back to await further developments. Nearly the whole of the Scotch warrants are now in the hands of the London syndicate, and it remains to be seen whether they will dispose of them at the present comparatively low price, or retain them until a better figure can be obtained. Middlesbrough pig is 9d. lower on the week, and mixed numbers of Bessemer pig in the north-west have declined 1s. There is rather more activity in Scotch makers' iron. In the finished iron trade there is no material change to record. Tin-plates are in better demand at lower prices. Although there is a fair amount of activity noticeable in the steel trade, the prospects for the future continue very dull. Engineers are experiencing a slackening-off in orders, and prices of coal show a slight tendency towards a decline.—*Iron.*

PREVENTION AND EXTINCTION OF FIRES IN THEATRES.—Under the will of Dr. Fothergill (1821), funds were bequeathed to the Society of Arts for the offer of medals for subjects, in the first instance, relating to the prevention of fire. A Society's Gold Medal, or 20*l.*, is now offered for the best invention having for its object the prevention or extinction of fires in theatres or other places of public amusement. In cases where the invention is in actual use, reference should be made to places where it could be inspected. A full description of the invention, accompanied by such drawings or models as are necessary for its elucidation, must be sent in on or before December 31, 1891, to the Secretary of the Society of Arts, John-street, Adelphi, London.

ROYAL METEOROLOGICAL SOCIETY.—On May 20, the offices and library of this Society will be removed to more commodious rooms at 22, Great George-street, Westminster, S.W.

LEGAL.

CASE UNDER THE METROPOLITAN BUILDING ACT:

WHAT IS "INCOMBUSTIBLE" ROOFING?

At the North London Police-court, on Wednesday, Mr. Haden Corser, the magistrate, gave his decision in the case of "Payne *v.* Wright," which was a summons taken out by a District Surveyor in the employ of the London County Council against Mr. Wright, managing director of the New Wire Wove Roofing Company, Queen Victoria-street, City, for covering a roof with a combustible material, contrary to the statute.

Mr. Corser, in giving judgment, said (according to the *Times'* report) that the substance in respect of which the County Council had taken out this summons was known as "duroline." The foundation of the material was iron wire, and the outside was composed of an oleaginous substance, which was the subject of some patent. He had, in open Court, experimented with the material, and found that whilst under certain circumstances the outside of the material would burn, the foundation of wire would not burn, except under heat which would destroy slate, tiles, or metal, which were allowed as roofing substances by the London County Council. It had been said that this "duroline" was a good substitute for glass, but with this he had nothing to do. He had merely to consider as to the intention of the Act of Parliament with regard to roofs. This, of course, had reference to the safety of the public. It had been given in evidence that the Westminster Aquarium was covered with this material in substitution for glass, and that a man might walk upon it in order to clean it. There was further evidence from the insurance people that many fires were continued from house to house because of sparks and burning embers falling through glass. His experiments with this material showed that burning sticks placed on a flat piece would in time ignite the outside, but a piece that had been in use four years would not light at all. Looking at the substance before him, and the meaning of the word "incombustible" as combined in "slates, tiles, and metals," mentioned in the Act, he came to the conclusion that the defendants had not contravened the Act.

Mr. Gill said he was surprised at the County Council taking action after the decision in the Aquarium case.

Mr. Corser gave the defendant ten guineas costs.

CAPITAL AND LABOUR.

THE LOCK-OUT OF CARPENTERS AND JOINERS IN LONDON.—Notwithstanding some statements to the contrary, the position of things is not much changed at the time we go to press. We hear that Messrs. Mowlem & Co., one of the firms originally struck against, have got between twenty and thirty joiners and carpenters at work. We hear that the non-union men are getting very discontented at the small amount of money they were paid,—stated to be only 8*s.* 6*d.* on Saturday last. The assertion of the men that they are confident of being victorious in the course of another week or two is spoken of by the employers as "all bounce." It is reported that fresh masters are locking out and reducing hands daily.

NOTTINGHAM BUILDERS' LABOURERS' SOCIETY.—On Saturday afternoon a special meeting of the local branch of the Amalgamated Society of Builders' Labourers was held at the "Dove and Rainbow," Parliament-street, Nottingham. There was a very large attendance. Mr. W. Mansell, the President, occupied the chair. After a number of new members had been admitted, a discussion took place as to whether some action should be taken in the case of a number of firms who at the present time were paying less than the standard rate of wages,—viz., 5½*d.* per hour. It was ultimately resolved to compile a list of the firms who were paying the standard wages, and endeavour to get it recognised throughout the town, and Mr. George Richards (secretary) and Mr. Coggles (check secretary) were elected to attend the conference at Birmingham.

MEETINGS.

SATURDAY, JUNE 13.

Royal Institution.—Professor A. H. Church, M.A., F.R.S., on "The Scientific Study of Decorative Colour." II. 3 p.m.

Incorporated Association of Municipal and County Engineers.—Eastern Counties' District Meeting at Norwich.

St. Paul's Ecclesiological Society.—Visit to Guildford, under the guidance of Mr. Ralph Nevill, F.S.A.

TUESDAY, JUNE 16.

Royal Statistical Society.—Mr. Noel A. Humphreys on "Results of the Recent Census, and Recent Death-rates in the Largest English Towns."—7.45 p.m.

WEDNESDAY, JUNE 17.

Society of Engineers.—Visit to the Linde British Refrigeration Company's Ice Works at Lower Shadwell and the City and South London Electric Railway Company's Depôt at Stockwell.

Royal Institution.—Faraday Commemoration Lecture, by Lord Rayleigh, M.A., F.R.S. 4 p.m.

Royal Meteorological Society.—Five papers to be read. 7 p.m.

THURSDAY, JUNE 18.

Society for the Encouragement of the Fine Arts.—Morning Meeting.

Society of Antiquaries. 8.30 p.m.

Dundee Institute of Architecture.—Annual Business Meeting. 8 p.m.

SATURDAY, JUNE 20.

Dundee Institute of Architecture. — Excursion to Anstruther, Elie, and District.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

9,403.—PIPE JOINTS: *G. Harvey.*—According to this invention, the upper end of one pipe is made (as usual) with an enlarged socket, into which the lower end of the pipe above fits, an air-tight joint being made between them by a ring of india-rubber or such like material forced into the socket. The support is made to furnish a connexion of this sort, while studs fixed in a semi-circular bracket serve to hold the pipes, by means of the gland, securely in their place against the wall.

11,089.—WATER-CLOSET APPARATUS: *T. Farmiloe and others.*—To ensure the proper flushing of the basin and trap, the flushing-tank has two outlets, differing in size, one, the larger, leading to the basin, and the smaller to the trap. These two outlets are controlled so that both can be closed and opened simultaneously or otherwise, and both the basin and trap be thoroughly flushed.

1,300.—COWL FOR SMOKY CHIMNEYS: *P. L. Rogers.*—This patent refers to a cowl with movable self-acting doors or flaps fitting inside of pot, closing themselves by the action of the wind blowing down upon them, so stopping down draught, and at the cessation of the wind re-opening by their own or counterbalance weight.

5,839.—DRAINAGE PIPES: *C. Thompson.*—The length of pipe and diameter of socket is increased to enable a loose collar or sleeve to be inserted, the external diameter of which corresponds with the internal diameter of the socket. A joint can be made so that the inner circumference of the pipe proper and the socket are level, and nothing affects the flow in the pipe.

5,948.—WINDOW AND DOOR SILLS: *E. F. Hutchings.*—The essential feature of the improvement consists in providing a sink, chamber, or pocket in the part of the sill underneath the window, with a channel leading from the pocket to the front of the sill to drain off the water.

5,954.—WOOD SCREWS: *C. D. Rogers.*—The point portion of the screw is provided with an unthreaded sharpened entering end or spur, either conical or pyramidical in form, to the other portion, having one or more screw-threads integral with the screw-threads formed on the body of the screw. The diameter of the body and of the entering end is the same. The screw is self-centreing, and the operation of driving it into the wood does not rupture the fibres.

NEW APPLICATIONS FOR PATENTS.

May 25.—8,815, W. Trousdale, Door Latches, &c.—8,816, J. Jones, Sash Windows.—8,831, R. Westplalen, Metallised Plates or Fabric of Asbestos, &c., for Roofing, &c.

May 26.—8,903, R. Warwick, Fire-proofing Materials.—8,914, J. Beckman, Double Flush Tanks for Water-closets.—8 920, H. Lake, Metallic Lathing.—8,955, J. Kitchen, Sash Fastener. — 8,957, H. Rudge, Sash Fastener.—8,958, J. Galiott, Safety Device in Quadrant Sash Fasteners.—8,959, J. Dunba and J. Nichols, Window Sash Fasteners.

May 27.—8,965, T. Scragg, Potters' Clay Press Cloth.—8,971, J. Jones, Self-closing Doors.—9,007, W. Thompson, Panelled Articles, such as Doors, &c.—9,012, J. Noel, Chimney or Ventilator Tops.—9,020, H. Austie, Sash Fasteners.

May 28.—9,023, J. Shaw, Window Sash Fastener, &c. —9,039, W. Burnett and A. Rea, Door Handles.—9,044, G. Smith, Window Fasteners.

May 29.—9,090, A. Adcock, Sash-cord Pulley Brackets, &c.—9,107, G. Barnes, Connecting Union for Electric Light Fittings.

PROVISIONAL SPECIFICATIONS ACCEPTED.

5,127, J. Jose d'Alemeida and J. Ignacio Da Silva, Fire Indicating Apparatus.—6,770, D. Everitt and T. Claridge, Pigments.—6,833, J. Morley & Co, Flush-out Cisterns for Water-closets.—6,971, L. Lenegre, Safety Fastening for Doors.—7,077, H. Kine, Stay Bar for Casements, &c.—7,126, J. Kennard, Emergency Bolts for Doors of Theatres, &c.—7,465, G. Inkpen, Ventilation to Prevent Condensation of the Atmosphere on Shop-Windows.—7,812, M. Pinder, Ventilating Water-closets.—7,947, A. Pain, Gas-fitting.—8,600, F. and C. Roper, Dies for making Perforated Bricks.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

11,204, H. Lomax and W. Cotton, Fastening Doors, &c.—11,583, S. Hill and F. Lilley, Fastening Skylight, Windows, &c.—6,411, H. Baumotte, Chisels, &c.—7,031, G. Williams and T. Gregory, Sash and Sash-frames for Windows.—7,279, W. Withington, Disinfection of Water-closets.—7,486, J. Dehony, Window Ventilators.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MAY 28.—By *W. & F. Houghton:* "The Priory," Forest-rd., Walthamstow, and 19a. 0r. 19p., f., 5,600*l.*—By *Worsfold & Hayward* (at Dover): 3 and 4, Bowling Green-hill, Dover, f., r. 18*l.* 10s., 165*l.*; 199, London-rd., f., r. 25*l.*, 36*l.*; 61, East Cliff, f., 75*l.*; 275 to 278, London-rd., and "Susan's Villa," f., 1,560*l.*; "Claremont Cottage," Chapel-hill, f., r. 13*l.*, 165*l.*; 2 and 3, Victoria-st., f.g.r. 28*l.*, 315*l.*; 36, 37, and 38, Tower Hamlets-st., f., r. 39*l.*, 385*l.*; 4 and 5, Branch-st., f., r. 20*l.* 16s., 290*l.*; "The Gordon" café, Snargate-st., f., r. 60*l.*, increasing to 70*l.*, 900*l.*; a plot of land in Queen's-ct., f., 34*l.*

JUNE 1.—By *Hards & Bradly:* 86 and 88, Larkhall-ter., Clapham, u.t. 51 yrs., g.r. 14*l.* 590*l.*; 51, Salisbury-st., Bermondsey, f., r. 18*l.* 4s., 110*l.*; 30, Salisbury-pl., f., r. 20*l.* 16s., 160*l.*—By *Horne, Son, & Eversfield:* A rental of 80*l.* per annum, u.t. 30 yrs., Edwardes-sq., Kensington, 1,100*l.*—By *T. H. Wakefield:* 2, 4, 6, and 8, York-rd., Kings-cross, f., r. 345*l.*, 7,600*l.*; 12, 14, 16, and 18, York-rd, f., r. 200*l.*, 4,030*l.*; No. 21, Euston-rd., u.t. 15 yrs., g.r. 13*l.* 13s., r. 100*l.*, 770*l.*—By *E. & F. Swain:* 62, Holland-pk., Kensington, f., 5,100*l.*: 54, Holland-pk.-mews, f., 1,050*l.*—By *T. G. Wharton:* F.g.r. of 53*l.*, with reversion in 52 yrs., Auckland-rd., Clapham Junction, 1,320*l.*; F.g.r. of 19*l.*, with reversion in 80 yrs., Redan-st., &c., Hammersmith, 440*l.*; l.g.r. of 60*l.*, u.t. 85 yrs., g.r. 6*l.*, Crewys-rd., Peckham, 1,065*l.*

JUNE 2.—By *Newbon & Co.*: 10 to 24 (even) Roman-rd., Bethnal Green, u.t. 40 yrs., g.r. 25*l.* 4s., 1,710*l.*; 59, 60, and 61, Lessada-st., u.t. 40 yrs., g.r. 9*l.*, r. 80*l.* 12s., 480*l.*; 49, 50, and 51, Totty-st., u.t. 40 yrs., g.r. 9*l.*, r. 83*l.* 4s., 490*l.*; 41, Alma-st., Hoxton, u.t. 43 yrs., g.r. 5*l.*, 425*l.*; 72, Kynaston-rd., Stoke Newington, u.t. 73 yrs., g.r. 6*l.*, 230*l.*; 9, 11, and 13, Landfield-st., Clapton, u.t. 8 yrs., g.r. 8*l.* 10s., r. 93*l.* 12s., 180*l.*; Two plots of land in Chippendale-st., f., 100*l.*; 50, Fortess-rd., Kentish Town, u.t. 22 yrs., g.r. 13*l.*, r. 45*l.*, 230*l.*; 10, 43, and 49, Fenan-st., Bermondsey, u.t. 25 yrs., g.r. 8*l.* 10s., r. 44*l.* 10s., 250*l.*; 1a. 1, 2, and 3, Fort Cottages, Highbury, f., r. 65*l.*, 300*l.*—By *Physick & Lowe:* 44, Hillfield-rd., Hampstead, u.t. 81 yrs., g.r. 7*l.* 7s., 535*l.*; 24 and 26, Church-lane, f., r., 50*l.* 8s., 720*l.*; 6, Fordwych-rd., Brondesbury, u.t. 88 yrs., g.r. 8*l.*, r. 55*l.*, 585*l.*—By *Pratbrce & Morris:* 8, 10, 12, and 14, Amity-rd., West Ham, f., r. 83*l.* 4s., 725*l.*; 8 to 12, Gladstone-rd, Buckhurst-hill, f., r. 74*l.* 15s., 515*l.*; A Block of f. land, about 1 acre, Chelmsford-rd. East, Woodford, 520*l.*—By *Debenham, Tewson, & Co.*: "Apsley Cottage," Surrey, Banstead, and 8a. 2r. 6p., f., 2,350*l.*—By *Ball, Norris, & Hadley:* 47, 49, and 51, Great Church-lane, Hammersmith, u.t. 65 yrs., g.r. 9*l.* r. 93*l.* 12s., 650*l.*; 9, 11, 13, and 15, Galena-rd., u.t. 73 yrs, g r. 7*l.*, r. 109*l.* 4s., 700*l.*; 148, King-st., u.t. 63 yrs., g.r. 52*l.*, r. 66*l.*, 185*l.*; 102, King-st., and 1 & 2, Dimes-pl., u.t. 74 yrs., g.r. 25*l.*, r. 105*l.* 4s., 1,100*l.*; F.g.r. of 10*l.* a year, Baruet Villas, Barnes, 225*l.*—By *J. M. Klenck & Co.*: 16 to 21, Cotton's-gardens, Shoreditch, f.r. 68*l.* 6s., 410*l.*—By *Seagrave & Taylor:* 27, Gilbert-rd., Kennington, u.t. 26 yrs, g.r. 4*l.*, r. 38*l.*, 265*l.*; 3, 5, 7, & 9, Durham-st., u.t. 16 yrs., g.r. 11*l.*, r. 104*l.*, 725*l.*—By *J. A. & W. Tharp:* 58 and 60, Union-rd., Stratford, f., r. 31*l.* 4s., 382*l.*; 70, Union-rd., f., r. 20*l.* 16s., 185*l.*; 1 and 2, Barclay-ter, Leytonstone, u.t. 57 yrs., g.r. 6*l.* 10s., r. 40*l.*, 110*l.*

JUNE 3.—By *J. H. Hunter:* "The Black Prince" public-house, Princes-rd., Kennington, f., 5,500*l.*; No. 166, Haverstock-hill, u.t., 59 yrs., g.r. 15*l.*, 760*l.*—By *Edwin Smith & Co.*: 38 and 40, Camberwell-grove, Camberwell, f., r. 65*l.*, 930*l.*; a peppercorn ground-rent secured on thirty-one houses in Parkham-st., with reversion in 75 yrs, Battersea, 340*l.*; 1 to 12, Gaines-cottages, and 37 to 45 (odd), Sheepcote-lane, f., r. 213*l.* 4s., 1,985*l.*—By *Rushworth & Stevens:* 47, Tenter-st. South, and 51, Great Prescott-st., Aldgate, f., r. 151*l.* 15s., 1,300*l.*—By *Buckland & Sons:* "Little Lowbrooks Farm," containing 64a 0r. 5p., f., Bray, Berks, 3,500*l.*—By *F. Jolly & Co*: 46 and 48, Edward's-rd., Mile-end, u.t. 46 yrs., g.r. 9*l.*, r. 52*l.*, 250*l.*; "Melrose," Overhill-rd., Dulwich, f., r. 60*l.*, 950*l.*

JUNE 4.—By *H. Oughton & Son:* 5 and 6, Markham-st., Chelsea, u.t. 28 yrs., g.r. 8*l.*, r. 68*l.*, 590*l.*; 7, Blenheim-st., u.t. 17 yrs., g.r. 4*l.*, r. 42*l.* 4s., 180*l.*; 4, Tite-st., u.t. 61 yrs., g.r. 10*l.*, r. 70*l.*, 760*l.*; 125, Church-st., u.t. 11 yrs., g.r. 8*l.* 8s., 310*l.*; 129 Church-st., u.t. 11 yrs., g.r. 8*l.* 8s., 216*l.*; 22 and 24, Upper Cheyne-row, u.t. 44 yrs., g.r. 5*l.*, r. 57*l.* 4s., 390*l.*; 65, Christchurch-st., u.t. 50 yrs., g.r. 10s., r. 22*l.*, 140*l.*; 1, 2, and 3, Christchurch-ter., u.t. 60 yrs., g.r. 5*l.* 15s., 1,110*l.*; 299, King's-rd., and a g.r. of 31*l.* 15s., u.t. 47 yrs., g.r. 29*l.*, 560*l.*; 28, Queen's rd., West, u.t. 3 yrs., g.r. 6*l.* 6s., r. 65*l.*, 95*l.*; The residence, "Cedar House," Glebe-pl., u.t. 67 yrs., g.r. 10*l.*, r. 70*l.*, 950*l.*; 26 and 28, Elizabeth-st., Pimlico, u.t. 39 yrs., g.r. 14*l.*, r. 93*l.*, 860*l.*; 57, Westbourne-st., u.t. 30 yrs., g.r. 6*l.*, r. 32*l.*, 375*l.*; 5, Thurloe-pl., South Kensington, u.t. 15 yrs., g.r. 8*l.*, 610*l.*—By *Ridley, Ledger, & Hollis:* 47 to 57 (odd), Woodstock-rd., Chiswick, u.t. 89 yrs., g.r. 41*l.*, 1,145*l.*; 1, 2, 3, 4, 5, and 7, Blandford-rd., u.t. 89 yrs., g.r. 50*l.* 8s., r. 204*l.*, 1,455*l.*; 6 and 8, Marlborough-rd., u.t. 83 yrs., g.r. 18*l.*, r. 72*l.*, 530*l.*; 6 and 8, Marlborough-cres., u.t. 83 yrs., g.r. 21*l.*, 310*l.*; 39, The Av., u.t. 83 yrs., g.r. 15*l.*, r. 57*l.* 10s., 630*l.*—By *Newbon & Co*: "The Poplars," with stabling Castle Bar-hill, Ealing, f., 2,500*l.*; 30, Highbury-grove, Highbury, u.t. 59 yrs., g.r. 10*l.* 5s., r. 100*l.*, 1,240*l.*; 411, Caledonian-rd., Islington, u.t. 56 yrs., g.r. 8*l.*, r. 48*l.*, 365*l.*; 115 and 117, Grove-rd., Holloway, u.t. 72 yrs., g.r. 16*l.*, r. 100*l.*, 870*l.*—By *A. & A. Field:* 47 to 53 (odd), Fuller-st., Bethnal-green, f., r. 101*l.*, 1,100*l.*; 14, Bergerrd., Hackney, f., r. 36*l.*, 315*l.*; 166 to 180, Stepney-green, Steyney, u.t. 15 yrs., g.r. 150*l.*, r. 299*l.* 2s., 320*l.*; 43, Studley-rd., Clapham, u.t. 46 yrs., g.r. 5*l.*, r. 42*l.*, 360*l.*—By *W. A. Blakemore:* "Torrington Lodge" Claygate, Surrey, and 7a. 3r. 3p., f., 1,850*l.*; 22 and 24, Choumert-grove, Peckham, u.t. 65 yrs., g.r. 6*l.*, r. 59*l.* 16s., 355*l.*—By *W. W. Jenkinson:* f.g.r. of 37*l.*, with reversion in 65 yrs., Ct. Hill-rd., Lewisham, 920*l.*; 5, Bankbuildings, Wimbledon, u.t. 93 yrs., g.r. 22*l.*, r. 100*l.*, 1,390*l.*

JUNE 5.—By *G. A. Wilkinson:* "The Sisters," and 8¾ acres, Clapham Common, 32,550*l.*; "The Hollies," Broxbourne, Herts, and 5a. 2r. 29p., f., r. 13*l.*, 4,100*l.*; "Walton Lodge" and Grounds, f., r. 60*l.*, 1,20 *l.*; "Vine Cottage," Chigwell, Essex, f., r. 42*l.*, 600*l.*—By *Baker & Sons:* Freehold Building Estate, 10¾ acres, Cambine Town, 4,000*l.*—By *J. C. Platt:* 9, Askew-rd, Shepherd's Bush, u.t. 52 yrs., g.r. 8*l.*, 290*l.*; 10, Clarendon-ter., Maida Vale, u.t. 57 yrs., g.r. 4*l.* 15s., r. 40*l.*, 450*l.*—By *W. C. Heron:* The Residence, "Springwell Pk.," f. and part c., Hayes, Middlesex, 325*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; f.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/0/0	9/0/0
Teak, E.I.. load	8/10/0	14/0/0
Sequoia, U.S.ft.cu.	2/3	3/0
Ash, Canada load	2/10/0	4/5/0
Birch, do.	2/5/0	3/15/0
Elm, do.	3/10/0	4/15/0
Fir, Dantzic, &c.	2/0/0	3/15/0
Oak, do.	2/10/0	4/10/0
Canada.....	4/17/6	6/10/0
Pine, Canada red	2/10/0	3/10/0
Pine, Yellow ...	2/0/0	5/10/0
Lath, D'nitic, fath	5/0/0	8/0/0
St. Petersburg	5/0/0	7/0/0
Deals, Finland,		
2nd & 1st std 100	7/15/0	10/10/0
Do. 4th & 3rd ..	7/5/0	8/5/0
Do. Riga	6/5/0	7/15/0
St. Petersburg,		
1st yellow ..	9/15/0	14/10/0
Do. 2nd yellow	8/5/0	9/5/0
Do. white	6/15/0	10/10/0
Swedish	6.15/0	15/15/0
White Sea	8/5/0	17/5/0
Canada, Pine1st	13/0/0	24/0/0
Do. do. 2nd....	9/0/0	15/10/0
Do. do. 3rd, &c.	6/10/0	10/0/0
Do. Spruce. 1st	8/15/0	11/0/0
Do. do. 3rd & 2nd..	6/5/0	7/15/0
New Brunswick	5/5/0	7/5/0
Battens, all kinds	3/10/0	15/10/0
Flooring Boards, sq. 1 in. prep.		
1st	0/10/0	0/14/0
Do. 2nd	0/9/0	0/10/0
Other qualities	0/6/0	0/7/6
Cedar, Cuba ..ft.	/4	/4½
Honduras, &c.	/4	/4½
Mahogany, Cuba.	/4½	/6½
St. Domingo, cargo av	/4½	/6½
Mexican do. do	/5½	/6½
Tobasco do. do	/5½	/7
Honduras do..	/5½	/6½
Box, Turkey ton	4/0/0	18/0/0
Rose, Rio.....	10/0/0	20/0/0
Bahia	9/0/0	18/0/0

TIMBER (*continued*).		
Satin, St. Domingo .....ft.	0/0/10	0/1/3
Porto Rico	0/0/10	0/1/6
Walnut, Italian..	0/0/3½	0/0/7
METALS.		
IRON—Bar, Welsh, in London.. ton	6/5/0	6/15/0
Do. do. at works	5/15/0	6/5/0
Do. Staffordshire, in London	6/5/0	7/0/0
COPPER—British, cake and ingot	56/0/0	57/0/0
Best selected ..	59/0/0	60/0/0
Sheets, strong..	68/0/0	0/0/0
Chili, bars	52/10/0	0/0/0
YELLOW METAL..	0/0/6	0/0/6½
LEAD — Pigs, Spanish.....ton	12/13/0	12/15/0
English, com. brands	12/5/0	12/17/6
Sheet, English, 3 lbs. per sq. ft. and upwards ..	14/5/0	0/0/0
Pipe	14/15/0	0/0/0
ZINC — English sheet .....ton	26/5/0	0/0/0
Vieille Montagne.....	26/15/0	0/0/0
TIN—Straits	90/10/0	0/0/0
Australian	90/15/0	0/0/0
English Ingots	94/10/0	0/0/0
OILS.		
Linseed ..... ton	21 7 6	22 5 0
Cocoanut, Cochin	34 10 0	0 0 0
Do. Ceylon	29 10/0	0 0 0
Palm, Lagos	25/10/0	0 0 0
Rapeseed, English pale	30/10/0	0/0/0
Do. brown	29/0/0	0 0 0
Cottonseed ref...	21/0/0	0 0 0
Olive	31/15/0	34 0 0
Lubricating, U.S.	0/0/0	6 0 0
Do. refined	8/0/0	12/0/0
TAR—Stockholm barrel	0/19/6	1/0/0
Archangel	0/18/0	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ARDLEIGH.—For the erection of a farm house, pair of cottages, farm buildings, and reparations at "Water House Farm," for Mr. W. R. Auston. Mr. J. W. Start, R.I.B.A., architect, Cups Chambers, Colchester. Quantities by architect.

A. Dias	£1,546	0	0
W. & H. Lawton. .	1,438	0	0
G. Bilsby	1,429	10	0
T. J. Ward	1,477	0	0

F. Dupont	£1,435	0	0
H. Everitt & Son .	1,394	0	0
H. Beaumont ...	1,295	0	0
W. Fenn, Ardleigh*	1 140	0	0

* Accepted.

BARGOED (Mon.).—For the erection of a house, at Bargoed, Messrs. Aaron Davies & Son, architects, Pontlottyn :—

T. Davies	£330	0	0
	£324	0	0

Dan. Edwards, Bargoed* .. £284

* Accepted

BECKENHAM.—For the erection of private house with shop and offices, dairy and stabling, &c., at Beckenham, for Mr John Broomfield. Mr. J. P. Chost, architect, 98, The Grove, Camberwell, S.E :

Wallsch	£1,885		
Syme & Duncan	1 671		
Whitehead & Co	1,699		
Wheeler & Co..	1,650		

Bowyer	£1,626		
Graham	1,610		
Jones	1,447		
A. W. Garner, Peckham.*	1,425		

* Accepted subject to detailed estimates.

BRIGHTON.—For painting, &c., the Warren Farm School, Brighton, for the Guardians

V. P. Freeman	£928	0	0
H. J. Trussell	720	0	0
J. J. & Saunders	405	0	0
Barber & Oliver, Jubilee-street, Brighton*	387	0	0

* Accepted subject to approval of surety.

BURTON-UPON-TRENT.—For the alteration and extension of Girls School, Goodman-street, for the School Board. Mr Reginald Churchill, architect, St. Paul's square, Burton-upon Trent. Quantities by architect :—

Mason & Sons	£994	0	0
Chamberlain Bros .	955	0	0
J. Lowe & Son ...	955	0	0
H. Vernon	949	0	0

Harris	£847	15	10
G. Hodges	947	0	0
Wilkes & Slater, Derby accepted) ..	893	0	0

CAMBRIDGE.—For the erection of a residence, Huntingdon-road, Cambridge, for C. H. Payne, architect, Cambridge :—

Pamphion Bros.	£1,579	0	0
Coulson & Lofts	1,398	0	0
Willmott & Sons	1,179	0	0
Ripper	1,125	0	0
Bangard	1 095	0	0

Reddig & Son.....	£1,079	0	0
A. Bunting	1 015	0	0
Prime & Sons, Cam. bridge (accepted ..	1,080	0	0
A. Hicks	993	15	0

CAMBRIDGE.—For the erection of two villas, Chesterton-road, Cambridge. Mr. C. H. Payne, architect, Cambridge. Quantities by the architect :—

Kerridge & Shaw.....	£1 870		
Reddig & Son.....	1 8 5		

Willmott & Sons..	£1,750		
Bridge (accepted).....	1,750		

CAMBRIDGE.—For the erection of a house, Chesterton-road, Cambridge. Mr. C. H. Payne, architect, Cambridge. Quantities by the architect :—

Prime & Sons	£575		
Willmott & Sons....	485		
Ripper	478		

Reddig & Son.....	£470		
Coulson & Lofts (accepted).	465		
Nicholas Bros.....	465		

[All of Cambridge.]

CARLISLE.—Accepted for the erection of two houses at Scotland-road, Stanwix, for Mr. T. Ridley. Mr. Geo. Armstrong, architect, 64, Lowther-street, Carlisle. Quantities by architect :—

Mason and Bricklayer—Gilbert Hill, Carlisle	£402	0	0
Carpenter and Joiner—Joseph Bell, Stanwix	240	0	0
Slating—G. Irving, Stanwix	72	0	0
Plumbing—W. Anderson, Carlisle	89	3	10
Plastering—R. M. Oliver & Son, Carlisle	145	0	0
Painter and Glazier—W. Laidlow, Stanwix.....	50	0	0

CHINGFORD.—For alterations, &c., at the "Prince Albert" public-house, Chingford, Essex. Mr. F. A. Ashton, architect

H. Whitty	£1,981	S. W. Hawkins ...	£1,559
J. Lizzel	1,778	J. Hibbert	1,599
W. Shrimpton	1,699	F. Vyse	1,595
F. J. Nicholls.....	1,645	Heath & Farrow....	1,478

COLD ASH (Berks).—For the erection of a new hospital building to the Home for Sick Children, at Cold Ash. Mr. James H. Money, Speenhamland, architect :—

W. Dixon	£1,102	12	0
W. Marshall... ...	999	3	0
G. Elms	943	0	0

E. Jones & Son, Newbury*	£944	0	0

* Accepted conditionally.

EAST GRINSTEAD.—For the erection of a Constitutional Club at East Grinstead, Sussex. Mr. Paul B. Chambers, architect, Ship-street-chambers, Brighton :—

Pledge	£2,170	A. Foster, East Grinstead	
Luxford	1,699	(accepted)	£1,495

EAST GRINSTEAD.—For alterations and additions at Brook House, East Grinstead, for Mr G S Head. Mr. Paul B. Chambers, architect, Ship-street-chambers, Brighton :—

Pledge (accepted)	£1,034 0 0
Additions to Stables	
Pledge (accepted)	£107 0 0

FOREST GATE.—For the erection and completion of four houses at Forest Gate, for Mr. W. J. Cook. Mr. Charles F. Burden, surveyor, East Ham :—

W. Gladding	£2,187	Crisp	£1,443
Hoskings	1,847	M. Gibson & Co.	1,270
Boulter	1,46[illegible]	Geo. Barker (accepted)	1,250

LEEDS.—Accepted on schedule of prices for alterations, &c., "Bull and Bell" Hotel, Leeds. Messrs. Swale & Mitchell, architects, Leeds :—

Mason, Brick and Concreters' Work—Cross & Carter, Bowman-lane, Leeds.
Carpenters and Joiners—Cross & Carter.
Plumbers and Glaziers H. Braithwaite & Co., Swinegate, Leeds.
Plasterer—T. Moore, Benson-street, Leeds.
Slater—James Season, Bunshaw-road, Leeds.
Painter and Decorator—Arthur Butler, Mill-street, Leeds.
Gas fitting—T. Thomson & Co., Cross-street, Manchester.
Electric Bells—Alfd. Dangerfield, 68 Georges-street, Leeds.
Tiling—G. Woolcroft & Son, Hunslet.

LEEK.—Accepted for erecting a house in Destry-street, Leek, for Mr. R. H. Shewell. Messrs. W. Sugden & Son, architects, Leek. Quantities by the architects :—

Cornelius Cornes (contracts 1 and 2)	£1,650 0 0		
Edwin Phillips (contract 3)	181 15 9		

LITTLE BURSTEAD (Essex).—For the erection of a National School, to accommodate sixty-six children, for the Rev. H. J. Bodily, M.A. Messrs. J. T. Newman & Jacques, architects, 2, Fenchurch-street, E.C. :—

Letch	£520 0 0	Ansell, Billericay*	£493 0 0
Bruty	478 10 0		
		* Accepted	

LONDON.—For certain painting, whitewashing, cleaning, &c., at the St. George's Union Infirmary, Fulham-road, S.W., for the Guardians of the St. George's Union. Mr. H. Saxon Snell, architect :—

A. Cooper & Son	£826	W. & E. Mills	£[illegible]3
Edward Howard	674	T. J. Thompson	347
Flew & Co.	560	W. G. Lilly, Pall Mall E.*	334 [illegible]
		* Accepted.	

LONDON.—For the erection of stables, Thomas-street, Whitechapel, E. Messrs. Hammack & Lambert, architects :—

Vear	£1,275	Beadle & Farrow	£1,048
Wood	1,191	Goodall	980

LONDON.—For rebuilding the "Morgan Arms," Coborn-road, Mile End, E. Messrs. Hammack & Lambert, architects :—

Drew & Cadman	£4,296	Putman & Fletcher, Limited	£3,621
Down	3,777	Cox	3,382
Hearle & Farrow	3,660	Addy & Sons	3,342
Shurmur	3,654	F. & F. J. Wood	3,337

LONDON.—For internal alterations and repairs at the "Crown and Anchor" public-house, Cranbrook-street, Bethnal Green, E., for Mr. C. A. Berg. Mr. Fred. A. Aslett, C.E. (late Isaacs), architect :—

J. & F. Bane	£476	C. Wills	£440
J. & H. Cooke	430	S. W. Rawlings	415
Conrad Bros.	427	P. Russell	380
H. Whitty	395	J. Foster (accepted)	368

LONDON.—For proposed new stables, &c., at Upper East-Smithfield, E., for Mr. Henry Vile. Mr. Edgar A. Hasson, architect, 47, Mark-lane, E.C. Quantities by Mr. Frederick Downing, 7a, Whitehall-yard, S.W. :—

	Time in weeks.
Hearle & Farrow	£9,740 0 0 — 24
Ashby & Horner	9,250 0 0 — —
Woodward & Co.	9,190 0 0 — 28
Patman & Fotheringham	9,168 0 0 — 24
W. & H. Castle	9,118 0 0 — 40
Outhwaite & Son	8,984 0 0 — —
Grover & Son	8,928 0 0 — 23
Gill Bros.	8,825 7 8 — 24
John Sparks (accepted)	8,8[illegible] 0 0 — 25

LONDON.—For making up the following roads for the Vestry of the parish of Fulham. Mr. W. Sykes, New-streets Surveyor :—

Name of Contractor	Gironde-road.				Rosaline-road.				Tournay road, [illegible] H.			
	R.	Y.	V.	I.*	R.	Y.	V.	I.	R.	Y.	V.	I.
	£	£	£	£	£	£	£	£	£	£	£	£
Nowell & Robson	440	190			2[illegible]	125			61	28	15	
T. Adams	476	206	18	170	2[illegible]	142	15	14	61	30	0	27
G. Bell	493				161							
Toones & Wrigley	201	194	184	17[illegible]	166	138	127	123	57	24	0	24
J. Mears	672				241							
Imperial Stone Co.					148							
H. J. Greenham	389	225	220	205	1[illegible]	147	145	135				

R.—All work except the actual paving. Y.—York stone paving.
V.—Victoria stone paving. I.—Imperial stone paving.

LONDON.—For the erection of Freemasons' Girls' School, to accommodate 1[illegible]8 children, on the Caterham's Lane Surrey centre, for the West Kent School Board. Messrs. J. T. Newman & Jacques, Architects to the Board, 2 Fenchurch-st., E.C. Quantities by Messrs. R. L. Curtis & Son.

Hearle	£18,674	Reed	£18,955
Catley	18,303	Sharpe	18,[illegible]3
Maddison	17,[illegible]2	Mowlem	17,[illegible]7
Hocking	18,17[illegible]	Shillibeer & Co.*	17,430
* Accepted subject to the approval of the Education Department.			

LONDON.—For alterations, &c., to the "Northumberland Arms" public-house, Bark-house-road, Plaistow, E. Mr. Robert Dixon, architect :—

Wilkinson Bros.	£2,484	Whitehead	£2,[illegible]9
J. Smith & Son	2,[illegible]7	W. Smith	2,[illegible]2
Holliday & Greenwood	2,[illegible]5	Walls Bros.	2,078
J. Beale	2,[illegible]4	W. Shurmur	2,088
Williams	2,[illegible]7	J. Holland	2,045

LONDON.—For alterations and repairs, Hamilton-terrace, St. John's-wood. Mr. J. H. Ashton, Hillcot, Lee and Co., Warwick-street, E.C. :—

Godfrey & Son	£[illegible]7	Screwin Bros. & Co.	£247
Hayworth	222	Britten	212

LONDON.—For alterations and new mahogany front to the "Sir John Falstaff" public-house, Cullum-street, Strand. Mr. A. L. Bower. Messrs. George & W. Ralph Low, architects :—

Holliday & Greenwood	£[illegible]7	H. Bolton, Albert-West End	
Lister	240	Lee, Kilburn*	£215
		* Accepted.	

LONDON.—For rebuilding No. 224, High-road, Kilburn, after fire, for Mr. W. Roper. Mr. R. D. Hanson, architect :—

H. B. Oldrey, West End-lane, Kilburn (accepted)	£687 0 0		

LONDON.—Accepted for sanitary alterations at 28, Berkeley-square, for the Duke of Somerset. Mr. W. D. Scott Moncrieff, engineer :—

The North British Plumbing and Scientific Sanitation Company, 86, Newman-street, Oxford-street	£475 0 0
[No competition.]	

LONDON.—For alterations and decorations at 15, Alexander-street. Messrs. Flood & Sons, surveyors :—

R. A. Anderson	£129 10	W. Langridge & Sons*	£107 15
Gibbon & Sons	118 13	* Accepted.	

LONDON.—For the erection of houses Shepherd's Bush, W. Mr. J. H. Richardson, architect, Shepherd's Bush. Quantities by Mr. H. Lovegrove :—

Lundy (accepted)	£748 15 0		

LONDON.—For the erection of wharf wall. Messrs. Hudson & Booth, architects. Quantities by Mr. H. Lovegrove :—

Mowlem & Sons	£1,949	Hill, Bothill & Co.	£1,425
E. Lawrence & Sons	1,889	Wall Bros.	1,225
Cubitt & Sons	1,857	F. & H. F. Higgs*	1,180
Jas. Greenwood & Sons	1,758	* Accepted.	

LONDON.—For the remainder of the mahogany bar fittings, enamelled iron ceiling, &c., at "The Mansfield" Hotel, Gospel Oak, for Mr. J. T. Davies. Mr. Albert E. Pridmore, architect, 2, Broad-street-buildings, E.C. Quantities by Mr. Alfred Griggs :—

Lundy & Co., Shepherd's-bush*	£1,252 0 0		
* Accepted exclusive of party walls and shop fronts.			

NORTH WALSHAM.—For new class-room and lobby for the Girls' School, North Walsham, for the School Board. Messrs. Bottle & Olley, architects, 34, Regent-street, Great Yarmouth :—

G. H. Easto	£365 0	W. Wilson	£297 10
R. Easto	340 0		

PORTSEA.—For external fire-escape staircases and other works at the Union-house, Portsea, for the Portsea Island Board of Guardians. Mr. Chas. W. Bevis, architect, Southsea :—

H. Jones	£3,580	W. Ward	£3,251
D. W. Lewis	3,500	W. Learmouth	3,294
T. P. Hall	3,488	E. & A. Sparrings, Portsmouth (accepted)	3,250
J. Crockerell	3,387		

PORTSEA.—For erecting new meat-house at the Union-house, Portsea, for the Portsea Island Board of Guardians. Mr. Chas. W. Bevis, architect, Southsea :—

D. W. Lewis	£460 0	J. Crockerell	£370 0
W. Ward	449 0	E. & A. Sparrings	370 0
H. Jones	429 0	W. Learmouth, Portsmouth (accepted)	339 3
T. P. Hall	407 0		

SWINDON.—For the erection of the Gorse-hill School, for the Swindon School Board. Messrs. William Drew & Son, architects, Swindon. Quantities by the architects :—

W. Chalders	£10,210 10 0	A. Coe	£7,787 18 2
H. Hewelling	9,103 1 0	T. Barrett	8,724 8 0
Stephens, Bastow, & Co.	8,884 0 0	G. Wiltshire	8,6[illegible] 0 0
		Williams	8,366 2 2
J. Hunt	8,[illegible]2 0 0	T. Banks Lyndon, Limited*	7,471 0 0
		* Accepted.	

SWINDON.—For erecting a dwelling-house and school in the Victoria-road. Messrs. W. Drew & Son, architects :—

G. Wiltshire	£1,040 15 0	T. Barrett	£1,019 14 6
C. Williams	1,030 0 0	[All of Swindon.	

UPTON PARK.—For alterations and additions at the "Duke of Edinburgh" public-house, at Upton Park, E., for Mr. W. Langman. Mr. Fred. A. Ashton, architect, Oxford, E. :—

J. & H. Cocks	£2,957	W. Shurmur	£1,791
J. Baxter	2,060	Colwell Bros.	1,783
Hearle & Farrow	2,001	W. Watson	1,675
Walker Bros.	1,960		

WANSTEAD (Essex).—For the erection of stabling at Evergreen Lodge, Wanstead, Essex, for Mr. J. E. Cockett. Mr. Herbert Rogers, architect, 59 and 60, Cornhill, London, E.C. Quantities supplied :—

J. Jolliffe	£425 0	T. Osborn & Sons	£399 10
Coulsell Bros.	394 0	W. Mundy	378 0

WAVERTREE.—Accepted for the completion of certain streets and passages, for the Wavertree Local Board. Mr. Isaac Dixon, Surveyor, Town-hall, Wavertree, Liverpool :—

Thos. Catterall & Co., Phœbe Ann-street, Liverpool	£1,242 1 6		

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The Builder.

VOL. LX. No. 2324 SATURDAY, JUNE 20, 1891.

ILLUSTRATIONS.

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Proposed New Bell-Tower, St. Michael's, Coventry.—Messrs. Paley & Austin, Architects ..... *Two Single-Page Photo-Litho's.*

Accepted Design for the London County Council's Municipal Lodging-House for Men.—Messrs. Gibson & Russell, Architects ..... *Two Double-Page Photo-Litho's.*

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Bookbindings at the Burlington Club.

THE collection of bindings now on view at the Burlington Fine Arts Club forms one of the artistic events of the season, and not one of the least interesting; indeed, as far as general visitors are concerned, it seems to be a good deal more attractive than some of the collections of water-colours, engravings, and etchings which have been seen at the Club from time to time. This is perhaps partly because bookbindings are a class of work largely sought after by those who are called collectors, and who naturally cluster round an exhibition of the objects of their own particular fancy. Our interest in the exhibition is rather from the artistic than the collector's point of view. The collector too often developes an exceedingly artificial taste in regard to work of this kind, valuing a binding according to its rarity or its specially typical illustration of the work of a certain artificer or a certain period. It is the business of the art-critic to put aside this conventional standard, and consider such a collection as an illustration of the extent and nature of the design which has been applied to the backs of books.

The collection is said to be still incomplete; it is quite certain that the catalogue, inconveniently sumptuous as it is in size and margin, is very incomplete indeed. The books are conveniently arranged in cases marked by letters of the alphabet, the examples in each being numbered separately; but several of the cases are entirely omitted from the catalogue as it at present stands. We may take the collection, however, as a tolerably representative illustration of the principal types of design which have been used in bindings, and on the whole it can hardly be said that in this sense it tends to raise our ideas as to the scope and variety of the art, considering the long time it has been practised. Mr. Prideaux, at the close of his prefatory essay attached to the catalogue, laments the want of invention in modern binding. "Binding," he observes, "can never again become a fine art unless invention goes hand-in-hand with the execution which now leaves nothing to be desired. In other departments of decorative art we see the same inability to escape from the traditions of the past, but in none has there been such servile copying of the old models as in the decoration of books." Not even in stained glass, for instance? While it is true, however, that modern æsthetic binding seems very much confined to the imitation of old types, one cannot but observe, in looking at the old examples, how exceedingly few in number are the recognisable types, how little variety of artistic invention has been applied during two or three centuries to this very largely-used class of object. As to the principle of application of design, bindings may be broadly divided into those which accentuate certain portions of the cover, such as the edges, centre, or angles, and those which spread a decoration over the whole superficies of the book. Innumerable forms might be designed on either of these principles, of course; but of the collection at the Burlington one can hardly recognise more than four different ideals of design. There is the old-fashioned binding produced by square stamps, generally applied so as to form panels and bands arranged in parallelogram fashion. There is (by far the largest type) that in which the main feature in the design consists of interlacing strap work, usually accompanied by floral ornaments which twine in and out of the strap lines; there is the powdered or diaper design, consisting of the repetition of a small feature all over the back, just confined by a narrow border round the edges; and there is the ornamental edge border of repeated figures with the angles accentuated by little incidental designs fitted into them. There are rich variations in detail in some of these types, but the repetition of ideas and the paucity of invention is remarkable. Occasionally we meet with an exceptional example in which there is some special invention and freedom of design, but in a general way it must be felt that the art of the bookbinder has moved on rather narrow and conventional lines.

Of the early class of stamped bindings without gilding there are two cases, English and Foreign, the majority of the sixteenth century, but a few going back to the thirteenth and twelfth centuries. Of these the oldest is the Winchester Domesday book, "Liber de Terris Regis Reddentibus Langabalum et Brugium in Winton," lent by the Society of Antiquaries. This specimen aptly illustrates the special feature of the stamped binding, in which the decoration is formed by a stamp impressed successively on different portions of the cover. Here there is in the centre a double impression of a large coarse circular stamp, forming two circles one above the other within a border. With the smaller square stamps wide bands were formed by the successive impression of the stamp along lines parallel with the edges of the cover, the slight inequality and irregularity due to the shifting of the stamp having rather a good than a bad effect, giving a little play to the lines and texture to the surface, the opposite of mechanical hardness and correctness of execution. This is well illustrated in the example No. 10, case A, from the Durham Cathedral Library, in which the stamps form a succession of small square panels with a decorative design in them. In later days stamped ornaments were produced by circular stamps made to roll over the leather, thus securing continuity of repetition and saving of time, with the loss of the picturesque texture of the old square-stamped covers. Dingy-looking these old ungilded tomes are, but they present much interesting detail when studied, and their heavily-ridged backs have a monumental appearance which adds a kind of impressiveness to them. Among the foreign examples in case B, the binding of the "Horæ Beatæ Mariæ Virginis," by Bloc of Bruges (1520), shows a panel stamp with figures of animals. Among the German examples in this case are two interesting buckskin bindings, 40 and 41, the first with portraits of Luther and Melanchthon in panels, and a delicate little leaf border round it.

Case C contains some Oriental bindings, of which we may observe, what is the case perhaps in no other class of work exhibited, that the modern bindings are as fine as the old, or finer. In fact, the majority of these are of the seventeenth, eighteenth, and nineteenth centuries, and the latter are the richest and most effective. The outside and inside covers of the "Gulistan of Shek Muslihúd-din," bound by Abdul Rahman, hereditary binder to the Court of Delhi (1860)

is a rich and sumptuous example of gold arabesques, leaving at intervals the blue ground in the shape of an irregular panel; and the outside cover of the Koran, in the same style and by the same artist, is even finer. Among the specimens in this case is a curious Persian lacquer binding, belonging to the early part of this century, representing the court of Fath Ali Shah, a composition in a flat decorative manner with a number of figures.

In case D, in which we come to tooled bindings, is a remarkable example, "St. Augustini de Civitate Dei," lent by Mr. Alfred Huth. It is covered with gilding, with a bold design in strap-work intertwined, the pattern filled in with red. In case F is another peculiarly fine strap-work design, French; "Lazius de Gentium" (1557); the strap-work is on a dark ground, and the inner side of it defined by double lines, a beautifully-refined scroll-work foliage design meanders around and twines through the strap-work. This is lent by Earl Spencer, and is described as "bound for Grolier." Another Grolier binding of somewhat marked character is No. 8, case F, a Cicero. The strap-work takes a bold form covering the whole back, a kind of diamond with ogee sides and foliated at the points; within this are two triangles crossed; around the edge is a marginal ornament formed by linked hexagons. This is an Italian binding of the early sixteenth century, and is noticeable as treating the ordinary elements of this class of design with a good deal of individuality; it is dated 1485 and belongs to the Queen. Another striking design of the strap class in this case is Mr. Toovey's copy of Poliphilo (No. 24), the straps here are unusually broad in proportion and free and flowing in line; they are inlaid with different colours; gilt flowers twine through them in the usual way. This is a Venetian binding of the date 1545. In case G another Italian binding of the sixteenth century strikes one as very effective, though of very simple elements; this is Earl Spencer's "Psalterium" (1513), with four fine cameo heads near each angle of the cover; the remaining surface is covered with a small powdering formed of triple and quadruple assortments of dots alternately. It was felt perhaps that the diaper ornament should be such as not to interfere with the interest of the cameos.

The large case, I, at the top of the room, contains a number of fine specimens of French binding of the sixteenth and seventeenth centuries. An interesting object among these is a copy of Alberti's "Art de Bâtir," in very handsome binding with the monogram of Henri II. and Diana of Poitiers. This case illustrates some special classes of bindings, especially that in which the ornament consists simply of a powdering of some small repeated design over the surface, with a bounding line round the edges. There are several fine and large-size specimens of this type of binding, (Nos. 14, 47, 49, 59, 60*a*, &c.) in which any kind of object seems to be accepted for the powdering—a monogram, or flower, or dolphin; the latter, which occurs in two examples, of course referring to the Dauphin of France. It cannot be denied that the decorative effect of these powdered bindings is good, especially on a large book, though the thought that goes to making them is about as little as may be. Other means of producing this "all-over" decoration are illustrated in No. 21 I, where the space is divided by crossing lines into diamonds alternately filled with the owner's monogram and two triangles crossed; a better example is the Plautus, No. 36 I, covered with small oval divisions each with a floweret in them. An important example is the binding by Le Gascon, No. 61 (seventeenth century), as this furnishes a rich example of a type which is being largely imitated in modern days. It consists of a large or ruling pattern executed in strap-work in which convex and concave curves are combined in such a manner as to leave irregular open spaces between, with the same opposition of curves; the spaces are then filled with very delicate tooled scroll ornament. The treatment of the curves in the principal design produces a happy effect, relieving the design from formal symmetry; J. Zaehnsdorff's binding, No. 41 in case Q, is obviously based on this class of French work, or rather is a direct imitation of it. Case I also illustrates the fancy for binding in plain red morocco with no ornament whatever; a taste apparently devoted especially to small editions of the classics. We find also among the seventeenth-century French books specimens of the border decoration only, which in modern days, at the earlier part of the century, became so prevalent in English designs.

In the English bindings of the seventeenth century in case M we first find a marked tendency to emphasise the angles of the cover, as in Nos. 4, 5, and 7, the latter a white vellum binding with a rich radiating ornament in the angles, and the remainder of the space powdered, with the arms of James I. in the centre. Two Aristotles, Nos. 14 and 15, show again strongly accentuated angle treatment. A small narrow volume of the Psalms (26) is a very artistic example, with narrow strap-work dividing it into panels completely filled with small floral decoration. Nos. 34, 35, 36, and 37 show other varieties of the small diaper system of decoration carried all over the space. In No. 34 this consists of a small trellis leaving diamond-shaped compartments which are alternately filled up solid with gilt lines, and decorated with a sprig in the centre. No. 37 is a better design, consisting of small compartments nearly circular, each ornamented with a sprig; the curved lines have a better and richer effect than the straight-lined trellis. In case N, No. 2 should be noticed, a large bible (1660) of very bold and rich design, divided into panels filled up with minute surface ornament and leaving a blank quatrefoil in the centre of each; the spaces outside these panels are occupied by large bold flowing sprigs of foliage of fine design: there is a special character in this which distinguishes it from the general run of the book designs. In five very fine specimens in case N, Nos. 18 to 22, we have examples of the effect to be got by silvered strap-work and the partial use of inlay of different colours in the ground; these are filled up with a profusion of minute tooled scroll-work design; in No. 18, the finest of the five, the outlines of the ornament are formed by minute gold dotting, producing a much softer and richer effect than lines. A red morocco bible of the eighteenth century (No. 26), covered with gilt tooling, is an example of the tendency to elaboration and sparkle without breadth or richness of effect which characterises so much of the more modern binding as compared with examples of a century previously. A prayer-book (No. 44) is an example of special character in design, the gilt tooling being arranged so as to develop a cross on the black morocco ground, the top and bottom being panelled in a kind of pediment shape, with the spandrels filled up with tooled design. No. 36, a bible, in the same case, is the first example (eighteenth century) of a device which is found again in Nos. 18, 31, and 32, in case O, of treating the centre portion of the cover with tooled lines radiating from a centre and forming a circle at their termination; a poor and rather claptrap form of design which appears to have been popular at one period. In case O No. 23, an English eighteenth-century binding illustrates the bad effect of square crossed lines; this is strap-work carried in lines parallel to the edges of the cover and interrupted by circles or half-circles at the angles; a poor and mechanical type of design, the earlier suggestion for which seems to be found in the Italian binding of the seventeenth century, No. 4 in case P. In this latter case is a very artistic "probably French" binding of the seventeenth century (No. 15), in which the back is divided up the centre by a thin double vertical line, from which central axis beautifully-designed sprays of foliage design seem to emanate, not symmetrically, but with almost the freedom of nature, though quite sufficiently conventional in detail. This is a suggestion of the kind of feeling which we want to see more developed in bindings; a departure from mere formal lines and the employment of free and unfettered decorative design. Not that we would have all bindings adopt such a type; many of the symmetrical types are very fine and very suitable for their position; but the more free and fanciful type of design has been little developed in comparison with the symmetrical forms.

In case Q are some examples of the work of that eccentric enthusiast in his art Roger Payne, who gloated over his own work in such glowing terms in sending in his accounts: "the outsides furnished in the highest taste with ornamental corners of oak leaves and small tool" . . . "Finished very neat, lettering very correct, and is a specimen of curious Russia work, not clumsy, but exceeding neat" &c &c. Roger's pride in his honest workmanship was quite justifiable in one sense, but he was mistaken in thinking himself an artist in designing. In the preface he is referred to as the only English binder who invented a style of his own; this may be, but the style is worth very little, consisting only of widely-spaced parallel lines round the cover, and a thin kind of ornamental wriggle inside, with similar wriggles in the angles between the lines. Among the nineteenth century English designs most are, as is remarked in the preface, imitations of older types; here and there are some which possess a special character and good taste. An Anacreon (Q 24) by H. Walther, is merely a red back with two double parallel lines at a little distance round the edge, their angles connected by a double triangle figure at the corner; it is this detail which gives the *cachet* to it, simple but in good taste. Staggemeir's binding of Wood's "Zoography" (Q 27) attempts a symbolical design in an ornamental border of small animal figures, well carried out; this kind of allusion in the binding to the contents of the book is an idea not to be neglected, though it may be carried too far: here it is kept quite subordinate and conventional. A binding by F. Bedford (Q 34), a rich gold tooled diaper based on quatrefoil forms, is a fine and artistic piece of work. French bindings of the eighteenth and nineteenth centuries are collected in Case R; they are not very remarkable in design for the most part. A Decameron by Simier (R 37) is a fine bold design in broad strap-work, and Padeloup's Decameron (6) (eighteenth century) is a good binding of a diaper pattern based on waved vertical lines touching at the apex of the convex curves and forming small panels. Padeloup's "Heures" (7) is another good example. The most noteworthy of the nineteenth-century French bindings, however, is one in a grave and severe style, a folio, "Myriobiblon" (R 28) by P. Bozérian Jeune. This is a dark calf binding with a border formed by parallel lines, the space between which is filled by multitudinous gold dottings just suggesting a pattern without defining it, giving a rich and unusual effect; the centre portion is decorated by two large lozenges, defined by thin lines, overlapping each other and leaving a smaller lozenge in the centre defined by double lines with blind tooling between: the outer angles of the lozenges are very slightly decorated. The idea is very simple, but the slight amount of ornamental detail is most delicately designed and executed, the whole forming a binding of sober and monumental character and in perfect taste.

The collection leaves one with the impression that there is a great field open for new invention in high-class binding. The last-named example suggests the idea of variation in character in relation to the nature of the book which is to be bound, an idea which Mr. Cobden Sanderson has strongly insisted upon. Because some bindings should be rich and fanciful there is no reason why others should not be severe and monumental in character,—there is room for both. The binding

should in a distant and symbolical manner suggest the character of the book which it covers. This will not be achieved, however by the clever imitation of old types, however good in themselves. Original thought must be brought to bear on it.

IRON JOISTS AND STANCHIONS.

BY W. DUNN, A.R.I.B.A.

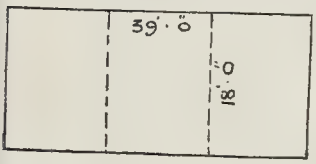
THE two diagrams published herewith are intended to save the labour of calculation in determining the sizes of rolled iron floor-joists, and the necessary sections of cast-iron stanchions.

The table of rolled iron floor-joists is calculated for an equally-distributed load of 1 cwt. per square foot, including the weight of the floor.

The weight of a crowd of people on a floor could not exceed 84 lbs. per square foot, and the weight of a wood floor, even of large span, will be under 28 lbs. per foot. But the question of the maximum load to be provided for is intimately connected with the maximum stress produced by it in the metal. Here that maximum stress has been taken at 5 tons per square inch, so that a sufficient reserve of strength is provided for casual and temporary excess of load. The tables showing the strength of the various sections of rolled-iron joists, published by the merchants, are usually calculated for a stress of about 6¼ tons per square inch, so that this diagram gives approximately the same results as if we had reckoned the floor load at 1¼ cwt. per foot, and taken the limit of safe stress adopted by the merchants.

As examples of the use of this table we may give the following:—

1. The floor of a room, 39 ft. long and 18 ft. wide, is carried on two rolled iron



joists, which divide it into bays of 13 ft. What is the necessary section?

Here the span is 18 ft., and the distance from centre to centre of joists is 13 ft.; that is, the area of floor carried by each joist is 18 ft. by 13 ft.

Find the intersection of the 13 ft. horizontal with the 18 feet vertical; the curved lines cutting that vertical above the intersection show the joists which may safely be used. 12 in. by 6 in. by 56 lbs. per foot run would probably be the most convenient; 15 in. by 5 in. by 52 lbs. would be the lightest.

2. The floor of a long room, 18 ft. wide, is to be carried by rolled iron joists, 10 in. in depth. What is the necessary section, and what is the maximum distance apart?

The span being 18 ft., on the eighteenth vertical find the intersections of the curved lines of the 10-in. joists. By noting the corresponding horizontal divisions we find that:—

a 10 in. × 4½ in.	× 32 lbs.	may be used	6 ft. apart,
or a 10 in. × 5	„ × 36	„ „	7 ft. 1 in.
„ 10 in. × 6	„ × 44	„ „	8 ft. 11 in.
„ 10 in. × 6	„ × 56	„ „	11 ft.

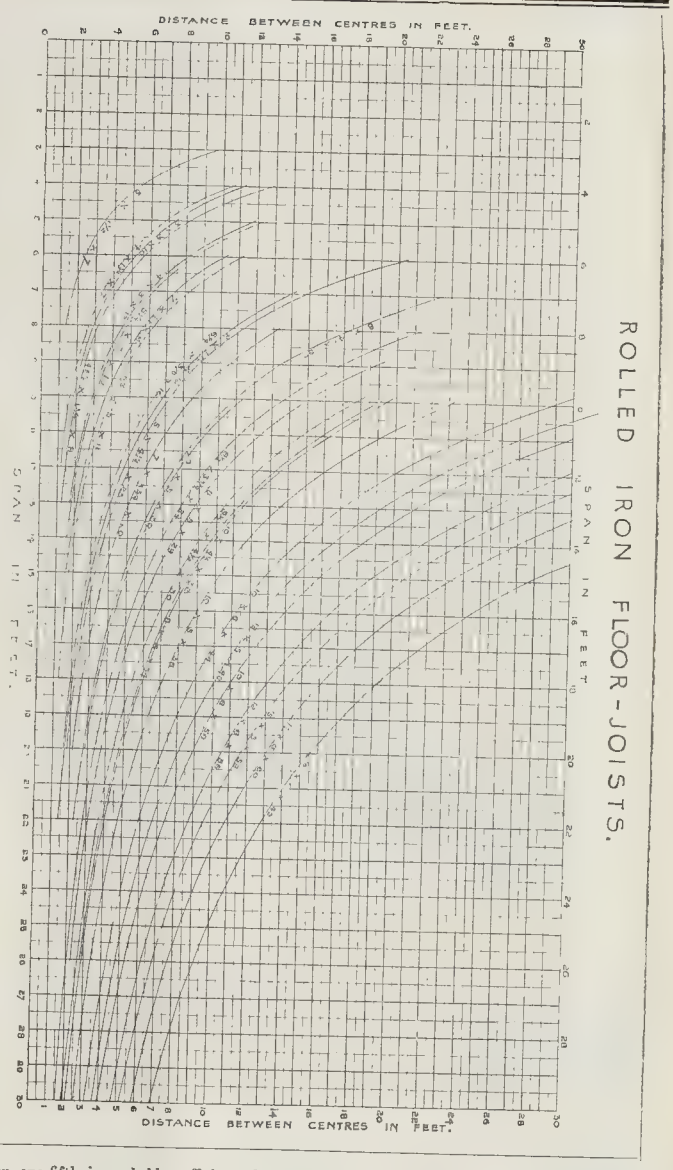
If we may adopt any or all of these divisions, and desire to know which entails the least weight of metal, we must divide the weight per foot run by the distance apart. The result is the weight of iron required per square foot of floor area.

The diagram (see next page) showing the area of metal required in cast-iron stanchions of H and □ section is calculated from Gordon's formula, given in the corner of the sheet. The factor of safety is given by various authorities as one-fifth, one-seventh, and one-tenth. If the centre of the load coincides with the vertical axis of the stanchion, then one-fifth is probably sufficient; but we can rarely ensure that, and it is better to take one-tenth to allow for unforeseen deviations, such as are caused by the deflection of beams or by unequal loads, bringing the centre of pressure nearer one edge of the pillar. The diagram is calculated for both factors, however.

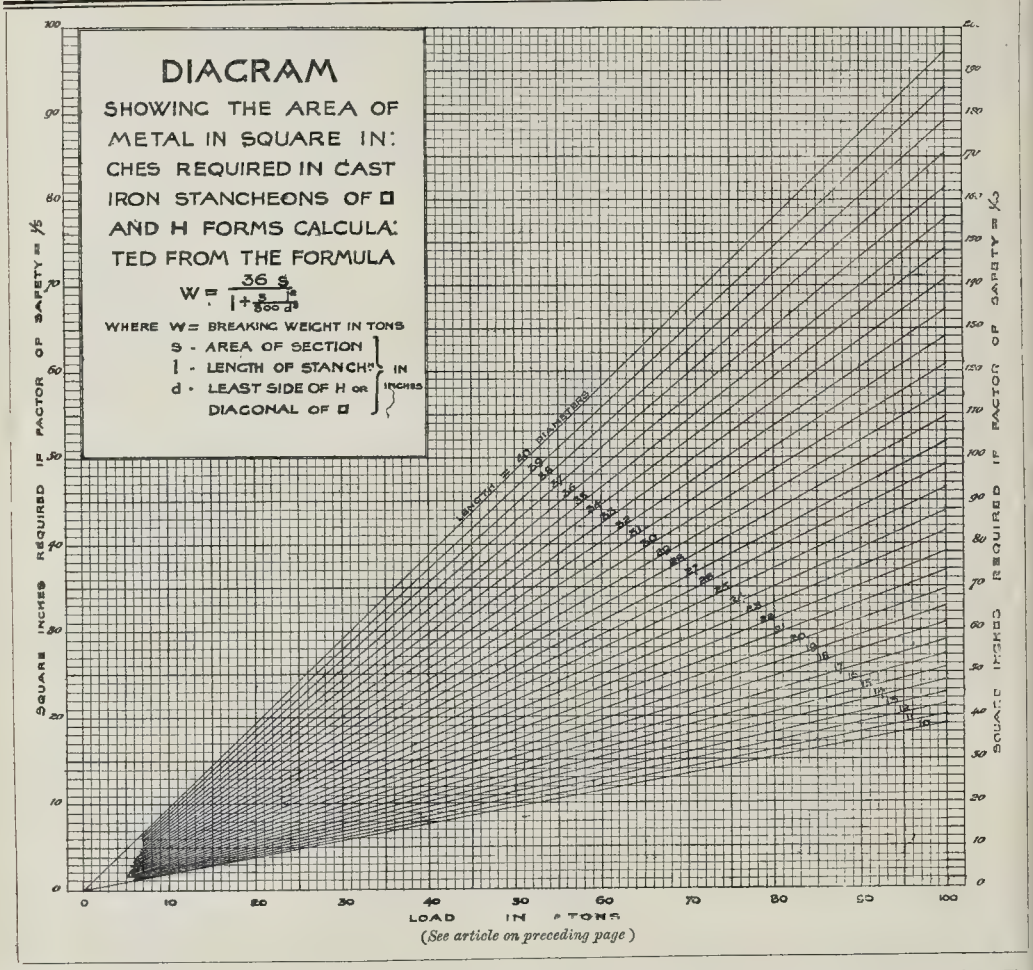
As an illustration, it is required to know what area is required in a H section 12 ft. long and 6 in. least side, bearing a load of 56½ tons. The height is thus twenty-four times the least diameter. On the vertical line corresponding to the load find the intersection of the raking line marked 24, and follow the corresponding horizontal line to the end, where we find that with a factor of safety of one-fifth, 24·7 square inches, or with one-tenth, 49·5 square inches is required.

Thus, adopting one-tenth, a section H–, 6 in. by 20 in. and 1½ in. uniform thickness would be suitable.

By the aid of these diagrams we are enabled to save a great deal of arithmetical labour hitherto necessary each time a floor-joist is required, or a stanchion is designed. The graphical form into which the results are put appeals more readily to architects than a series of figures, however complete, and shows more clearly the results of variations in the different factors such as the sections, spans, and distances apart in the case of the joists, or the ratio of the diameter to the length in stanchions.



MEMORIAL OBELISK, LEADHILLS, LANARK.—A memorial which has been erected at the village of Leadhills to William Symington, the inventor of steam navigation, was unveiled by Lieutenant-Colonel Hare on the 12th inst. The memorial takes the form of an obelisk of Greek design, about 30 ft. in height. It is of polished granite from the Ben Cruachan quarries, near Loch Awe. On the back and front are inserted bronze medallions, the front being a portrait medallion of Symington. The medallion at the back represents a model of the *Charlotte Dundas*, the boat in which Symington first successfully applied his invention. The memorial is the work of Messrs. Wm. Mossman & Co., Glasgow. It cost over 300*l*.



(See article on preceding page)

NOTES.

ON Tuesday, the House of Commons Committee which has been investigating the Bill promoted by the Manchester, Sheffield, & Lincolnshire Railway Company for a new line to London, threw out the Bill. This was somewhat unexpected. But, in truth, it was the right course. It had become evident as the inquiry went on that a mistake had been made in regard to the London terminus. To sanction part of the scheme would have been unreasonable. But it also became apparent as time went on that the public need for such a trunk-line was much less than the promoters asserted. It also became clear that by agreement the Great Northern Railway was, in a sense, a partner of the Sheffield line, and that the Bill was an attempt by one partner to break an agreement long acted on. If such agreements are of any value they cannot be set aside lightly. Of course, it is said that Sir Edward Watkin will re-introduce his Bill next year, but we doubt if it will have greater good fortune. The Committee which has considered it was one of the best that has been seen for a long time, and there is no reason to suppose that its decision is wrong.

MR. SMITH, in the House of Commons on Tuesday, announced the fall, for the present session, of several important measures. The Private Bill Procedure (Scotland) Bill is abandoned. Thus a useful reform is deferred, and for some time longer Scotch private Bills will still go before Parliamentary Committees. But the change is only deferred; eventually it will take place. The Government hope to pass the Industrial Assurance Bill, but it is obvious that they have much doubt on the subject, and we think that it is hardly likely to become law during the present session. Then the Public Trustees Bill has also to go. The fact is, that unless the House of Commons gives much more of the work to be done by Committees, it is altogether impossible to pass more than a few of the measures which are introduced by the Government early in the session.

THE Railway Rates Inquiry is being pushed on by the Joint Parliamentary Committee, the chairman (the Duke of Richmond) making a very urgent appeal to the disputants last week to reduce the number of amendments as far as possible. A large number have accordingly been withdrawn, it being recognised that should the inquiry be unduly protracted, it will run on to the end of the session, and the whole matter consequently stand in danger of being shelved once more. This would be unfortunate, as all concerned are getting tired of the controversy, and are desirous of a settlement; and although there is a feeling of uncertainty as to what the effect of the new system may be, and a natural disinclination to risk the loss of advantages which have been gained at previous stages of the inquiry by undue precipitation at this point, there is a general desire to see the scheme in operation. The last few sittings of the Committee have been devoted to technical details affecting the classification, which are of more concern to the agricultural community than to the building and engineering trades,—the question of rates for conveyance of milk, for instance, occupying a considerable time, and resulting, for once, in a reduction of the Board of Trade proposals.

IN regard to his drawing of the National Gallery Front in the Royal Academy, Professor Aitchison wrote to the *Times* of the 12th to the effect that his modification of Wilkins's building arose from the conviction that Wilkins "would have enforced the ends of his front and have put domes of less importance than the central one to complete the composition." It therefore appears that the drawing in the Architectural Room at the Academy is Professor Aitchison's own speculation as to what Wilkins might have done if he had been allowed his own way, and does not rest on any documentary evidence. This of course does not affect its value as a design, perhaps rather increases it; but it puts the drawing on a different footing from what we had supposed. Touching the subject of Trafalgar-square generally, we observe a suggestion by Mr. C. Roberts, in a recent letter to the *St. James's Gazette*, that the balustrade and terrace should be removed from the north side of the square and replaced by a large flight of steps back to the

roadway. His argument is that the balustrade and terrace obstruct the way through the square, and that the terrace is only a refuge for tramps. This is a practical objection, but we do not think such degree of architectural effect as the square and the National Gallery can be said to have would be improved by the change.

IN a letter in the last number of the *Journal of Proceedings* of the Institute of Architects, Mr. Arthur Cawston calls in question the system of intermediate ventilated passages between wards and water-closets in hospitals and other buildings of similar class, and says he is informed that much pulmonary illness is due to this. What he suggests is that if the closets were kept at a higher temperature than the wards the suction would be the other way, and that the intermediate cross ventilation passage might be dispensed with. This is a rather serious alteration in the principle of planning hospital wards. No doubt if the air from the water-closets can be entirely prevented from contaminating the air of the ward without the interposition of the cross-ventilation passage, so much the better; but it would require a very certain and well-arranged system of extract from the water-closets to ensure that it would not do so under these circumstances. Perhaps it might be ensured by an intermediate passage without cross ventilation, but with a powerful extractor at the top. Mr. Cawston goes on to urge that in private houses also the water-closet should be kept at a higher temperature than the rest of the house, in order that the pull may be *from* the house into the closet, and not from the closet into the house; and he adds that in winter the only window always open in a private house is the water-closet window, which thus becomes the feeder for the ventilation of the house. We can tell him of one private house, at all events, where the staircase windows are open all the year round; and the idea that the water-closet should be kept warmer than the rest of the house, for the reason named, was advocated in our columns long ago. Of course, to do this efficiently presupposes a hot-water heating system; but it may be done to some extent, as we pointed out before, and as Mr. Cawston now repeats, by an upcast ventilating shaft with a gas-burner in it.

THE Architectural Association are proposing to publish by subscription a memorial volume to the late J. D. Sedding, consisting of about thirty plates of examples of his work, accompanied by a portrait and a short memoir. The volume is to be in about the same size and form as the Architectural Association Sketch-book, and it will be issued if the names of at least one hundred and fifty subscribers at one guinea each are obtained. Only a limited number of copies will in any case be printed. Intending subscribers are asked to send their names to the Hon. Secretary of the sub-committee for this purpose, Mr. E. W. Mountford, 17, Buckingham-street, Strand.

THE Eleventh Volume of the "Transactions of the Sanitary Institute"* contains the report of last year's Congress at Brighton, and is full of interesting matter to sanitarians. As usual, we gave a report of the proceedings of the Congress at the time it was held,† but no doubt many of our readers will be glad to possess the whole proceedings of the Congress in a compact form. The most noticeable papers in the volume are the inaugural address by the President of the Congress (Sir Thomas Crawford, K.C.B., M.D., &c.); Dr. Poore's address on "The Living Earth" (a vigorous appeal for the application of excrementitious matters directly to the earth, and a strong denunciation of water-closets and the water-carriage system as wholesale manufacturers of typhoid); Professor Roger Smith's paper on "Baths"; Alderman Hallett's paper on "The Brighton Waterworks"; the Borough Surveyor (Mr. Francis J. C. May)'s paper on "Brighton as a Health Resort;" Mr. R. F. Grantham's paper on "The Disposal of the Sewage of London upon the Maplin Sands;" Mr. Francis Hooper's paper on "Artisans' Dwellings;" Mr. W. Topley's address on "Geology in Relation to Hygiene;" Mr. W. H. Preece's lecture on "The Sanitary Aspects of Electric Lighting"; Mr. R. E. Middleton's paper on "Waterworks Regulations"; and the Hon. F. A. R. Russell's paper on "A National Health Service." There are several other interesting papers which we have not space to enumerate, and altogether the volume is one which presents much suggestive matter to the student of sanitary matters, although there are many points in some of the papers to which we could take exception, and with which, in fact, disagreement was expressed in the discussions at the Congress.

* London: Edward Stanford. 1891.
† See *Builder* for August 30 and September 6, 1890.

AT the second *conversazione* of the Royal Society on Wednesday evening last, Professor Norman Lockyer exhibited some photographs of the Temples at Karnak and Edfou, with reference to their orientation. He stated his belief that they were constructed for astronomical purposes, and gave several reasons in support of this view. He further remarked that, assuming his hypothesis to be an actual fact, it would be possible by means of calculations with regard to the obliquity of the ecliptic to prove the age of the temples. We may point out, however, that owing to the differences of opinion as to the time required to effect the astronomical changes alluded to, it would not be possible to fix their age to within 400 or 500 years. Still that is something. Mr. Shelford Bidwell showed a nickel pendulum, illustrating the effect of heat upon the magnetic susceptibility of that metal. Nickel, which at ordinary temperatures is a magnetic metal, becomes non-magnetisable at about 300 deg. C. Mr. J. Joly exhibited the "Meldometer," an instrument for determining the melting points of minute quantities of substances, by comparison with bodies of known melting point. The method consists in measuring the thermal expansion of a ribbon of pure platinum when a minute quantity of a substance, dusted on its surface (and observed through a miscroscope) is melting. Messrs. Tiffany & Co., of New York, showed some art metal work illustrating the amalgamation of different metals. Professor W. Roberts-Austen had a new brilliantly-coloured alloy of gold and aluminium; whilst Professor Church exhibited specimens of Japanese metal work. Professor Sekija's model of the highly complex path pursued by a particle on the surface of the ground during the earthquake of Tokio, on January 15, 1887, was particularly interesting. Information respecting earthquake motion derived from this method may be applied in the construction of earthquake-proof buildings. Prof. J. J. Thomson illustrated a system of discharging without electrodes through gases; and Prof. Perry an indicator for engines, correct at the highest speeds. An instrument for examining the strains in bent glass beams, by Prof. Carus-Wilson, is of much practical value. It has been used to determine the action of "surface loading," and to show to what extent this action affects the state of strain in beams supposed to obey the Bernoulli-Eulerian theory of flexure. A number of designs were exhibited by Prof. Haddon, illustrating the geographical distribution, and the progressive and retrogressive evolution, of art and ornament in British New Guinea; and Prof. Newberry (of the Egypt Exploration Fund) showed a series of facsimile drawings in colour, executed by Mr. M. W. Blackden, of some of the most interesting paintings on the walls of the tombs of Amenī and Khnumhotep (XII. Dynasty, *circa* 2,500 B.C.), at Beni Hasan, in Upper Egypt. The conversazione was well attended and highly successful.

THE interesting exhibition which is open during this week at Carpenters' Hall, Throgmorton-avenue, expresses very clearly the connexion of the Carpenters' Company with technical education, and with the trade whose name it bears. The exhibition consists ostensibly of the works submitted in competition for the wood-carving prizes offered by the Company; but in addition to these there are shown many simple articles of wood, iron, and lead, mostly of a domestic nature, and showing capital workmanship, which have been made by the youths who attend the technical schools, which are doing such a useful work on the company's estate at Stratford. Around the walls are hung drawings made in the Construction Classes of King's College; these classes also are financially assisted by the Carpenters' Company, we understand. The most interesting part is undoubtedly the wood-carving, which is mostly applied to glove-boxes, clock-cases, picture-frames, and friezes and panels, mostly of Renaissance design. The workmanship is in many cases excellent, especially in the cases of the decorative treatment of foliage. The attempts at carving the figure are hardly so satisfactory, though we may except a small panel, No. 24, by Mr. Bull, which shows much grace of line, and a bracket by Miss M. S. Smith, of the School of Art Wood Carving, South Kensington. The first prize and bronze medal has been awarded to Mr. James Osmond, for a mantel-frieze and frame, which, though in high-relief, is a capital piece of work; for preference we, however, should name a small oak panel, by the same artist, which takes the second prize. We are informed that the next exhibition of this kind is to be on a much more extended scale. The efforts of the Carpenters' Company in the cause of technical education for the artisan class have our best wishes for their success.

ON Monday afternoon, the 15th inst., the Bridge House Committee of the Corporation of London visited the Tower Bridge works, and made one of their periodical inspections. Very considerable progress has been made with the steel work during the last six months, all the columns on both piers and abutments being completed. The overhead footways are now being commenced, and as these will be built out horizontally, at the height of 140 ft. above high water, they will form an interesting portion of the work. The masonry which is to surround the columns is also being proceeded with, and a large quantity of the machinery for working the hydraulic lifts and central span is now being fixed. Each of the main pivots for the opening span weigh 28 tons, and these are now being delivered at the site. It is very satisfactory to learn that during the last eighteen months there has not been a single accident of a serious character.

THE marble head of an athlete which was exhibited to the Society of Antiquaries last week was found in a well in Arundel-street, Strand, where some new premises, the "Clock House," are being built, and we understand that it is claimed to be a relic of Lord Arundel's collection. If this be so, the fragment comes before us as a silent witness to events of more than two hundred years since. For Thomas, only son to Philip, Earl of Arundel,* bought of W. Petty the statues, busts, and inscribed stones which had been discovered in Paros, *circa* 1610. Earl Thomas deposited these in the rooms and gardens of his riverside house by the Strand. The statues in the garden evoked Bacon's exclamation, "The resurrection." There they remained until Selden and Evelyn prompted his grandson Henry, afterwards sixth Duke of Norfolk, to present most of them to Oxford University

* Eldest son of Thomas, fourth Duke of Norfolk beheaded 1572. He inherited from his mother the feudal earldom of Arundel: died in the Tower, 1595. The honours of Arundel and Surrey were restored to Thomas by James I.

(1667): his library he gave to the Royal Society, who had held meetings at his house. In J. T. Smith's "Antiquities of Westminster" is a plan of the house and garden, copied from Ogilby & Morgan's large-scale plan of London, etched by Hollar. The site lay between Milford and Strand-bridge, since Strand, lanes. The house had been an "inn" of the Bishops of Bath and Wells; close by were the Holy Ghost Chapel, the parish church of St. Mary Ursula and the inns of the Bishops of Chester, Llandaff, and Worcester, and the Strand Inn of Chancery, all taken for Edward, Duke of Somerset's new house. King Edward VI. bestowed Bath Inn upon Lord Thomas Seymour, after whose execution it was bought for 41*l.* 6s. 8d. by Henry Fitz Alan, Earl of Arundel, whose daughter and heir, Mary, was first wife to Thomas, fourth Duke of Norfolk. The house, repaired with some of the marbles, was pulled down in 1678, but the property on its site has, we understand, always belonged to his successors in the title. Hollar's etchings, after Adam & Bierling, 1642., prized by collectors, of the court-yard and other portions, show that the buildings, excepting the great hall, were mostly of a mean character, low in elevation, and gabled. The court-yard and principal apartments ranged midway between the Strand and the river, next against Milford-lane, on ground now traversed by Arundel-street. Earl Thomas gave lodgings to Hollar, who is reputed to have done some of his best work here, including a view of the town as seen from the roof looking eastwards.

THE Secretary of the Metropolitan Public Gardens Association writes, apropos of the late omnibus strike, as to the need for more seats in or near public thoroughfares. He also points out that though this Society frequently offers to put up seats, the Vestries will not allow it. It is much to be hoped that local bodies will amend the error of their ways in this respect. Many more seats are needed. In such a place as the Kensington-road, for example, there might be seats. Trees also go with seats, and there are various places in the metropolis where not only seats but trees might be placed.

ACCORDING to Section 15 of the Metropolitan Streets Act, 1867, it is unlawful between the hours of ten o'clock in the morning and six o'clock in the evening to unload coal on or across any footway, and also to draw or lower casks, whether empty or full, in the same manner. We doubt if the section is as well known as it should be, for there cannot be a doubt that it is constantly contravened. That, however, is not the reason we now refer to it, but it is in consequence of the recent decision of the Queen's Bench Division in the case of Fletcher *v.* Fields. The simple point was whether coals included coke, a quantity of which had been unloaded, in contravention of the Act, in Victoria-street. It was natural that the Court should decide,—thereby differing from a police magistrate,—that coal and coke were not the same, and that they could not stretch the Act so as to include the latter article. Of course, in common sense, the same law should be applicable to coke as to coal; the unloading across a footway of coke is as much an obstruction as the unloading of coal. But judges are not legislators, and if the unloading of coke is to be prevented between certain hours, the Act of 1867 must be amended by Parliament.

WE are constantly thinking that we have come across the most audacious proposal possible for fleecing the architectural profession by the process called "architectural competition," but we constantly again come upon propositions which seem to put their predecessors in the shade in this respect. The last specimen is an advertisement in the *Western Mail* for procuring designs for new schools in Glamorganshire, which runs as under (omitting the name):—

"Architects are Invited to Forward (Free of Expense) on or before Tuesday, June 30 instant, Plans and Specifications, and also an Approximate Estimate of the Cost (which must not exceed 15*l.* per head) of Building an Intermediate School at ——.

The School is to be a Dual School for seventy Boys and fifty Girls.

The Application to the Building Committee to be Anonymous, and the correct name and address must be sent to me in a sealed envelope, marked 'Plans, &c., for the Intermediate School, ——.'

No pledge is given by the Committee that any of the Plans, &c., will be accepted, but should either of the Plans be selected, a fee of 10*l.* 10s. will be awarded to the successful competitor, whose Plans will thereupon become the absolute property of the Building Committee."

We think it will be admitted that this beats the record for cool acquisitiveness,—architects are invited to send drawings, "free of expense," for a school which according to an average computation ought to be worth to the architect a fee of about 100*l.*, to a committee who do not pledge themselves to accept a single plan or to incur any responsibility or cost at all, and who if they do condescend to be pleased with one of the plans, will vouchsafe to purchase it from the architect for one-tenth its proper value. What sort of "architects" do the Committee expect to attract by such an offer? And how do they expect on such a system to fulfil their obvious duty to the community of providing that the schools they are about to build are constructed in a proper and sanitary manner?

ARCHITECTURE AT THE ROYAL ACADEMY.—VIII.

1,877. "Doorway, Foundling Hospital, Cordova;" and 1883, "Entrance to Capilla Real, Granada Cathedral;" Mr. F. W. Bedford. Two pretty and delicately executed monochrome drawings.

1,878. "Design for Altar-piece;" Mr. T. Cowlishaw. A painting of the Annunciation in a kind of florid Paolo Veronese style, with a highly ornamented Renaissance order as a framework to the painting; not very religious in taste certainly, but there is a certain vigour and spirit in it.

1,879. "Pulpit, English Church, Rome;" and 1,880, "Font, St. Michael's, Smethwick;" Mr. A. E. Street. These were illustrated and described in the *Builder* for May 30 last. They are shown in water-colour drawings. There is a quiet originality about both, but the font is much the best, and is a really interesting bit of design; the pulpit strikes us somewhat too "handrailey" in general appearance.

1,882. "Proposed Church, Sutton, St. Helens;" Messrs. Paley and Austin. A good pen-drawing of a Gothic church in which simplicity and solidity are the predominant qualities. The tracery shows Perpendicular character, but without cusping and with very substantial section of mullions and tracery. The tower at the crossing is very plain, except for a row of square-headed traceried windows in the upper story; the tower parapet is stepped up at the angles. The whole has a very satisfactory appearance.

1,885. "Interior, Sta. Maria dei Miracoli, Venice," Mr. H. L. Florence. A small water-colour interior looking towards the high altar, and the steps and tribunes preceding it.

1,886. "Painted ceiling, Loggia dei Nobili, Sienna;" Mr. F. W. Bedford. This is a little gem of a drawing of its class, showing with great delicacy and finish of execution a typical Renaissance ceiling design of unusual elaboration; one of those with lunettes containing figure subjects in each compartment, and the remaining space occupied with that extraordinary rigmarole of masks and wisps and twists of all kinds in which the Renaissance decorator delighted. It is impossible to call it good art as a whole, but it is of good design and drawing, in bits. The author of the drawing has taken a great deal of trouble over his daintily executed illustration.

1,887. "Proposed New Church at Ealing, View of Tower;" the late J. D. Sedding. Hardly one of the best of its late author's designs, but it is a striking and original treatment of a tower. The upper part of the tower is divided into three tall narrow bays by great mullions connected by arches at the top, these spaces being subdivided by mullions and panelling; in the centre compartment are windows above and below, with two bas-relief figures between. The lower part is flanked by octagonal turrets with the cupola terminations that Sedding was so fond of; and below is a porch with a large traceried window over, also flanked by turrets, this time battlemented, like the finish of the main tower. The tower stands between trees in a strongly coloured water-colour drawing, taken from a high point of sight.

1,890. "Design for New Municipal Buildings, Sheffield;" Mr. F. H. Tulloch. This should have been noticed in our first article on the municipal architecture in the collection, but was overlooked. It is a design in modern "Free Classic" style, picturesque in detail, but spoiled by the too-frequent repetition of the same form and height of gable; three gables all the same height and design along the front, each flanked by the same octagonal turrets; this wants point and centralisation. The diminishing open stages in the upper part of the tower are rather too pagoda-like in effect.

1,891. "Six Cottages at Elstree Herts;" Messrs. J. H. T. Woodd and W. Ainslie. Pretty country semi-detached cottages, which probably, however, owe their position to the pleasant and effective character of the picture, a pen-drawing in brown, in which they are shown.

1,893. "Design for a Frieze;" by Mr. Arthur Gwatkin; a capital bit of work, in which foliage is used in the undulating scroll form so common in Roman and Renaissance work, but with a different and somewhat more naturalistic type of foliage. The character of the whole thing, however, is sufficiently broad and conventional, and it is very rich and effective.

1,895. "Design for Billiard-room, Brooklands;" Mr. R. T. Blomfield. A sepia sketch, hasty but effective, of an interior with a wide fireplace recess flanked by square columns and with a decorated frieze over, in the long side of the room; at the end is an arched recess with its floor on a much higher level, a kind of "nook," and a kind of sofa appears to run across beneath it: but whether the young lady who sits jauntily on the edge of the upper floor with her feet on the sofa is illustrating the intended use of this part of the room is not apparent. There seems no other way of getting up than jumping on the sofa. It is a nice-looking room, however.

1,896. "Royal Masonic Institution for Girls, Centenary Hall: Design for the West Window;" Mr. E. Frampton. Rather an unusual window in arrangement; it is of the Perpendicular type, with many lights, four of the larger upper lights containing "Virtues," the smaller ones heraldic devices; the line of panels across the centre is occupied with scenes having some reference to the history or objects of the Institution, the arms occupying the centre panel; of the eight lower panels seven are occupied by the portraits of Grand Masters, the Prince of Wales in the centre, and the Royal Arms in the centre panel underneath. The filling-in of the compartments containing the portraits is well contrived and very decorative in effect; the window is of considerable interest, and will probably have a good effect as a whole.

1,897. "A Country Gentleman's House;" Mr. C. Spooner. This is a R.A. Travelling Studentship design; it shows two elevations of a stone house with mullioned windows and timber-gablets in the upper portion. A small plan is given, which does not seem arranged with much consideration as to its actual working, or lighting in some places. The elevations are pleasant, and suitable for the idea of a rural house.

1,898. "Congregational Church, Ashton-under-Lyne;" Mr. John Brooke. A good interior pen-drawing of a Gothic church with a hammerbeam roof, very orthodox, but presenting nothing to distinguish it from many other modern Gothic churches.

1,899. "Chimney-piece in Indian rooms in the New Hotel, Salisbury Estate, Thames Embankment;" Mr. J. Tavenor Perry. This is a sensational piece of work, apparently, but too high to be properly seen; it is a large fire-place, designed with Hindu detail and very highly coloured. It appears to be well carried out for the kind of thing. No. 1,901 shows one of the Indian rooms in the same hotel with yellow marble (?) columns with blue capitals and red pedestals supporting a highly-decorated ceiling. Why all this outbreak of Indian interiors in a new hotel on this site? Is it to catch possible or probable Rajahs visiting London?

1,900. "Case of the Grand Organ, Town Hall, Sydney;" Mr. Arthur G. Hill. We cannot say this suggests anything new (so sadly wanted!) in the artistic treatment of the organ-case. It is only the old device of larger and smaller "towers" of pipes. The main bulk of the instrument stands under a great elliptic arch, which springs from an architrave carried on two columns at the sides; between the columns are smaller sections of the organ forming their own design. Probably no great expenditure was allowed on the case, to judge from the design, but it is a pity that something more should not have been done, financially and artistically, on such an opportunity.

1,902. "All Saints', Compton Leek; painted decorations in Chancel;" Mr. Gerald C. Horsley. The nearer portion of the chancel wall is occupied by a Gothic-looking diaper ornament arranged on net-work lines; beyond this, on the eastern part of the wall, is a decoration in gold and green of which the effect only is seen; the design is hardly made out, nor does there seem any sufficient reason why the wall design should alter just where it does. Above the wall diaper is painted a conventional tree-trunk which branches out over the whole upper part of the wall, and among the foliage of which are open books displaying texts; near the trunk two angels stand under the foliage; the whole being treated in a quite flat and decorative manner. The roof timbers are painted in a manner based on Mediæval examples. The remainder of the decoration is original in design, and the colour effect of the drawing has a decided character of its own.

1,903. "Archaic Ionic Capitals, Acropolis, Athens;" Mr. R. W. Schultz. These are admirably-executed water-colour drawings, of rather fragmentary Ionic capitals; the author has conveyed very truthfully the colour of the partially stained marble, and the remains of coloured decoration on it. Two of these capitals appear to have the volutes flat on the face, the spirals merely painted without being modelled; one of them with an inlet piece of red marble as a central boss, standing above the main surface.

1,904. "East Window, St. Mary's Church, Leigh, Lancashire;" Messrs. Shrigley & Hunt. A large Gothic window with small figures and ornaments in the upper panels and larger figures beneath tabernacle work in the large panels below. The colour is delicate and harmonious, and the whole effect very good in a decorative sense, and the coloured drawing well executed.

1,905. "Design for a New Church, Heap Bridge;" Messrs. Preston & Vaughan. This is a very artistically-executed pen drawing, showing a pretty rustic-looking country church, with low walls and high roofs. Over the crossing the roof is raised, but in a saddleback form parallel to the lines of the nave roof, with a quaint but not unpleasing effect for the kind of church.

Near this is a view of some projected new mansions which we do not notice more particularly or by name, as we only mention it here to point a fresh moral as to the way in which the Architectural Room is managed. The drawing referred to was offered to us for publication in the *Builder*, and declined at once, as a drawing which, whether in regard to style or execution, it could be no credit to us to publish. Yet here is this drawing (a large one too) occupying space on the walls of the Royal Academy of Arts, which surely, one would think, should keep at least as high a standard as can be maintained in a weekly journal. There are one or two other drawings in the room which we had previously declined to publish, but none as bad as the one referred to; and on the other hand we know of the refusal of important drawings by architects who *must* have sent better things than this. Does any competent person look after the architectural hanging at all? Or is it left to the porters, and governed by the consideration of the size of the frames?

MASTER MASONS' ASSOCIATION OF GLASGOW.—The members of this Association had their annual excursion on the 9th inst., starting from Glasgow per rail to Lochearnhead, thence per coach to St. Fillans and Comrie, where the party dined at the "Royal" Hotel, and thence drove to Crieff, and took rail to Glasgow. Deputations were present from the Glasgow Architects' Association and Glasgow Measurers' Association, and also two from each of the Edinburgh Master Builders' Association and the Dundee Master Builders' Association.

CONGRESS OF FRENCH ARCHITECTS.

THE nineteenth Congress was opened in the Hemicycle des Beaux-Arts at half-past two on Monday. On the platform were M. Chas. Garnier, President of the "Société Centrale des Architectes Français;" MM. E. de Joly and Achille Hermant, Vice-Presidents; MM. Daumet and Alfred Normand, "censeurs;" MM. Roux and Boileau, secretaries. Among those present in the hall were M. Heret, archiviste, M. Bartaumieux, treasurer, MM. Hardy, Paul Sedille and other members of the Council, M. de Geymüller, M. Eugène Müntz, &c. &c.

In a short opening address M. Chas. Garnier congratulated those present on the recurrence of this occasion for the meeting of the French architects of Paris and the Departments, to live for a week together united in the same ends, which must tend to draw closer the bond of union already existing between the members of the Central and Departmental Societies. After having expressed his regret, which all would share, at not seeing among them the respected President of the Association Provinciale des Architectes, M. Journoud, M. Garnier, following the traditions of the Congress, called to the bureau several Architects of Departments, viz., MM., Marteau and Vandenbergh, of Lille; M. Lecocq, of Dunkerque; and M. Billa, of Nice.

According to the order of the day there followed a somewhat humorous paper by M. Frantz Jourdain on "The Erection of Museums of Architecture." M. Jourdain spoke of the kind of contempt into which works of architecture had fallen, especially those of a purely ideal class, designs not executed, and which in this case brought neither honour nor profit to their authors. He wished that the State should purchase, from the annual Salons, these conceptions of architects, the restorations of ancient buildings and other ideal designs, as they bought pictures, sculpture, and impressions of engravings. It was not sufficient that this should be done occasionally under the rule of an exceptionally enlightened Minister of Fine Arts; it must be made a recognised practice. Ministries changed, as they all knew, and he wanted to see an established precedent for architectural designs to have the chance of bearing, like pictures and statues, the placard "Acheté par l'État," and a decree sanctioning this expenditure as part of the Fine Art budget. Following on this, there should be in Paris and in the Departments galleries established for the exhibition of such works. He had been told recently that architecture had its place in the Louvre, as other works of the industry and talent of man had their place in other special galleries, and that there should some day be a little corridor, leading to the Musée de Marine, in which architectural drawings could be hung. But, he said, we must have something better than that, a more honourable situation for our works; and in the creation of special galleries of architecture we should be able to obtain a considerable representation of architectural design in the provinces as well as in Paris, which would be an excellent step towards the decentralisation of architecture.

M. Roux said that the question was one to be seriously considered, and he believed that the Conseil Supérieur des Beaux-Arts had received a proposition from M. Tetrau, Councillor of State, and that M. Gonse would shortly make a report on it.

M. Chas. Garnier next laid on the table the last circular of M. Yves Guyot, Minister of Public Works*, giving instructions to all officers of the department to be especially careful of megolithic or other ancient remains, as well as later buildings, which they might come across in the process of their work, whether the same were or were not classed by the Commission des Monuments Historiques.

M. Chas. Lucas asked that in the proposed museums of architecture an honourable place should be given to models of buildings, reminding the meeting that the custom of modelling architecture had existed in all previous epochs of art, and mentioning, in recent times, the models executed under the direction of MM. Hittorf, Davioud, Ch. Garnier, and Bouvard.

MM. Garnier and Vandenbergh asking if M. Jourdain had any resolution to propose, he proposed the following:—

"That the Congress of French architects considers that architecture should in future be put on the same level with painting, sculpture, and engraving, and that, as a consequence, drawings and models of architecture should be given an honourable position in the Museums of Paris and of the Departments."

The resolution was unanimously adopted.

M. Rozet, President of the Committee of "Economie Sociale" of the Société Centrale, was announced to read a paper "De l'Architecture et des Conseils d'Arbitrage," but he being prevented from attending by a very recent domestic bereavement, M. Poupinel, Secretary of the Committee, supplied his place by a paper on "Le Rôle de l'Architecture Vis-à-vis du Personnel du Bâtiment;" and, taking into account the lecture given at Bourges in October 1889, by M. Lucas, since the first formation of the Departmental Association, he put forward, as subjects deserving of the attention of architects (1) the theoretic and practical instruction of the building workman; (2) the hours of labour; (3) the safety of the workman; (4) assurance against accidents; (5) the "caisse des secours et retraites;" (6) rewards and encouragements to workmen; (7) the question of wages and of participation in profits; (8) the association of workmen and employers; (9) arbitration in case of strikes; (10) custom-house tariffs and commercial treaties. He appealed to the provincial architects to take up, either singly or in combination, the study of these questions, which were unanimously voted to form part of the order of proceedings of next year's Congress.

M. David de Penanrun then read a paper urging that architects should use all their influence for the re-establishment of the custom of cessation from work on Sunday, and quoted in regard to this question a number of documents taken from the reports of the "Association pour le Repos du Dimanche."

M. Boileau asked, if there was any case for bringing forward a resolution, that M. Garnier would oppose any immediate vote, in order that the subject might be more completely considered the year following.

M. Lucas, supporting that proposition, asked for the substitution of the word "hebdomadaire" for the word "dominical," an amendment which was accepted by M. David de Penanrun; and proposed that an inquiry on the subject, over the whole of France, should be undertaken.

MM. Joly, Ch. Garnier, and Vandenbergh thought that the question had not been sufficiently studied, and M. Vandenbergh objected to any fixed rule enforcing rest; he wanted more liberty.

M. Boileau observed that they were only asking for the study of the question, but M. Ch. Garnier said that it more particularly concerned the contractors and the workmen. MM. Normand, Boileau and Garnier having exchanged some further observations on the topic, a member proposed that along with obligatory rest on Sunday they should also pass a rule for obligatory work on Monday; and, after some hesitation, a vote was taken, and a majority of twenty-nine against twenty-two voted that the subject of Sunday rest was deserving of special attention, and the resolution was drawn up by M. Hermant in these terms:—

"That the provincial architectural societies should make a formal inquiry on this question and should send the result to Paris to be discussed at the next year's Congress."

After some formal business, the meeting broke up at a quarter past four.*

FLUSHING AND TESTING HOUSE DRAINS.—Mr. W. Reynor sends us drawings and description of an apparatus for testing house-drains, the principle of which is that the lower end of the house-drain is plugged by a counterpoised valve where it enters the intercepting trap; and letting bath-waste or other water flow till a ball and lever in a back chamber behind the intercepting trap is raised to a certain height, then observe if the ball index descends at all; if not, the drains are right. The flush is got by then removing the valve-plug, when the water fills the front compartment or real intercepting-chamber to a certain height before the outflow of the drain checks it rising, and thus ensures a full-bore flush. We should rather question the effectiveness of this action for flushing; at all events there are better ways of getting a full-bore flush than that. The test contrivance has the merit of being easy of application, and such as can be used constantly; but it is not a sufficiently efficient test for the air-tight quality of drains. Sufficient air may escape to be dangerous, through an outlet which would be a long time in showing itself by water-escape, and would need a longer study of the index than people are likely to give it.

* This has already been referred to in our columns.

* We will continue and complete the report of the Congress next week.

THE ARCHITECTURAL ASSOCIATION VACATION VISITS:

ROCHESTER.

THE first of the vacation visits this year was made to Rochester, on Saturday last, under the guidance of Mr. Edmund Woodthorpe. The party arrived at Rochester Bridge about 3 o'clock, and proceeded at once to examine the Castle, not forgetting to notice the fine situation and appearance of this grand old keep, which, in spite of its modern surroundings, can still hold its own as the dominating feature of the city as seen from the opposite bank of the Medway. Before entering the gardens which have been formed in the space originally occupied by the "ballium," some of the older portions of the wall overlooking the river were inspected, and the members then entered the keep, which was examined from base to summit, and its several interesting features noted. The plan is a square divided by a thick wall, which has only small openings of communication on the lower floors. In the middle of this central wall the well is placed, with a shaft above it the height of the building, and openings on each floor for the greater convenience of the inmates. There are turrets at the four corners, and in two of them are staircases. The construction of these winding stairs was pointed out. They are entirely of rubble, without any continuous central newel, and the steps are not of stones sufficiently long to reach from the wall to the centre, but are made up of small and very rough pieces with a large proportion of mortar. The arches, which formed a means of communication on the principal floor, are ornamented with the "zigzag" moulding, and the piers have the fluted cushion capitals so often seen in Norman work. From the summit a good view was obtained of the cathedral, immediately to the east, with the hills behind crowned with the forts for the protection of Chatham Dockyard, the red brick buildings of which form a noticeable feature on the river below.

On leaving the castle, a short walk across the site of the old monastic vineyard brought the party into the eastern end of the High-street, and after noticing Jacobean remains in some half-timbered houses, a visit was made to Eastgate House. There is here a good staircase, several carved overmantels, and low-relief carving on some of the beams bearing the date 1591; also some good ceilings. These latter have been so frequently whitewashed that anyone might be excused for taking them for plaster, although it was stated that some of them were found to be of oak.

The next attraction was "Restoration" House, so called from the fact that Charles II. slept here the night previous to his reception by the Lord Mayor of London on Blackheath, where the re-establishment of the Monarchy was formally acknowledged and proclaimed. The present owner of the house (Mr. S. Aveling) welcomed the members, and showed them over the building himself. An enthusiastic lover of the art of the period comprised by the terms Elizabethan and Jacobean, Mr. Aveling makes his own house his especial study, and he is constantly engaged in rendering it a storehouse of the art of the period named, yet without in any way detracting from its charm as a residence. The original oak panelling remains in most of the rooms, and in several there are good mantels. Several of the old windows, after having been blocked up when the window-tax was in force, have been re-discovered and opened, and in some of them the old glass was found and retained. The grand staircase is worthy of study; the walls are hung with tapestry, presented by the king in return for the hospitality accorded him here. There are several interesting specimens of furniture in the house. Mr. Aveling drew attention to a chest in the king's bedroom which was provided with a long drawer at the bottom, and then pointed out others in which the idea had been improved upon, which he considered may be an explanation of the term "a chest of drawers." In one of the rooms in the roof there is quite a collection of carved woodwork, from various parts of the house, most of which was almost hidden under successive coats of paint; these have since been carefully removed and the original sharpness of the carving restored. On leaving, the attention of the visitors was drawn to the front door, the workmanship of which shows that the art of "mitreing" the mouldings surrounding the panels was well understood by its maker, although in the smaller panelling throughout the house this seems to have been generally shirked, the small mouldings tapering off towards the angles to avoid facing the difficulty. It should be added that the door is of oak, of a very respectable thickness, and the hinges of wrought-iron do not appear too light for their work, although that means the proper support of a door which weighs about 18 cwt.

At half-past five the Cathedral was reached, and the party found Minor Canon Livett a capital guide. After inspecting the work in connexion with the restoration of the west front, now in progress by Mr. Pearson, R.A., a visit was made to Gundulph's Tower, on the north side. This now forms no part of the church; the walls remain to the height of about 30 ft., but the roof has long since vanished. Attention was called to the constant use of tufa as a building material by the early Norman builders, and samples of this stone were pointed out. It is not known where this was obtained from, although it seems probable that it was brought from abroad. On entering the Norman nave, a diagram was exhibited, showing the result of excavations below portions of the west end of the Cathedral, during which the foundations of the apse of the Saxon Church were discovered. A specimen of Gundulph's masonry resembling that in the tower attributed to him at Malling, was then noticed. Under the central tower the peculiarity of the construction was noticed, the fact that the smaller shafts have their bases at such an unusual height being probably explained by the fact that in early times a stone screen extended across the western arch of the tower, similar to the remaining one across the eastern arch, in which is the present entrance to the choir. The nave, thus cut off from the monks' church, was used for parochial services by the secular clergy. After continual disputes the monastery permitted a separate church to be built to the north of their cathedral. Entering the choir, the side walls of which are carried up solid from the back of the stalls, the remains of the early benches were noticed, and also the restored colour decoration, which has been copied from portions which are still preserved. The pattern is a diaper formed by red quatrefoils with the heraldic "lion of England," interspersed with concave diamonds of dark blue, with the golden "fleur de lis," no doubt in allusion to the ancient armorial bearings of the English sovereigns who quartered England and France on their shields.

As the trains for returning to town were somewhat inconvenient as to time, the remainder of the cathedral could not be very minutely examined. The eastern transepts, with the rich chapter-house doorway, and some tombs with good original colour decoration, were noticed. A brief visit was then made to the crypt, which extends under the eastern portion of the church. A few of the party, who were not obliged to leave by the earlier train, were able to inspect the remains of Bishop Ernulph's work in the ruins of the Norman chapter-house, and then bade farewell to their guide.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

ELECTION OF STANDING COMMITTEES AND NEW MEMBERS.

FOR the reason stated by us last week, we were unable to give the results of the election of Standing Committees for the year 1891-92, which were announced at the meeting of the Institute on the 8th inst. We now give them, together with the names of new members:—

The President having opened the four reports of the scrutineers (Messrs. F. R. Farrow, J. S. Hansom, H. W. Pratt, J. S. Quilter, Lacy W. Ridge, and F. Todd, Fellows, and Banister Fletcher, jun., and H. T. Hare, Associates) appointed to direct the election of the Standing Committees, the following announcements were made by him:—

Art Standing Committee.—Fellows (10):—The following candidates are elected: John M. Brydon, 393; R. Herbert Carpenter, F.S.A., 386; John Belcher, 375; Edward J. May, 362; James Neale, F.S.A, 352; Mervyn E. Macartney, B.A, 346; Ernest Newton, 346; W. D. Carüe, M.A., 311; H. L. Florence, 275; and C. Forster Hayward, F.S.A., 253. Associates (6):—The following candidates are elected: E. Ingress Bell, 404; Gerald C. Horsley, 370; Alfred Aitchison, 342; Beresford Pite, 329; Arthur Cawston, 255; and B. Binyon (Ipswich), 235.

Literature Standing Committee.—Fellows (10):—The following candidates are elected: Professor Aitchison, A.R.A., 396; Alexander Graham, F.S.A., 360; John Slater, B.A., 349; J. Alfred Gotch, F.S.A., 333; R. Phené Spiers, F.S.A., 333; David Brandon, F.S.A., 330; Frank T. Baggallay, 316; Charles L. Eastlake, 297; E. P. Loftus Brock, F.S.A., 278; and Mervyn E. Macartney, B.A., 234. Associates (6):—The following candidates are elected: Paul Waterhouse, M.A. Oxon., 397; Arthur Edmund Street, M.A. Oxon., 381; H. O. Cresswell, 341; F. T. Dollman, 318; Thomas Garratt, 313; and R. Elsey Smith, 283.

Practice Standing Committee.—Fellows (10):—The following candidates are elected: Cole A. Adams, 354; Edwin T. Hall, 343; S. Flint Clarkson, 335; Lacy W. Ridge, 319; Joseph S. Hansom, 302; J. Douglass Mathews, 295; G. E. Grayson (Liverpool), 287; H. C. Boyes, 279; G. R. Crickmay, 236; and Stephen Salter, 236. Associates (6):—The following candidates are elected: Thomas M. Rickman, F.S.A., 387; Edmund Woodthorpe, 366; Thomas Batterbury, 324; F. H. A. Hardcastle, 319; W. Hilton Nash, 250; and R. S. Wilkinson, 248.

Science Standing Committee.—Fellows (10):—The following candidates are elected: E. J. Tarver, F.S.A., 372*; Lewis Angell, 353; Thomas W. Cutler, 350; T. H. Watson, 336; J. Douglass Mathews, 327; H. Tanner, 324; Ralph Nevill, F.S.A., 315; Henry Dawson, 309; H. D. Searles-Wood, 307; and B. Tabberer, 302. Associates (6):—The following candidates are elected: Frank S. Granger, M.A., 372; H. A. K. Gribble, 337; William C. Street, 327; Henry Lovegrove, 317; Francis Hooper, 315; and Charles Henman, 307.

Ballot for New Members.—The following candidates were balloted for and declared to be duly elected:—As Fellows (22):—Messrs. John Horbury Hunt (Sydney); Edward John Dodgshun (Leeds); Walter Higginbottom (Manchester); John Donkin (Bournemouth); Francis James Smith; George Halford Fellowes Prynne (*Associate*); Arthur Edmund Street, M.A. (*Associate*); John Edward Knight Cutts (*Associate*); William Charles Street (*Associate*); Frank John Brewer; Charles George Hood Kinnear (Edinburgh); Edward Monson, jun. (*Associate*); Otho Bathurst Peter (*Associate*, Launceston); Latham Augustus Withall; William Frederick Unsworth (*Associate*); Alfred Bovill (*Associate*); Albert Edwin Sawday (*Associate*, Leicester); John William Stanley Burmester; Robert Page; Walter Graves (*Associate*); Thomas Cooke Nicholson (Newcastle-upon-Tyne); and Bernard Smith.

In accordance with clauses (*b*) and (*c*) of By-law 9, the following candidates, who have passed the Examination, were elected by show of hands:—As Associates (19): Messrs. Robert Smith Dods (Brisbane); Edward Carrington Hanson; John Walter Little (Clare, Suffolk); John Begg; Joseph William Twist (South Shields); Henry Jenner Griggs; Stewart Henbest Capper, M.A. (Edinburgh); Edward Howley Sim; Allan John Meacher; George Sydney Jones (Sydney); John Hutchings; John Rawlinson; Thomas Rogers Kitsell (Bury, Lancs.); Walter Thomas Cressall; William Church Howgate; William Lionel Eves; Andrew Noble Prentice; William Fraser; and John Albert Gill Knight.

His Highness the Maharajah of Jeypore, G.C.S.I. (Rajputana), was also elected an Honorary Fellow; and Dr. William Dörpfeld (Athens) and His Excellency Osman Hamdy Bey (Constantinople) were elected Honorary Corresponding Members.

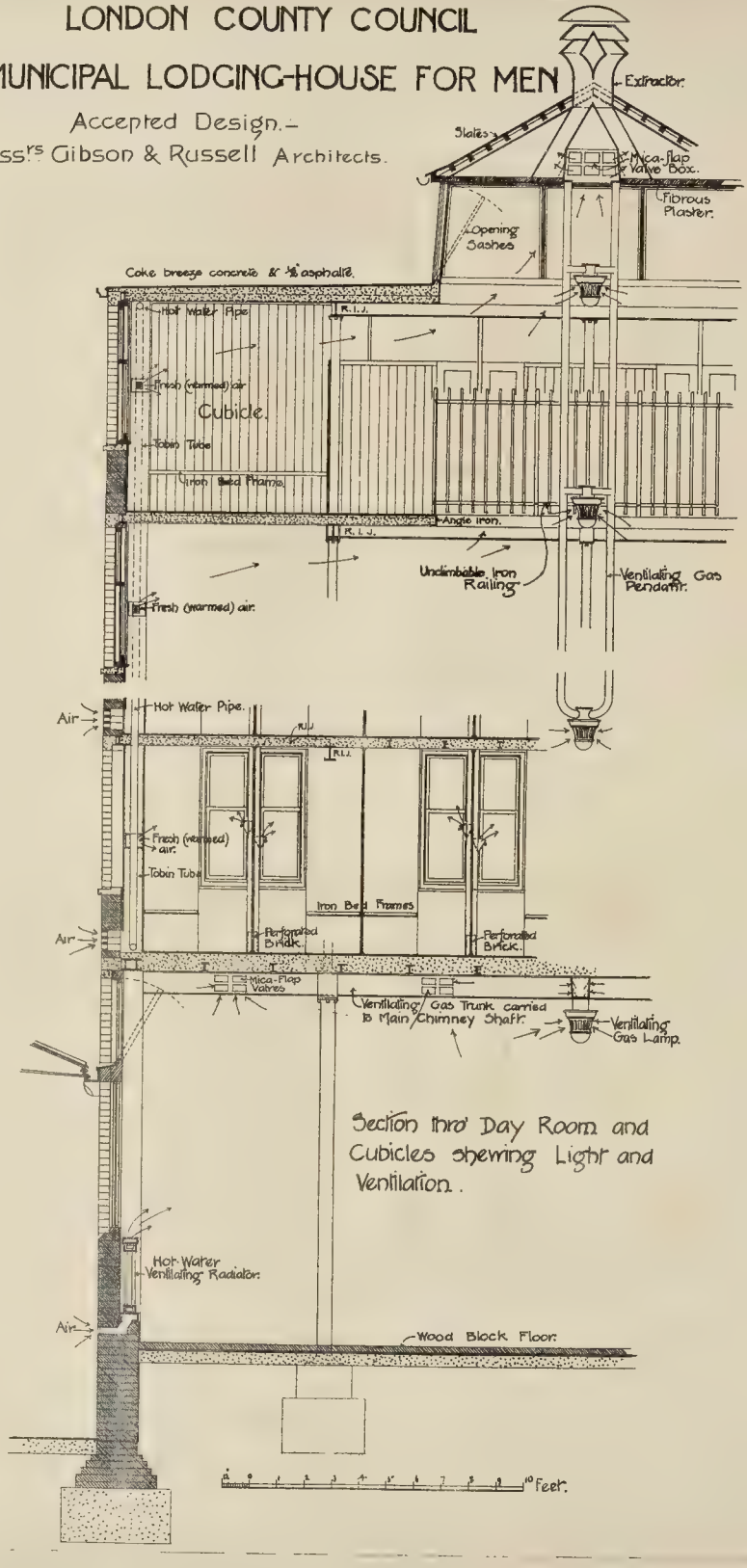
RESTORATION OF WEST BUCKLAND CHURCH, SOMERSET.—The re-opening of West Buckland parish church, after restoration, took place on the 12th inst. The church has been re-seated with pitch-pine benches, the aisles have been laid with encaustic tiles, a new stone pulpit has been constructed, the old western gallery has been removed and the west arch and west window thereby opened up, and the windows have been re-glazed. The interior walls have been re-plastered in stucco, a new vestry has been provided, and the exterior stonework has been restored. The work has been carried out by Mr. H. J. Spiller, of Taunton, and the heating apparatus and the ventilators have been supplied by Messrs. Bishop Brothers, of Wellington, the architect for the work being Mr. E. T. Howard, of Wellington.

* Mr. Tarver's death was, by a sad coincidence, announced at the same meeting.

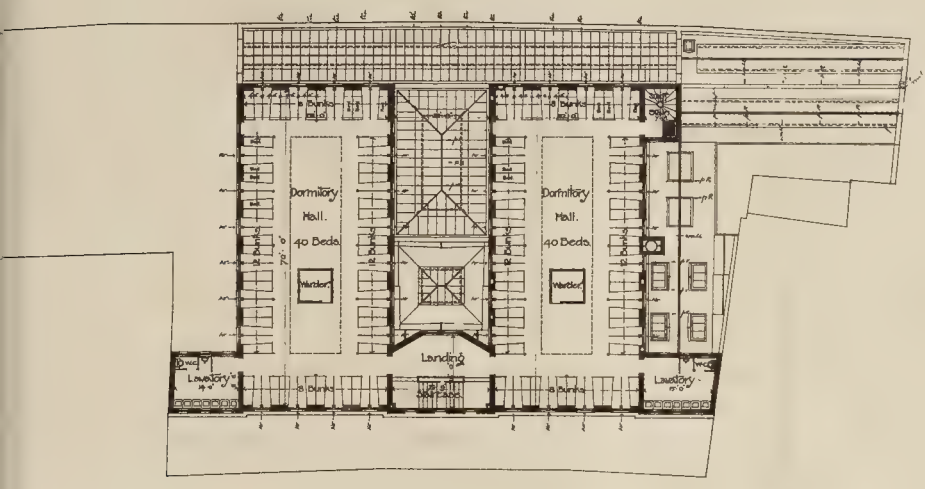
LONDON COUNTY COUNCIL

MUNICIPAL LODGING-HOUSE FOR MEN

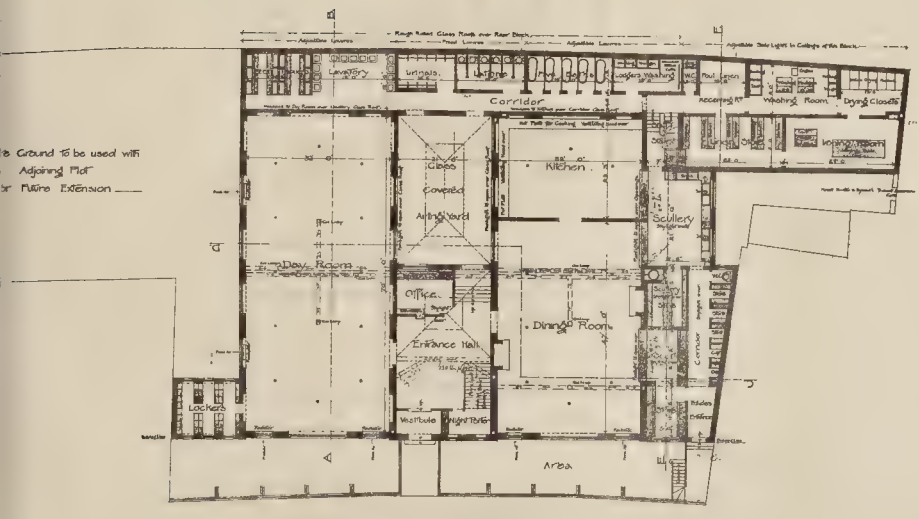
Accepted Design.–
Messrs. Gibson & Russell Architects.



Section thro' Day Room and Cubicles shewing Light and Ventilation.



FIRST FLOOR PLAN



GROUND FLOOR PLAN.

PHOTO-LITHO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.

HE LONDON COUNTY COUNCIL.

E usual weekly meeting of this Council held on Tuesday afternoon at Spring-ens, the Chairman, Sir John Lubbock, pre-g.

ath of Mr. James Beal.—The Chairman other members made feeling reference to death of Councillor James Beal, who regarded as "the father of London muni-l reform," and who has made himself par-arly prominent on the Council as a cham- of the public against the water companies. Council passed a vote of condolence with Beal's family.

w Tenders.—The General Purposes Com-ee reported as follows on this subject:—

The Council, on April 28,* referred it to us to ider and report on the policy of accepting lers when it is apparent that the contractor can carry out the work in an honest and sub-tial manner at a great loss; whether such a cy is contrary to fair and honest trading, and ther it tends to promote sweating, scamping, the use of inferior materials. With the spirit his resolution we entirely concur, and the only stion is, supposing the Council to be in similar ord, what is the best practical course to take? varying circumstances under which tenders are le and accepted seem to us to render any fixed impracticable. The Committees which receive ders, and which have before them the whole of circumstances, are the best judges of what is right course, and as the Council, when adver-ng for tenders, expressly declares that it does bind itself to accept the lowest or any tender, re is nothing to fetter the discretion of a Com-ttee in dealing with all tenders according to their rits. We recommend—

That the Council do concur in this view.'"

Brooke's Market Area, Holborn.—The Housing the Working Classes Committee brought up following report:—

'The attention of your Committee has been ected to an insanitary area known as Brooke's-rket, Holborn. An official representation re-ing to this locality was made to the Metropolitan ard in 1883, but the Board took no action with ard to it, on the ground that it was too small for application of Cross's Act. The area comprises urteen houses and four sheds, and the houses are and in bad repair, with insufficient yard space the rear. Many of them have lately been closed, d the persons who would now be displaced by a arance are only about sixty in number. Your mmittee have communicated with the Holborn strict Board on this subject, in the hope that the ard would see their way to initiate a scheme for construction, but, although they have given the tter their consideration, no conclusion has been me to, and meanwhile the opportunity for dealing th the area promptly is (having regard to the riod of the session) likely to be lost, and before other year has passed the area may have been built upon. The area is about a quarter of an re in extent, and lies centrally between Leather-ne and Gray's Inn-road. It is the centre of a ensing population, and there are many parish and her schools in the immediate vicinity, one of hich actually abuts on the area, which helps to nder it most desirable that rebuilding on the area ould be restricted as far as possible. The extra-dinarily dilapidated condition of the dwellings, any being mere shanties, which occupy the site, d the fact that several have been closed, affords exceptional opportunity for dealing with the ea in such a way as, while rehousing the persons ctually displaced, to provide for the remainder ing left as open space. The scheme which your ommittee propose is framed with this object in ew. The plan shows accommodation for sixty-ur persons in buildings four stories high, con-ructed at one side of the area, the rest of the ea remaining open. As an alternative, the two rojections on the south side of the main buildings ay be carried only three stories high, leaving two ngle-room tenements on the top story, and educing the accommodation from sixty-four to xty persons. In either case the building regula-ons of the Council are observed. The Valuer stimates the net cost of the scheme, exclusive of aving works and the cost of laying out the open pace, at 4,750*l.*; the gross cost being estimated at ,500*l.* and the recoupment at 750*l.* A contribution owards the cost will, of course, be looked for from he District Board. Your Committee recom-end:—

'That, subject to an estimate being submitted by the inance Committee in accordance with the statute, the ouncil do pass a resolution under section 39 (1) *b* of the ousing of the Working Classes Act, 1890, in respect of he Brooke's-market, Holborn area, and do order its seal o be affixed thereto; and do direct a scheme, under art II. of the Act, to be prepared for the improvement f the area; and that your Committee be authorized to repare a scheme accordingly.'

Resolution which the Council is asked to pass nder this recommendation:—

'Resolved,—That it appears to the Council that the closeness, narrowness, bad arrangement, and bad condition of the buildings situate upon the area known as Brooke's-market, in the parish of St. Andrew, Holborn, in the Administrative County of London, delineated and coloured red on the plan annexed to this resolution, and the want of light, air, ventilation, and proper convenience, and other sanitary defects in the said buildings and premises, are dangerous or prejudicial to the health of the inhabitants of the said buildings, and of the neighbouring buildings, and that the demolition, reconstruction, and re-arrangement of the said buildings is necessary to remedy the said evils, and that the area comprising those buildings and premises, and the yards, outhouses, and appurtenances thereof, and the site thereof is too small to be dealt with as an unhealthy area under Part I. of the Housing of the Working Classes Act, 1890, and the Council doth by this resolution direct a scheme to be prepared under Part II. of the said Act for the improvement of the said area.'"

This recommendation led to a long discussion. The proposal of the Housing Committee was strongly condemned by Mr. Hutton, who moved, as an amendment,

"That in the opinion of the Council, it is not desirable to deal with the area in Brooke's-market, Holborn, until further experience has been obtained as to the operation of the Act in relation to the Boundary-street scheme."

Mr. Hutton criticised the scheme as extravagant and ill-considered, and urged that instead of taking up such schemes for the benefit of the slum-owners, the Council ought to take steps to bring the slum-owners before the magistrates and compel them to put their property into sanitary condition.—Mr. Saunders, in seconding the amendment, said that by taking the steps recommended to them by the Housing Committee they would be putting a premium upon the manufacture of slums, and would be making their manufacture a very profitable business to the slum-owners.—Mr. A. Hoare, as a representative of the district, supported the recommendation of the Committee. He contended that the improvement was one which had been long needed, and he denied that anything more than the bare value of the land would be paid, or that the owners of the slum in question would fare better at the hands of the Council than by selling the property in the open market.—On the other hand, Colonel Edis opposed the recommendation of the Committee, and said he did not agree with the Council's valuation of this property, nor with that of the Boundary-street scheme. If they had gone the right way to work, they might have acquired the properties for about half the sum they were proposing to give.—After some further discussion, Mr. Hutton's amendment was carried, on a division, by 45 votes for to 37 against. On this being put as a substantive motion,

Mr. Roberts moved another amendment, to the effect that the report be referred back to the Committee, with a view to ascertain what proportion of the cost the local authority would be willing to bear. Mr. Roberts said that it would be lamentable if the important work of the Housing Committee were to be practically suspended by the passing of such resolutions as Mr. Hutton had succeeded in carrying.—Dr. Longstaffe seconded this amendment, and said that the question involved was neither a slum-owners' nor a working-men's question, as had been said by various speakers, but a question affecting the health of the whole community of London. There were numerous places of this sort which must be got rid of at all cost in the interests of the people of London as a whole. The Artisans' Dwellings Acts were not very appropriately named; they were not merely Acts for housing artisans; they were in a still larger degree Nuisance Removal Acts, which necessarily, unfortunately, entailed operations on a large scale. It was their duty not to shrink from their duty as administrators of those Acts, costly though the work might prove to be.—Mr. Maule said that, as another representative of the district concerned, he felt it right to say that he disagreed with his colleague, Mr. A. Hoare, and that he opposed the scheme of the Committee. There was no need for more artisans' dwellings in the neighbourhood, which was, in fact, over-done with such dwellings.—After some further discussion, Mr. Roberts's amendment was agreed to, on a show of hands, by 34 votes for to 29 against.

The report was therefore referred back, as was also another report from the same Committee referring to the Green-Bank area, Southwark.

Proposed New Theatre in Cockspur-street.—The Report of the Theatres and Music Halls Committee contained the following paragraph:—

"Your Committee on July 23 last considered certain plans for the erection of a theatre on a portion of the site of Waterloo house, No. 2, Cockspur-street, and Nos. 16 and 17, Pall-mall East, which had been sent in by Mr. Emden, architect, acting for Messrs. Hollingstone and Pearce. As the drawings, eleven in number, were deemed unsatisfactory and such as should not be approved, the Committee reported in that sense to the Council on July 29, and their recommendation was adopted.

Amended plans were submitted by Mr. Emden on January 26, 1891, and your Committee considered them, in conjunction with the Superintending Architect's report, on February 11. There appeared, however, to be considerable objections to the site, but before coming to a decision, they asked for a complete block plan of the whole of the buildings immediately surrounding the proposed theatre. This plan was furnished and considered by your Committee on February 25, but as several objections appeared on the face of them, the Superintending Architect was directed to confer with Mr. Emden upon the points at issue. On March 11 the plans were again considered, and your Committee gave instructions that the attention of Mr. Emden should be drawn to the unsatisfactory nature of the proposed exits. The subject was again before the Committee on March 25, April 15 and 29, and June 3 and 10, as various objections to the proposed plans still presented themselves.

The Superintending Architect was, at the wish of the Committee, in constant communication with Mr. Emden, but it was not until June 10 that he was able to report to your Committee that the drawings complied with the requirements of the Council in regard to the construction of theatres.

The Committee have thus given the most careful and earnest consideration to this application, and although they are by no means satisfied that the site is such a one as should meet with approval, they have some hesitation in recommending the rejection of the plans on that ground alone, having regard to the general conditions of the sites upon which it has been the practice to erect theatres in London, and therefore, after carefully weighing all the circumstances of the case, they recommend—

'That the drawings, dated January 26, 1891, as amended by further drawings dated April 11 and June 9, 1891, be approved, and that Mr. Emden be so informed.'"

The consideration of this recommendation was postponed.

After transacting other business, the Council adjourned.

See *Builder* for May 2, p. 355.

COMPETITIONS.

HORNSEY-ROAD BATHS.—We hear that in this competition Mr. A. Hessell Tiltman, of London, has been awarded by the arbitrator (Mr. Chas. Barry) first and second premiums, and that Mr. Tiltman has been duly appointed architect to the work. The baths are to be built for the Commissioners of Baths and Washhouses for the Parish of St. Mary, Islington.

NEW MARKETS, HALIFAX.—Messrs. Leeming & Leeming write (see p. 468 *ante*):—"An error occurs in your description of last week. In naming the limit of cost as 40,000*l.* you infer that our estimate is much less (34,000*l.* odd), the fact being that the estimate named is for the portion of work *first* to be carried out, the total estimate reading 40,000*l.*"

NEW PUBLIC PARK AT CHESTERFIELD.—We are informed that Messrs. William Barron & Son, landscape gardeners, of Borrowash, have been awarded the first premium for their designs for laying out Queen's Park, Chesterfield. The park is 22½ acres in extent, and was purchased by public subscription to commemorate the Queen's Jubilee. An ornamental lake, cricket and football ground, bicycle track, bowling green, gymnasiums, &c., are provided in Messrs. Barron's scheme.

QUEENSLAND INSTITUTE OF ARCHITECTS.—The first competition amongst architectural students, conducted by the Queensland Institute of Architects, has terminated very satisfactorily, and evinces an amount of talent in our architectural pupils that the members of the Institute were scarcely prepared for. The designs called were for museum and art gallery, for which premiums offered by the Institute are—First design, gold medal, value 10*l.*, and the President's prize of books to value of 5*l.* 5s.; second premium, 5*l.* 5s. The awards made are—First place motto, "Au Hasard," H. A. Crouch, articled to Mr. Buckeridge; second, "Carbine," G. G. Hutton, in the office of Messrs. Oakden, Addison, & Kemp. A special prize of the Institute's silver medal, value 5*l.* 5s., is awarded to "Bibliothèque." E. J. Clarke, in the office of Mr. J. J. Clarke, for merits in plans and excellency of drawings. Competitive designs were also invited from younger students for a terrace of five houses. The prizes awarded for these are—First, "Lux Mundi," J. Barr (Oakden, Addison, & Kemp), prize value 5*l.* 5s.; second, to "Rex," T. F. M. Stanley (F. D. G. Stanley), 3*l.* 3s.—*Brisbane Courier* (April 28).

Illustrations.

SHEFFIELD MUNICIPAL BUILDINGS: PRINCIPAL ENTRANCE.

THIS drawing, which is now in the Architectural Room at the Royal Academy, shows the detail of the main entrance to the new Municipal Buildings at Sheffield, by Mr. E. W. Mountford. A somewhat important alteration has been made in the design at this point, since the general drawing was made; a single large arch over the doorway has replaced the two arches which were in the original design. The change is certainly an improvement.

PROPOSED BELL-TOWER, ST. MICHAEL'S CHURCH, COVENTRY.

THE proposed tower is in the early Perpendicular style, and at the ground level measures 36 ft. across the walls, and 50 ft. over the buttresses; each angle has two buttresses, which have their inner angles strengthened by octagonal faces, which are a continuation of the faces of the turrets which crown the tower. There are also central buttresses on each face, so that the tower has twelve buttresses in all.

The tower would be placed parallel with the avenue, so that the archway would be at right angles to it.

The lower stage of the tower, up the first string-course, a height of 56 ft., would be almost quite plain, excepting for the base-course, which is 6 ft. high, and of three moulded tiers, the upper one of which is enriched with a continuous panelling.

Two single-light windows on the north-east and west faces light the lower chambers, the walls at this point being 7 ft. thick.

Above this chamber is the new vestry, 22 ft. square internally, and lighted by two-light windows on its east and west sides, direct access being obtained to this room by means of a turret staircase provided on the west side of the cloister, which latter connects the tower directly with the Girdler's Chapel. This cloister is groined in three bays, and is 16 ft. wide; a flight of steps would lead from its level to the level of the church floor, as occurs in other entrances of the church, one-half of the steps being in the cloister, and the other half in the Girdler's Chapel.

No ancient feature of the Church of St. Michael would be disturbed by the erection of the cloister.

The main staircase to the tower, for ringers, &c., is in its south-east angle. The next stage of the tower provides the ringers' room, 22 ft. square and 21 ft. 6 in. from string-course to string-course, with chamber for the clock-machinery immediately above it. The external face of the tower at this point has a little more ornamentation, so as to lead up to the greater richness of the belfry-stage, the four principal Archangels being sculptured in panels on the east and west faces, the north and south sides having double windows for lighting the ringing-room.

The chamber for the bells follows next, 22 ft. square internally, and 37 ft. 9 in. in height from string-course to string-course, with walls 6 ft. 6 in. thick, the windows being in two thicknesses, detached from each other, so as to afford deep recesses, which are enriched by detached tracery at their head, and by a pierced parapet at their sill-level. The next arcaded stage, 14 ft. high, which is also in two thicknesses, is intended to receive the clock-dials, which latter would be of the skeleton type and gilded, being at their centre at a height of 122 ft. from the ground. The tower is finished with a rich traceried parapet, 8 ft. 9 in. high, and having four pinnacles, 30 ft. 6 in. high. The total height from ground to top of parapet is 138 ft., and from ground to top of pinnacles 168 ft. 6 in.

It is proposed that the sculptured figures which have been introduced in the octagonal faces of belfry and clock stages as a feature in common with the present tower of St. Michael's Church, might represent the several orders of angels, and the Latin inscription to be carved on the cornice from Psalm ciii., 20, continues the idea.

> Benedicite Domino omnes angeli ejus.
> Potentes virtute facientes verbum illum,
> Benedicite Domino omnes virtute ejus.
> Ministri ejus qui facilis voluntatem ejus.

One line of the text being placed on each side of the tower.

The central spirelet is intended to be quite unobtrusive, and may be described as being simply a base or strengthening of the vane rod; it would be covered with lead, with leaden crockets at its angles.

The design is by Messrs. Paley & Austin, of Lancaster.

LONDON COUNTY COUNCIL MUNICIPAL LODGING HOUSE.

WE give this week illustrations of the selected plans for the new Lodging House for men, by Messrs. Gibson & Russel, about to be erected by the London County Council on the site recently purchased and cleared in the neighbourhood of Drury-lane. The following extract from the architects' report sufficiently explains the plans:—

"In our design the dormitories govern the general disposition of the building, for we consider that in buildings of this class they are of primary importance, seeing that they are the parts which the inmates use during the longest periods; therefore thorough ventilation with a constant supply of fresh air to each sleeper is essential.

We presume that it is open to us to set forth concisely the merits of our scheme, and to compare it with similar buildings already erected. It is beside the question to discuss the ordinary East-end lodging-house or the existing Salvation Army shelters, which, from our personal knowledge, would certainly not serve as models. We turn, therefore, to the type from which those at Glasgow have been erected, as being the most recent buildings of this class.

The dormitories in these are arranged on the old infirmary system, and are filled with cubicles in such a way as to destroy all natural ventilation. The current passing over the top of each cubicle is supposed, by suction, to change the air therein, but in reality each compartment is a well-hole filled with foul air. This evil is further aggravated through placing one sleeper over another, by which the unfortunate occupant of the lower berth, beside being cramped in all his movements, is in an atmosphere which is practically unchanged during the night.

In our design—two halls, each 70 ft. by 32 ft., with three tiers of galleries, ranging round a central well, form the dormitories, giving 435 cubic feet of air space to each sleeper.

In these galleries, and adjoining the external walls, are placed cubicles, each measuring 6 ft. 6 in. by 4 ft. by 7 ft. 7 in. high. Every cubicle has a double-hung sash window, 4 ft. 9 in. by 1 ft. 9 in. These windows are arranged in pairs, with a fresh-air inlet in the breast of each at the floor-level, which supplies a current that flows over a low-pressure hot-water pipe, encased in a box at the back of each mullion. This current (warmed in cold weather) is admitted into each cubicle at a height of about 4 ft. 6 in. through a perforated hinged flap, ensuring a constant supply, which the occupant can increase at pleasure.

The divisions between the cubicles are carried up to the ceilings, while the ends next the galleries are 5 ft. 6 in. high, leaving an open space of 20 in. to ensure a current from the air inlets to the central well, from the roof of which the foul air is extracted.

Each cubicle is quite private, and has a door provided with a bolt on the inside, which can be opened from the outside with a master key.

The beds, framed of angle iron, are tapered to increase the floor space, and each sleeper is placed with his feet towards the window, so that his head may be away from the draught caused by the window, if open.

The galleries have an unclimbable iron railing 4 ft. 6 in. high surrounding the central well, which is lighted by a 'cabin' roof-light with opening sashes for ventilation in warm weather. The ventilating gas-pendants discharge into extract ventilators over, with mica-flap boxes to prevent down-draught, which ensure ample ventilation at other seasons.

Each gallery is provided with a lavatory block separated from the main building, containing also one w.c. and urinal for night use.

A box for a warder, from whence he can command the entire dormitory, is placed in each hall.

The dormitory halls are approached by a staircase 6 ft. wide, which rises from the entrance-hall and gives access to each gallery, and a staff staircase and lift for linen, &c., are provided in addition to economise labour.

The only parts of the building placed in the basement are the caretaker's house, which complies with the conditions, the disinfecting-chamber, ample coal stores, and heating apparatus.

On the ground-floor a central entrance-hall from Parker-street gives access to the various parts of the building.

Facing the entrance and staircase is placed the office, which adjoins the day-room, and overlooks the dining-room. These two rooms enter left and right from the hall. The day-room, 70 ft. by 32 ft., with a floor space of 7 square feet to each person, gives ample accommodation for entertainments, &c. The efficient lighting and ventilation of this room is assured by means of windows on all sides. A small room, fitted with lockers for the use of 'regulars,' adjoins this room.

The dining-room, 47 ft. by 32 ft., is provided with two large, open fireplaces, and communicates with the kitchen, 32 ft. by 22 ft., which has a hot-plate 50 ft. in length for cooking. The scullery, 21 ft. by 14 ft., with its store, 11 ft. by 9 ft., adjoins these rooms, and a counter is conveniently placed for the serving and receiving of utensils. The grocery-bar, with its store, is placed next the dining-room, and is provided with a counter.

A side entrance for tradesmen and staff is provided, together with a separate entrance for caretaker from the front area. A small stair from his house gives access to the night-porter's box in the entrance-hall.

The laundry block is placed in the rear right-hand corner of the site, and is a building of one floor only, designed to preserve the lights and easements of Messrs. Hunter & Hyland's premises. It consists of receiving-room, washing-room, drying-room, with closets, ironing-room, and linen store, which serves the lift communicating with the dormitories. This block is distinct from the main building, but a door communicates with the rear public corridor, so that lodgers who require washing done may there hand it in.

A glass-covered exercise-yard, 33 ft. by 21 ft., is placed behind the entrance-hall, and leads to the conveniences for day use, which are entirely isolated from and placed in the rear of the main buildings. These conveniencies comprise lavatory, latrine, urinals, troughs for feet washing, baths, and lodgers washing and drying rooms.

Lighting, Heating, and Ventilation.

These details are kept as simple as possible, and full advantage is taken of natural means of ventilation wherever practicable.

The day-room has windows on all sides, some double-hung, and those over the roof of the yard hinged to fall inwards.

The natural ventilation of the dining-room and kitchen is similar to the above, these having windows on three sides.

In addition to the windows, fresh air is admitted to these rooms through perforated bricks at the floor level, this, in cold weather, is warmed before entering the rooms by passing through a hot-water radiator.

The foul air, and products of gas combustion, are drawn into ventilating trunks in the ceiling, and taken into the outer casing of the main chimney-shaft.

Ventilating hoods are placed over the hot-plates in the kitchen to draw off the heated air and fumes, and wherever practicable, throughout, mica-flap valves are inserted in the flues to assist in exhausting the vitiated air.

In the dormitories fresh air is admitted through perforated bricks at each gallery floor-level into a wooden vertical tube, enclosing a 3 in. low-pressure hot-water pipe, which extends the whole height o the dormitories, while the tube is sealed at each floor-level. The external air, after impinging on this pipe, is admitted into the cubicles through adjustable perforated hinged flaps, about 4 ft. 6 in. above the floor-level. Since these flaps are perforated, a certain minimum quantity of air must pass through, and this can be increased at the pleasure of the occupant.

The central wells are ventilated by means of opening sashes in the roof-lights, and over each gas-pendant is placed an "extractor," with mica-flap valve boxes to prevent down-draught.

Through these means a constant change of air is effected in such a way that no inconvenience will be felt by the inmates.

Materials.

The wall generally are built with hard selected stocks. Glazed brown bricks are used on the front elevation up to first floor level, and red brick quoins to the angles and window reveals above. It would be advisable to use white glazed bricks throughout, but the limit fixed to the cost renders this impossible; the internal walls, therefore, are rendered in Portland cement brought to a smooth surface, and left in its natural colour.

Coke breeze concrete for fireproof flooring is adopted throughout on account of its lightness, efficiency, and economy, and concrete lintels are used for window and other openings, with the exception of the Parker-street front.

The flooring to day-rooms and hall is wood-block, of the school-board type, while the kitchen and all other floors are floated in cement.

The staircases are shown to be constructed of Wilkinson's ironstone concrete, though, preferably, with the sanction of the County Council, steps of solid hard wood would be used as being more fire-resisting.

The joinery throughout is yellow deal, and the iron-work shown on detail, etc., from approved firms.

The glass roofing is formed with Hartley's rough rolled plate.

Though not absolutely fire-proof, the structure throughout would be eminently fire-resisting.





SHEFFIELD MUNICIPAL BUILDINGS: PRINCIPAL ENTRANCE.—Mr. E. W Mountford, F R I B A Architect

No. 1873, Royal Academy Exhibition, 1891



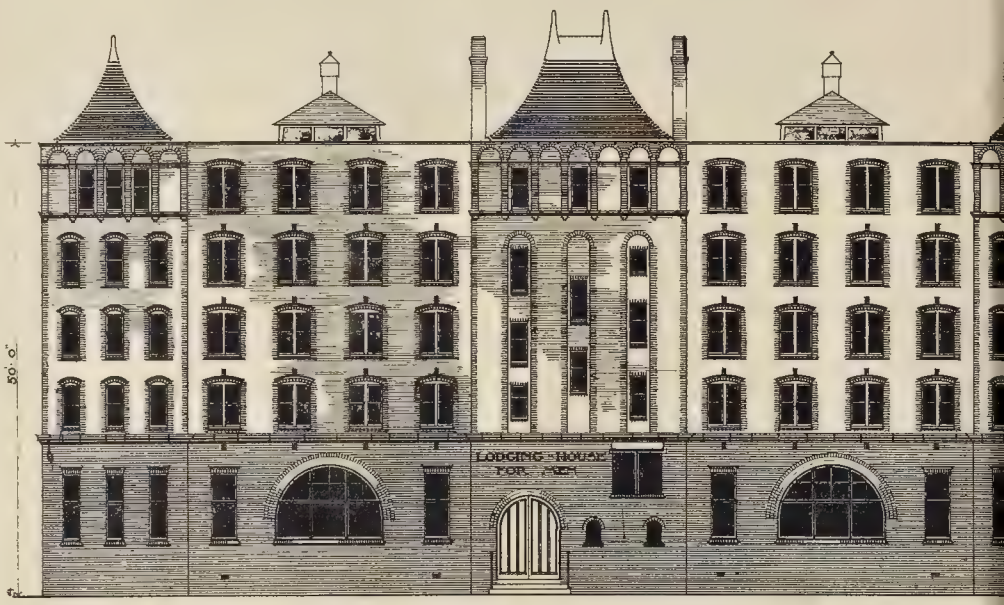
PROPOSED NEW BELL-TOWER, ST MICHAEL'S, COVENTRY.—Messrs PALEY & AUSTIN, ARCHITECTS

(View showing grouping of new Tower with two of the ancient Coventry Spires.)



PROPOSED NEW BELL-TOWER, ST MICHAEL'S, COVENTRY.—Messrs Paley & Austin, Architects

LONDON COUNTY COUNCIL MUNIC



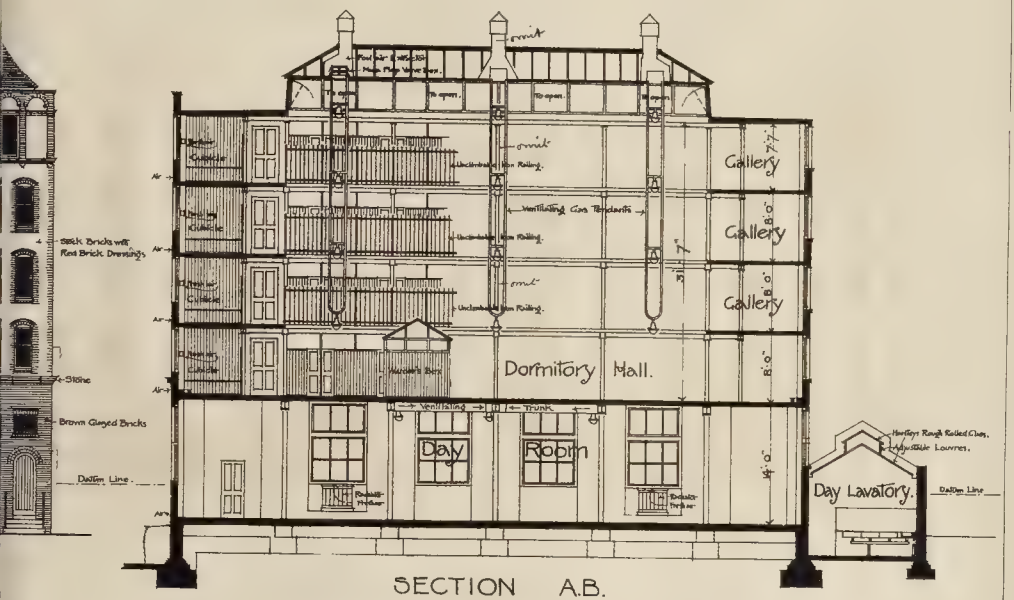
ELEVATION TO PARKER ST.



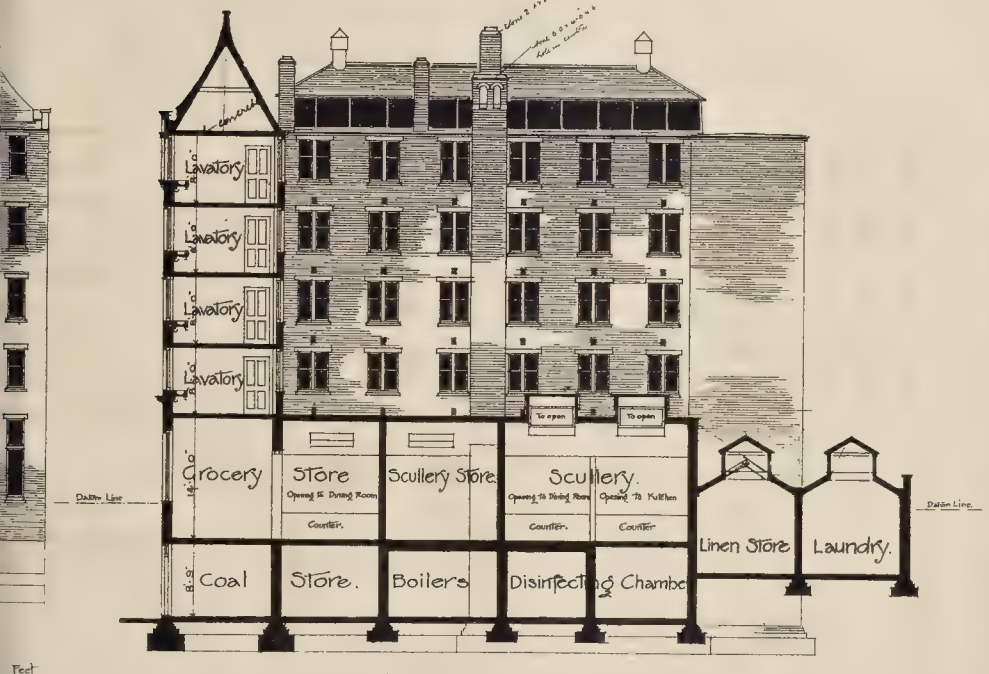
SECTION C D.

L LODGING-HOUSE FOR MEN

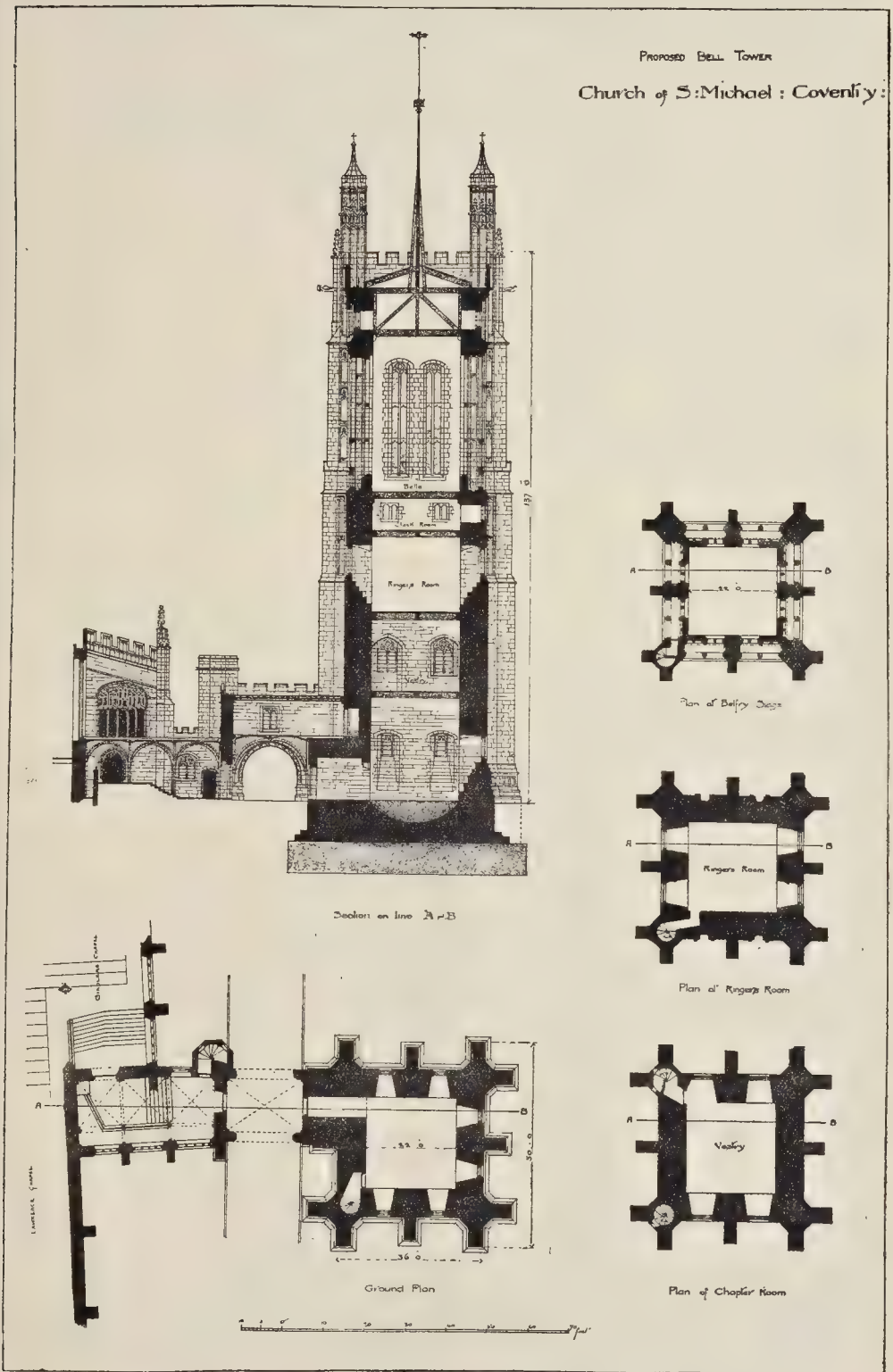
Accepted Design.– Messrs Gibson & Russell Architects



SECTION A.B.



SECTION E.F.



Proposed Bell-Tower, St. Michael's, Coventry. Messrs. Paley & Austin, Architects. Section and Plans.

Sanitary Appliances and Drainage.

In all cases, the flushing of closets and urinals is automatic. The latrine is fitted with Adams's trough closet, but privacy is secured to each user. The urinal also is fitted with Adams's continuous cradle urinal, with slate divisions. The w.c.'s for night use are Bolding's 'Kenon' pedestal closets, which appears to be the best form of pedestal closet, and a valve closet cannot be automatically flushed. The urinals for dormitories are Bolding's 'Station' urinals.

Adams's lavatory (McMath and Adams's patent) is used throughout, so that the supply is under the control of an attendant, and in the lavatory for day use one range of four basins can be left always flowing if desired.

The troughs for the feet washing, to which hot water is laid on, are deep stoneware sinks with plug and chain.

The baths are independent, beaded or semi-Roman.

In the drainage, which the plan sufficiently explains, the rain-water and waste are kept entirely distinct from the soil drains.

The net cubical contents of the building carefully measured amount to 380,310 feet, which allows of a cost of about 6½d. per cubic foot, a price for which it is confidently stated the work could be carried out in a thorough, efficient, and satisfactory manner."

SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS.

THE fourteenth annual meeting of this Society was held last week in the old hall of Barnard's Inn, Holborn, under the presidency of Mr. Philip Webb, who moved the adoption of the Annual Report.

The report commences with the following paragraphs, headed "Alexandrinism":—

"The Society for the Protection of Ancient Buildings has not neglected the opportunities which have sometimes been given of illustrating the mischiefs of 'restoration' by reference to its results in other arts than that of architecture. It has reminded architects that no one thinks now of restoring a picture or a statue, though that was a thing of which no one doubted the propriety a few years ago. It has pointed out that historical records are now edited from a point of view quite different to that which sought formerly to make them more useful by emendations and corrections, and that in all departments of literature which may be called historical, the editing of old authors, for example, it is now acknowledged that to present them as they are found, even with their faults, is better than to correct them by modern standards; and it asks why works of architecture should be less scrupulously dealt with than a painting, a statue, or a manuscript. It is one of the difficulties in the case that the answer which seems so natural should be hindered by considerations which attach to architecture more than to the other arts. It is the art which is most nearly connected with the necessities of life, and it is, therefore, the one in which people do not feel themselves at liberty to follow their inclination so freely as they may in dealing with the antiquity of a document or the authenticity of a picture. The difficulty is no doubt great, but it is less so than people who are unfamiliar with the resources of the builder are apt to imagine. The Committee, in the face of this difficulty, while unable to give to the Members of the Society the professional knowledge required to meet the technical arguments of the restorer and rebuilder, feels the more bound to strengthen in them the repugnance it endeavours to create towards all changes and so-called 'restorations' of ancient buildings by arguments drawn from cognate subjects within the knowledge of all thoughtful and educated persons.

The following extracts from a very able address delivered by Mr. Emile Faguet, at the opening of his course of lectures on French Poetry at the Sorbonne this year, will help the reader to appreciate this question of the possibility or not of reproducing any particular phase of art which was developed under conditions and influences quite different to those which surround its 'revival.'

The subject of Mr. Faguet's address is 'French Humanism in the Sixteenth Century.' The development of this form of literature coincided with the 'renaissance' of the the art literature of Greece and Rome; it was part of it, but, as respects the greater Humanists at least, those of whom Ronsard is the type, it was not merely a revival, it was a *revolt* against the poverty, the emptiness, of the poetry of the Courts of François I. and Henri II. French literature had degenerated since the early fourteenth century. It had become in the sixteenth century a sort of personal accomplishment, often very frivolous and very shallow, without pith or substance. It had lost all character of nationality. Ronsard and the Humanists proposed to revive it by inspiring themselves at new sources, by adopting new themes and new processes, by the contact of other minds. They excited themselves by the translation of ancient poets. They made for themselves a sort of tradition to replace the lost voice of the native muse.

'"Vetus fit animus," said Livy, in retracing the exploits and the virtues of his great ancestors. This was also the motto of the Humanists, ... provoking in them a sort of *suggestion* across the gap of the ages."

The parallel is evident between this state of things and that of English architecture fifty years ago. Like the Humanists of the fifteenth century, our architects sought to reproduce the fertility and beauty of better times by the simple process of imitation.

Both experiments had a certain success, though not of the kind intended. Architecture is better understood after the minute study of so many different schools. Literature gained also in having a wider horizon, in learning to speak the language of men of another race, and in the effort to assimilate and reproduce the beauty conceived in other minds. It became less provincial, more human. But there were grave disadvantages. The people not being Humanist, Humanism was never popular, and never can be, and as it does not address itself to the mass it also receives nothing from it. This is very important, says Mr. Faguet, for the subject of this essay. It is much more so for the art with which we have to compare it. The architect depends for his success on the intelligent collaboration of many associates: he can only speak and act through them. His art is the least personal of all. The writer may shut himself in his study, and, by force of constant companionship with books, may so saturate himself with the ideas and the mannerisms of his model that he becomes almost of the school; but the architect who proceeds in that way, finds, to his misfortune, that the more he leaves behind him the world in which he lives, the farther he is from the help he needs. In literature, Humanism is to a certain extent possible, though, as Mr. Faguet shows, its ideal is never attained. In architecture, it is a mere dream, absolutely impracticable. But we must here give Mr. Faguet's own words. He does not speak of architecture, be it always understood, but his demonstration leads unavoidably to the conclusion we have drawn in this parallel between the art he is speaking of and that which is more interesting to us:—

'What, then, is Humanism in detail, when analysed minutely? It is, in the first place, the effort to understand and to imitate, to the best of one's ability, the great literary artists of past times. In its first stage, Humanism is an intelligent and ingenious exercise, profitable, perhaps, to the student, but not very fruitful. It is, to call it by its true name, Alexandrinism. There existed at Alexandria, about 300 years B.C., a group of clever writers who studied passionately the old Greek poetry, and forced themselves to imitate its forms, the versification, the phraseology even, hoping thereby to acquire the Greek method of composition, the style, the art. This school became distinguished, its productions were elegant, learned, but rarely great,—or, if some members of it arrived at greatness, it was rather by forgetfulness of their principles in moments of relaxation, of amusement, when they deserted for a time their school, and presented themselves in their proper nature; in their more serious work they acted as if art were nothing but art which may be taught and learnt,—which may be imitated, therefore, and after it has ceased to exist in one place be reproduced in another. It is something less mechanical than this. It is ourselves, in the very depth of our being. It is our mode of thought and perception, the cast of our minds. It is possible to imitate the fashion of our wording, our modes of expression, not the pathos of the voice. Alexandrinism is, then, a heresy, very ingenious and brilliant, but at bottom nothing but the art of *pastiche* taken seriously. There is Alexandrinism in all Humanism. It is seen in the Latin poets who imitate the Greek; it is in Catullus, Tibullus, and Propertius. It is found even in Horace and Virgil; it is in the French poets of the seventeenth century, in Malherbe and in Racine; it is, of course, in Ronsard, and in all his school.

Still Alexandrinism is but the form, I will not say the commonplace, but the elementary form of Humanism. In its deeper, more thoughtful, more ardent aspirations Humanism is better than that. It is a kind of artificial atavism. The Humanist feels the vanity of the Alexandrine that he is in part. He feels the frivolity,—the honourable frivolity if you will, but still the frivolity,—of the man who sees in art nothing but certain fashions, processes, which he has but to study to make his own. He says to himself that of this revived antiquity it is not the art he needs, but the soul; that he must live in his thoughts, with its sentiments, with its faith; that he must have the temperament and the disposition of the artists of past times; that he must revive them in himself if he would do what they did. And this is not so far from the truth. If art is our inmost soul, ancient art is the soul of past times, and if that art is all perfection the first step towards its reproduction is to acquire the spirit of the past.'

Which is as much as to say that the reproduction of ancient art is impossible, since under no possible circumstances is it likely that the soul of the past can live again. That was for each epoch the result of many causes acting with and upon each other, of social conditions, of modes of thought, of national influences even, none of which are likely to repeat themselves; certainly they will never again be found in operation together. The student of antiquity may, then, discipline himself according to the temper of the time he so much admires; he may to a certain extent live in the past; but there is always his other self, the product of the time in which he works, and there is always the influence upon himself and his work of the modern world, enough to give the stamp of modernity to his most cunning 'revivals.' Archæological studies are delightful, but they are of no use to the artist, except to show him that the art he studies has always been one, that its manifestations only have changed, and that *the changes are essential conditions of its existence*, since they represent the relations of his art, and the ever-changing conditions of life.

If, then, art is a thing of changing expressions, what place has the 'restorer' in literature or in architecture? He is an anachronism while living in the nineteenth century; he would fain be of the thirteenth or the sixteenth. He is also a foredoomed failure. He aims at suppressing his own time, and the irrepressible 'present' is always with him. He talks of revivals, and his work is but the lifeless cast of dead forms of art. 'The true Humanist,' says Faguet, 'is of his time.' He is 'himself' . . . . 'after having taken pains to be something else, after having greatly enlarged and enriched his personality;' and he laughs gently at the Alexandrine, whose ideas are those he has borrowed, whose manner even is that of his predecessor, who studies only to be 'correct.'

'Pour mon Œdipe Roi,' said Voltaire, 'j'ai consulté Monsieur Dacier, qui est du pays.' Voltaire was then very young, fresh from his studies of Greek literature, and he had the ambition to write an Œdipe which should avoid the faults of Sophocles and Corneille! M. Dacier advised the restoration of the chorus. Voltaire had the sense to see that this was like advising him to walk about Paris in the costume of Plato; he, nevertheless, introduced the chorus, impelled, perhaps, by the new development which Alexandrinism was then taking, and which, thirty years later, banished paniers and full-bottom wigs from the representations of Corneille and Racine. The theatre very properly led the way in this last effort of the school, which is, after all, but an affair of costume, of dresses and decorations. In literature its most noticeable result has been the historical novel; in architecture, the pride of knowledge has betrayed us into the hopeless attempt to reconstitute our ancient buildings such as they were at some earlier period of their existence. We can put on our bookshelves the curious illustration of ancient manners which we once found so interesting. We cannot so easily dispose of the terrible essays in solid stone and timber which the Alexandrine architect has produced wherever an ancient building offered a field for his ingenuity. These will remain a constant unalterable regret to us and to our children.

It is always in the hope that something may still be saved of the beautiful art of the past that the Society presses this question of 'restoration.' It has to thank the eminent critic from whose very able discourse it has, in great part, condensed this new argument for the opportunity he has given it of presenting a parallel between the revival of architecture in the nineteenth century, and that other revival which amused for a time the *littérateurs* of Alexandria."

The report then goes on to recount the Society's interference, and some of the results, with regard to various buildings in course of "restoration" or removal or proposed to be "restored" or removed.

The motion for the adoption of the report was seconded by Mr. Philip Norman and agreed to.

Mr. W. B. Richmond, A.R.A., then delivered an address on "The Impossibility of Restoration." He said that restoration was a fallacy; they could not bring history back to life again. No man could repeat the thought of another man; it had died with its life. Each special thought through which had been produced a work of art had died in the production of it; the result lived. It had been an isolated thought for the time being, belonging to the individual who conceived it, and it was gone for ever except in his transmission of it. In all great works of art the merits were of so delicate a nature as to be, he believed, scarcely perceptible to any one but the authors of them. They alone knew at what they aimed; they alone were aware of the fine line which divided their achievements from the commonplace. Subtle proportions, delicate curves and turns, a peculiar handling of the brush or use of the chisel special to their work, were as much a part of the conception as the conception was a part of the artist. To arrest the progress of decay was all the preserver would presume to do; but the destroyer would attempt to restore. We knew too much and we knew too little to cast our minds in the moulds of past generations, even if by any natural process it were possible to do so. What had been already taken away from British architecture could never be replaced, for it had been, as it were, a series of murders of artistic creations, a general slaughter of historical associations never to be replaced, or mourned over sufficiently. War and men's passions had done their worst to rid the world of treasures, but so-called restoration had, indeed, done nearly, if not quite, as much; it had left England well nigh bare of her finest monuments.

Correspondence.

To the Editor of THE BUILDER.

KIRKSTALL ABBEY.

SIR,—As I am responsible, and not Mr. Micklethwaite, for the removal of the ivy, hrubs, trees, and vegetation at Kirkstall, and ot only there but at Fountains, and other bbeys as well, I should be much obliged if Mr. Benwell [p. 456, *ante*] will give me a few xamples where the growth of ivy and trees has ided in preserving old ruins.

I am pleased to hear that through the inter- ention of the late Lord Edward Cavendish he whole of the ivy has been also cleared off he ruins of Furness Abbey, and a little judi- ious pointing done.

May such good deeds be done elsewhere!

W. H. ST. JOHN HOPE.

TECHNICAL EDUCATION.

SIR,—In reply to your editorial foot-note in your last issue, in which you say that, if I claim priority for my curriculum, you would point out that the (rejected) scheme appeared in the same number of the *A.A. Notes* as chronicled my appointment to the Chair at King's College, the amusing conclusion being, because the *A.A. Notes* had not previously chronicled my appointment I could not have been previously elected. Pardon my mentioning that the conclusion is fallacious. I was appointed to the Chair as early as March 14.

BANISTER FLETCHER.

*** That is to say, Professor Fletcher was appointed six weeks before the formal publication of the Association scheme in *A.A. Notes*, the said scheme having been first considered two years before, and put into practically its present form one year ago, so that Professor Fletcher's claim for priority cannot count for much. The use of the word "rejected," in regard to the Association scheme, is hardly correct, and was not used by us, as the reader of this letter might infer; the scheme was not "rejected"; certain alterations in the rules of the Association, which were necessary for its working, were objected to, and the whole question was postponed pending the consideration of the alteration of rules.—ED.

BLACKBURN AND EAST LANCASHIRE INFIRMARY NURSES' HOME COMPETITION.

SIR,—The Board of Management of the Blackburn and East Lancashire Infirmary have advertised inviting architects practising in the district served by the charity to send in competitive designs for a proposed new nurses' home, to cost about 3,500*l.* The conditions, which we are assured have been drawn up by the gentleman who is to act as professional assessor, contain the following clause:—"A professional assessor will be appointed, and upon his recommendation, 30*l.* premium will be paid to the author of the best design, which will become the property of the Committee, but he will not necessarily be entrusted to carry out the work. Should the successful competitor be afterwards appointed architect, the premium will then merge into and be a part of the commission." This professional assessor is a F.R.I.B.A. We cannot imagine that any self-respecting architect will be willing to compete under such a clause as the above, and run the risk for the sum offered, which is little more than one-third of the proper remuneration for the work required, of having to relegate the carrying out of his design to some other person. We think that if architects of the standing of the F.R.I.B.A. in question are ready to approve of such a clause as the above in competition conditions, there is but slight chance of the improvement so much to be desired in architectural competition.

STONES & GRADWELL.

10, Richmond-terrace, Blackburn.

THE "WINTON" VENTILATOR.

SIR,—Can any of your readers tell me anything about the "Winton" ventilator? Where can it be got?

J. PRESTON BELL.

DRAINAGE WORKS, PAISLEY.—On the 8th inst., at a meeting of the Police Commissioners, Bailie Brough presiding, a joint report was submitted by Mr. Robert Sharp (Burgh Master of Works) and Mr. Copeland, C.E., Glasgow, in regard to the arrangements prepared for the carrying out of the drainage scheme No. 4, which embraces those portions of the town not already drained. The cost of the scheme is estimated at 13,500*l.*, with an additional 1,555*l.* as applicable to district No. 3. The probable yearly expense for the maintenance of the scheme would be about 1 per cent. of the entire cost. Ex-Bailie Paton moved the adoption of the report. Mr. Robert M'Farlane seconded, and the motion was agreed to.

The Student's Column.

VENTILATION AND WARMING.—XXIV.

PRACTICAL APPLICATION AND CALCULATIONS.

TO illustrate the practical application of the principles of both ventilation and warming, and the method of making the necessary calculations, we will take a simple example, and follow the line of investigation that should be taken.

Let us suppose that we wish to ventilate a meeting-hall in a suburban district, which is used for various purposes—concerts, political meetings, dances, bazaars, &c.

The size of our hall is 80 ft. by 35 ft., and 24 ft. average height; it is seated with chairs for 400 persons, and is to be lighted at night by gas.

The first point to be settled is the extent of ventilation we shall provide. For some of the uses of the hall there will undoubtedly be fewer than 400 persons in it, while it is possible that on occasions there may be more. We should, therefore, take the number 400 as our starting point, and provide an ample supply of air for this number. Referring to Chapter I., we see that 3,000 cubic feet per hour for each person would be ample, even allowing for overcrowding. We have also to allow for the pollution by the gas lighting. This we can calculate at 1,000 cubic feet for each of the 300 cubic feet of gas burnt in an hour. We have, therefore,

$$\begin{aligned} 400 \times 3{,}000 &= 1{,}200{,}000 \\ 300 \times 1{,}000 &= 300{,}000 \\ \hline & 1{,}500{,}000 \text{ cubic feet} \end{aligned}$$

of fresh air required hourly, or 416 cubic feet per second.

In Chapter III. we saw that the rate of the incoming fresh air should not exceed 2 ft. per second. We have, therefore, $416 \div 2 = 208$ ft. for the superficial area of our inlets. As the hall is to be used sometimes for dancing, it is necessary that there should be no openings in the floor, therefore we must place our inlet openings next the walls, and, as the gangways will probably also be next the walls, we may, with advantage, bring in our fresh air at its low rate of current, and properly warmed, in a horizontal direction and at a height of about 5 ft. above the floor level. A wooden dado, with suitable perforations at the upper part, giving the required area of inlet opening or a little more, will be a suitable and satisfactory method of solving the problem, and the duct will be formed by the space between the dado and wall.

For the removal of the foul air, we will arrange openings in the ceiling, and form the space above and between the ceiling and roof covering into a foul-air chamber. This we will divide into two compartments, and over the centre of each place an outlet tube 6 ft. in diameter, surmounted with an "automatic" ventilator of the type of Buchan's or Boyle's manufacture, fitted with easily-acting valves to prevent down draught, and flaps for closing when desired. Instead of using two outlet ventilators, we might have only one if the roof is of steep pitch, and with a considerable space between it and the ceiling. The advantage of dividing the foul-air chamber into two with separate outlets is that the extraction will be more evenly diffused. The alternative arrangement should therefore only be adopted when the circumstances admit of evenly distributed extraction with one outlet.

The size of our outlet tubes is thus determined: 416 cubic feet per second is to pass through the tubes; this, with the assistance of the ventilators, may readily be effected without undue friction at the rate of about 7 feet per second, $416 \div 7 =$ say 60 feet superficial area of the section of the two tubes. $60 \div 2 = 30$ superficial feet area of one tube. Area of a 6 feet diameter circle = 28·274, which is sufficiently near. Our rate of current in the tubes is therefore a little more than 7 feet per second.

Returning now to our fresh air supply, we shall find that the best method of admitting the air to the duct behind the dado will be to construct a fresh-air chamber below the floor of the hall, and to propel the air into this fresh-air chamber by means of a rotary fan, which can be placed so as to deliver direct into the chamber, and so avoid loss of power in ducts. An alternative arrangement would be to construct ducts around the walls, which might be preferable if it were desired to utilise the space beneath the hall floor for other purposes. In this case we should incur the expense of forming the ducts, and should require increased power in our fan and engine to overcome the friction.

With such an arrangement as is proposed, the only loss of power through friction of which we need take account is that occurring in the duct or air passage behind the dado. The length of the dado, deducting for doors, will be about 210 ft.; if we allow a clear space behind of 6 in. we have $210 \times \frac{1}{2} = 105$ ft. for the superficial area of the section of the duct, and as we intend to propel 416 cubic feet per second, we shall have a rate of current in the duct of $416 \div 105 =$ say 4 ft. per second.

We now approach the problem of determining what sized fan we require for our particular case. The work we require the fan to perform is to propel 416 cubic feet of air per second through ducts whose sectional area is 105 ft., periphery of section $210 + 210 + (8 \times \frac{1}{2}) = 424$ ft., and length 6 ft., at a velocity of 4 ft. per second. This work has to be done, notwithstanding the resistance of the friction against the sides of the duct, and occurring at the entry of the air into the duct and into the hall.

The loss of power we can express in terms of the velocity, that is, our fan must be capable of driving the air not merely at a velocity of 4 ft. per second, but at some increased velocity, part of the power exerted in producing this latter being expended in overcoming the obstruction.

Referring to Chap. XII. we see that we may calculate the loss of efficiency due to friction of the duct by the formula $C = \frac{KUL}{4S}$. Here we have $K = 4 \times 0\,0005\left(\frac{1}{4} + 20\right)$

$$= 0{\cdot}0405$$

$$U = 424\,;\ L = 6\,;\ S = 105$$

$$\therefore C = \frac{0{\cdot}0405 \times 424 \times 6}{4 \times 105}$$

$$= {\cdot}245 = \text{say } \tfrac{1}{4}.$$

This means that our theoretical velocity, or the potential velocity of our fan, must be increased by $\frac{1}{4}$, so that, to maintain the actual velocity of 4 ft. per second in the duct, the fan must be capable of producing a velocity of $1\frac{1}{4} \times 4 = 5$ ft. per second.

We have also to allow for the loss at entry and exit to the duct. This we may take as equivalent to a rounded right-angled turn, as we should, of course, take the precaution to round off both the angularities, and ease the obstruction as much as possible.

From Chap. XI. we see that the loss due to a rounded right-angled turn is $\frac{1}{4}$. Hence, to maintain the 5 ft. per second theoretical velocity we have seen to be necessary, the potential velocity of our fan must be $1\frac{1}{4} \times 5 = 7\frac{1}{2}$ ft. per second. We therefore require from the manufacturer of our fan an apparatus capable of propelling 416 cubic feet of air per second at an initial velocity of $7\frac{1}{2}$ ft. per second. This would be an intelligible order, and the maker could supply for us a fan of his particular pattern which would fulfil the conditions, or we could, if we pleased, design a fan for the purpose. Thus, by referring to the price-list of the Blackman propellers, we see that a 48-in. fan with a 2-h.p. engine would perform the work required in the present case.

For such an example as that we are now considering a gas-engine would be the most suitable means of providing the power for driving the fan. Suitable gearing should be arranged to allow the velocity of the fan, and consequently the amount of fresh air, to be regulated according to the varied circumstances under which the hall would be used.

In any case in which further ducts would be required, the method of calculating the resistances, and the consequent power of the fan, would be precisely similar to that adopted above.

The additional assistance given by the "automatic" ventilators would be ample to overcome the resistance of passing through the openings in the ceiling and the tubes, but, if we pleased, we might, as before, calculate these resistances, and, taking into account the velocity obtained from the heat of the vitiated air, provide sufficient power in our fan to expel the foul air, overcoming the resistances, and so dispense with the "automatic" ventilators.

If we adopted some other means of extraction more regular and constant in working than the "automatic" ventilators, we could reduce the size of our fan, although in this case the ulti-

mate advantage would probably not be on the side of such a course.

We have now to consider the provision to be made for warming our hall, and this we must leave for another chapter.

SURVEYORSHIPS.

DIOCESAN SURVEYORSHIPS.—At a meeting of the Bishop, Archdeacons, and Rural Deans of the Diocese of Durham, held on the 10th inst., Mr. W. J. Moscrop, architect, Darlington, and Mr. Crawford Hick, architect, Newcastle-on-Tyne, were elected Diocesan Surveyors for the Archdeaconries of Auckland and Durham respectively, in the room of Mr. R. J. Johnson, F.S.A., resigned.

THE SANITARY INSTITUTE'S EXAMINATION FOR LOCAL SURVEYORS.—At an examination for Local Surveyors, held by this Institute on June 5 and 6, eleven candidates presented themselves. Questions were set to be answered in writing on the 5th, and the candidates were examined *viva voce* on the 6th. The following candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Local Surveyor:—Howard Riley Felkin, Hammersmith; Thomas James Moss Flower, Bristol; Arthur Gordon Gibbs, Pulborough; Matthew Dodgson Graves, York; Harry James Hills, New Wandsworth; Walter Robert Kay, Bury, Lancashire; Edwin Morley, Walthamstow; and Alfred John Saise, Bristol.

COVENTRY.—At a meeting of the Coventry City Council on the 9th inst., Mr. G. J. E. Jenkins, Aston, was appointed Assistant Surveyor of Coventry, at a salary of 200*l.* a year.

OBITUARY.

MR. JAMES BEAL, L.C.C.—The death took place, on the 11th inst., of Mr. James Beal, a member of the London County Council. He was born in Chelsea in 1829, and for many years followed the occupation of auctioneer and surveyor in Regent-street, being senior partner till a short time ago in the firm of Beal, Son, & Chartres. He will, however, be principally remembered as having taken a prominent part in various matters connected with London municipal government during the last thirty years. It was mainly through his exertions that the Metropolis Gas Act was passed in 1860 and the City of London Gas Act in 1868. Questions of water supply also occupied his attention, and no Parliamentary inquiry upon questions of gas and water was held without his evidence being taken. In former years he was an occasional contributor to the columns of the *Builder*.

MR. FREDERICK BENHAM.—We regret to learn that Mr. Frederick Benham, senior partner in the firm of Benham & Sons, died on the 13th inst.

GENERAL BUILDING NEWS.

NEW CHANCEL, ST. PETER'S CHURCH, BUSHEY HEATH, HERTS.—On the 8th instant the new chancel, vestries, and organ-chamber were opened by the Bishop of St. Albans. The works have been executed at a cost of about 2,000*l.*, by Mr. J. Norris, builder, of Sunningdale, from the designs and under the personal superintendence of the architect, Mr. James Neale, F.S.A. As we propose at a future date to give illustrations of the interior and exterior of this church, we hold over for the present further description of the building. After the consecration service a public lunch was held at which the Bishop took the chair. He was supported on his right by Mr. James Neale, the architect, and on his left by the Rev. Spencer Buller, the Vicar of the parish. The Bishop spoke in high terms of the new work Mr. Neale had done, and referred to his early connexion with their cathedral church, and the value his book on St. Albans had in showing the beautiful old work which he deplored had been so ruthlessly swept away by Lord Grimthorpe.

NEW BUILDINGS, RYDAL MOUNT SCHOOL, COLWYN BAY.—The new buildings in connexion with Rydal Mount School, Colwyn Bay, North Wales, for Mr. T. G. Osborn, M.A., J.P., were formally opened on Tuesday, June 16, by the Rev. Dr. Moulton, of Cambridge, President of the Wesleyan Conference. The additional buildings, which have cost over 5,000*l.*, have been designed by, and carried out under the superintendence of, Mr. T. E. Lidiard James, architect, London. Mr. J. B. Jones, of Llanrwst, was the builder; and Mr. George Malpass, of Sheffield, the clerk of works.

CHURCH, HEAP BRIDGE, LANCASHIRE.—On the 13th inst., Mr. C. Coupe laid the foundation-stone of a new church at Heap Bridge, in the Parish of St. James's, Heywood. The church, which will be one-aisled, will cost about 2,000*l.* The nave will be 60 ft. by 24 ft. 6 in., and the chancel 24 ft. by 20 ft. It will be entered by a timbered porch, adjacent to which will be a bell turret 55 ft. high. In style the church will be Late Decorated Gothic, and will provide seats for between 300 and 400 persons. Lord Derby has given the site of the church. Mr. John Lowe, of Manchester, is the architect.

PROPOSED MARKETS, BIRMINGHAM.—On the 9th inst. the Markets and Fairs Committee of the Birmingham City Council received the sanction of the Local Government Board to the loan which they asked for for the erection of the new dead meat and pig markets. The plans for the pig market have already been prepared, and the work of construction will be proceeded with at once. The plans for the dead meat market will now be proceeded with as quickly as possible.

CONSECRATION OF CHANCEL, HOLT, WILTSHIRE.—On the 9th inst., the newly-added chancel of Holt church, in the parish of Bradford-on-Avon, was consecrated by the Bishop of Salisbury. As the village has gone on increasing, accommodation has been added to the church. The north and south aisles have been added from time to time. Owing to the danger of the nave and roof settling suddenly down, supports have been put in, and a few years ago a new porch and three south windows were placed in the aisle, and pitch-pine seats were substituted for the old ones, as well as choir stalls. The tower is of old Perpendicular work, and in niches are statues of St. Paul and St. Catherine. Upon the principle embodied in the tower, the present new work has been made and carried out by the architect, Mr. Ponting, of Marlborough, and Mr. James Burgess, builder, Westbury. The aisle walls have been strengthened and new buttresses put in, a new nave has been formed, and the walls of the same carried up and made into a clearstory. The two aisles have been roofed in and covered with lead and slates, and a new chancel has been created, with organ-chamber and vestry on the north. The pulpit is of open tracery work, in carved oak. A new stained-glass window has been added to the church by Messrs. Powell, of Whitefriars, under the direction of the architect. The subject is five figures of female saints.

SCHOOL ENLARGEMENT, KEIGHLEY.—The National Day Schools at Keighley have recently received extensions costing 2,000*l.* in the shape of a new infants' school, and class-rooms for the mixed department, the increased accommodation providing about 515 additional school places. The work has been carried out under the superintendence of Messrs. W. and J. B. Bailey, of Keighley.

ALTERATIONS, &c., ST. JOHN'S CHURCH, IVYBRIDGE.—The memorial to Lord Blachford, which consists of the adornment and re-fitting of the chancel of Ivybridge Church, was dedicated on the 12th inst. The work was entrusted to Messrs. Hine & Odgers, Plymouth, the architects of the church. Carved teak wood stalls have taken the place of the former plain deal fittings; the temporary footpace of the Holy Table has been superseded by one of polished red Devon marble, whilst the wall space and re-table behind have also been executed in marble; the marble work is surmounted by a carved reredos, enclosing three panel paintings, the subject treated being the Incarnation; the walls and roof of the chancel and the organ pipes have been decorated in gold and colours. The paintings and decoration are by Mr. Fouracre; the carvings by Mr. S. Trevenen; the marble work is by Mr. Roach, and the woodwork by Mr. T. Crews, Stonehouse.

RE-OPENING OF ALL SAINTS' CHURCH, SEAGRAVE, LEICESTERSHIRE.—This church was re-opened on the 9th inst. by the Lord Bishop of the diocese, after the completion of the first section of its restoration from the plans and under the superintendence of M. E. H. Lingen Barker, of Hereford.

SANITARY AND ENGINEERING NEWS.

THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—The annual meeting of this Association will be held in London on Thursday, Friday, and Saturday next, June 25, 26, and 27. A very interesting programme has been issued.

THE BEXLEY SYSTEM OF EMPTYING CESSPOOLS.—In our article last week on this subject we inadvertently mis-stated the distance required by the Model By-Laws between cesspools and dwellings. Instead of 50 yards we should have said 50 *feet*.

REGISTRATION OF PLUMBERS.—A meeting of the Bradford District Council, formed in connexion with the Worshipful Company of Plumbers, was held at the Town Hall, on the 10th inst., when a number of rules for the Council were considered and adopted. The rules state that in order that no trade interest or prejudice may operate against any applicant, all applications for registration will be considered by committees, which shall include architects, &c., as well as practical plumbers. All applicants who cannot satisfy the Registration Committee, or any District Committee, of their experience will be required to pass an examination by a Board of Examiners, composed largely of practical plumbers. The rules further stipulate that any person having cause to complain of any registered plumber whom he is employing, either in respect of trade integrity or the sanitary efficiency of the work executed by him, may make such complaint to the Council, who will inquire into it, and forward their report to the Worshipful Company of Plumbers, to be dealt with as they may deem necessary. Lists of the names and addresses of registered plumbers are to be obtainable on application to the Worshipful Company of Plumbers and the Bradford District Council. They are also to be supplied to architects, local sanitary authorities, &c.

"SEWERAGE, RAWTENSTALL".—In reference to the short notice of this work in last week's *Builder* (p. 476) wherein it was stated that the scheme was prepared by Mr. J. E. Swindlehurst, Borough Engineer, Burton-on-Trent, Mr. Henry A. Cutler, the Borough Engineer of Rawtenstall, writes to say that he was associated with Mr. Swindlehurst in preparing the scheme, and his signature appeared on the plans submitted to the Local Government Board. The omission to state this was not ours.

STAINED GLASS AND DECORATION.

CHAPEL, MAYNOOTH COLLEGE.—The Chapel of Maynooth College is to be opened on the 24th inst. The internal decorations and fittings, for which the ceremony has been delayed, are nearly completed, under the directions of Mr. Hague, of Dublin, the architect who has charge of the work. The most conspicuous feature of the whole is one of the largest painted roofs in the United Kingdom. It contains ninety life-sized three-quarter figures, each figure occupying the centre of a panel, and is surrounded by versicles, on scrolls and ornamental work. A great many of the painted windows have also been filled by various firms. The altars are most of them of carved marble by Ryan, of Dublin, and a Mosaic pavement has been laid by Messrs. Burke, of London. The grand organ is by Stalhuth, of Aix, but the case is by Messrs. Buckley, of Youghal. In the choir, Stations of the Cross, each occupying a space of 15 ft. by 8 ft., are being painted by Mr. N. H. J. Westlake, F.S.A., of London, four of which are to be completed for the opening. Mr. Westlake also designed the painted roof, and the figures are from his studio. Mr. Mannix, of Dublin, executed the accessory ornament.

MEMORIAL TABLET, ST. MICHAEL'S CHURCH, TEIGNMOUTH.—A brass tablet has been placed on the north wall of St. Michael's Church, East Teignmouth, to the memory of Mrs. Maitland. The memorial has been executed by Mr. Harry Hems, of Exeter, and is a latten brass, with a border of polished Ipplepen marble.

MEMORIAL TABLET, ST. JOHN'S CHURCH, CHESTER.—There has just been erected in the central arch of the arcade in the west end of St. John's Church, Chester, a tablet to the memory of the late Mr. Thomas Hughes, F.S.A. The tablet is of polished brass and mounted in black marble.

ALTAR, CARMELITE CHURCH, DUBLIN.—On the 15th inst. there was blessed a new marble altar in honour of St. John of the Cross in the Carmelite Church, Clarendon-street, Dublin. The altar is mainly composed of Sicilian marble. In the antependium is carved in marble the arms of the order. On each side are inlaid panels of emperor's red marble, the altar table being supported by four pilasters of Connemara green. In the reredos and at each side of the niche, in which is a decorated statue of the saint, are panels in Carrara marble, carved in the Italian Renaissance order, and in the centre of each are medallion heads of St. John of the Cross and St. Teresa, the reredos being supported by pilasters of Sienna marble, surmounted by semi-circular panels of Galway green marble. The altar has been carried out from designs by the architect, Mr. Hague, of Dublin, and the sculptor is Mr. Herbert Barnes.

FOREIGN AND COLONIAL.

FRANCE.—A considerable fall of cliff has taken place on the shore at Yport.——The railway lines traversing the department of the Eure will shortly be incorporated in the railway system of the Compagnie de l'Ouest.——The Minister of Public Works inaugurated on Sunday last, at Tours, the footbridge above the railway stations, and laid the first stone of the Rabelais and Mirabeau educational establishments.——On June 28 will take place, at Versailles, the inauguration of the monument erected there to the memory of Houdon, the renowned sculptor of the eighteenth century.——The excavations at Arles for the construction of a new railway have led to the discovery of a very fine marble sarcophagus. The sides have relief sculpture illustrating a wedding-scene and wild-boar hunt. On the top is a recumbent statue. The work appears to belong to the first century A.D.——M. Gustave de Breton, corresponding member of the Institut, and Director of the Ceramic Museum at Rouen, has been appointed Director of the Departmental Museum of Monuments Historiques of the Lower Seine, in place of M. Maillet du Boullay, recently deceased.——The new railway station at Bécon-les-Bruyères, constructed for the Compagnie de l'Ouest, is to be opened in July. It is to form the junction for the Versailles and St. Germain lines.——M. Léon Delhomme, sculptor and member of the Municipal Council of Paris, who exhibited a statue of the elder Carnot at the Salon, has resigned membership of the Société des Artistes Français, as a protest against the decision of the jury in refusing him a medal (!).——The Exhibition of American artists, which has just opened at the Galerie Durand Ruel, consists of 150 works, in paintings and pastiles, and about a dozen works in sculpture.——The Union Syndicale des Architectes Français has just opened, at the Cercle

de la Librairie, its first exhibition, which includes works by the late Aisné, Millet, and Ruprich Robert.——Madame de Beaumont-Castries, sister of Maréchal MacMahon and a sculptor of great talent, has left to the Louvre Baudry's celebrated picture of "La Vérité," which was exhibited at the Salon of 1882.——Falguière's "Diana" at the Champ de Mars is to go to Buenos Ayres after the close of the exhibition, having been purchased for presentation there.——The Académie des Beaux-Arts proceeded on Saturday last to the election of a member in the Section of Sculpture in place of Chapu. M. Mercié was elected by 20 votes out of 34.——The prize founded in memory of Marie Bashkirtcheff, the young Russian artist, has been awarded to M. Jean Baptiste Duffaud, who has already obtained a second medal at the Salon for a painting of an episode from the poem of Mircille.——M. Rouyer, architect, has been commissioned to build the new Mairie for the Tenth Arrondissement.——The death is announced of the sculptor Soittoux, author of the statue of the République which stands in front of the Institut, facing the Pont des Arts. He obtained the commission in a competition opened in 1848 for a statue representing the Republic.

BERLIN.—A set of designs for the proposed new buildings for the Prussian Upper and Lower Houses has been laid before the "Akademie für Bauwesen" for criticism. The criticism has been severe, not only on the design, as such, but also on the programme of requirements formulated by the Parliamentary Committee that has the management of the affair. This latter part of the criticism is to be entirely disregarded by the committee, which considers itself capable of making a list of its own requirements for the architect without outside help.

MISCELLANEOUS.

MODEL DWELLINGS IN GLASGOW.—At the fortnightly Dean of Guild Court held in Glasgow on the 11th inst., Lord Dean of Guild Ure presiding, a number of applications for the erection of new buildings and for permission to alter and make additions to existing premises were granted. Among the applications was one by the Glasgow Workman's Dwellings Company for a lining to erect a tenement of dwelling-houses in Rottenrow.—The Master of Works (Mr. Whyte) took exception to the plans—which provided for the entrance to the houses on the first and higher flats being obtained by balconies running along the front of the building—on the ground, principally, that the erection of the balconies would interfere in a very injurious way with the free space in the front of the windows necessary for light and air.—It was pointed out that buildings with these balconies had been built in Edinburgh and London.—Mr. Borland, who appeared for the Company, explained that some of the directors had gone to London, and, after visiting similar tenements, they returned convinced that there was no objection to them from a sanitary or health point of view.—Mr. Whyte said he had gone to Edinburgh to examine the buildings there, with a feeling in favour of balconies, but when he went into the houses he found one room very cheerful and the other very dull. The dwellers could not tell the reason of that.—The Lord Dean of Guild said that was an objection against all rooms looking into the back. He was in favour of granting the lining. This was an experiment to see if houses could be cheapened.—The application was granted on the understanding that it was not to form a precedent.

SOCIETY OF ENGINEERS.—On the 17th inst. a visit was paid by the Society of Engineers to the Linde British Refrigeration Company's Ice Works at Lower Shadwell and the City and South London Electric Railway Company's Depôt at Stockwell. Among those present were Mr. W. N. Colam (President), Mr. J. W. Wilson, junr. (Vice-President), Mr. Chris. Anderson and Mr. W. G. Peirce (members of Council), Mr. Henry Adams, Mr. Jabez Church, Professor Henry Robinson, Mr. Arthur Rigg, and Mr. A. T. Walmisley (past-Presidents), and Mr. G. A. Pryce Cuxson (Secretary). The works of the Refrigeration Company, which are said to be the largest in Europe, if not in the world, were completed in 1889, and are capable of producing about 120 tons of ice per day, and of storing about 500 tons of frozen meat. With regard to the City and South London Electric Railway Company's Depôt, the whole of the plant for generating the electric current is situated at the Stockwell depôt, and consists of three Edison-Hopkinson dynamos, manufactured by Messrs. Mather & Platt, of Manchester. Each machine is capable of generating 450 ampères at 500 volts, and is driven by a vertical compound engine constructed by Messrs. Fowler & Co., of Leeds. These engines indicate up to 400 horse-power. The high-pressure cylinders are 17 in. diameter, and the low pressure 27 in., stroke 27 in., motive speed 450 ft. per minute, and the steam pressure 140 lbs. per square inch. The fly-wheels are 14 ft. diameter and 29 in. broad, driving the dynamos at 500 revolutions per minute. The current from two machines is capable of working the line at any time, leaving the third in reserve. The hydraulic machinery for working the lifts at the various stations is in the same engine-house as the electric plant, and consists of three 100-horse-power engines and pumps, which deliver into an accumulator at 1,200 lbs. pressure. Two engines are required to do the work, and one is in reserve. The steam is supplied by six Lancashire boilers, 28 ft. by 7 ft., fitted with Vicars's mechanical stokers, and set on Messrs. Livett's improved principles for the prevention of smoke. Sir George Barclay Bruce, past-President Inst. C.E., has recently been elected an Honorary Member of the Society.

ROCK ASPHALTE.—The Brunswick Rock Asphalte Paving Company, we understand, are laying with this material the new stables just purchased by the Duke of Wellington in Relton-mews, Knightsbridge.

REMOVAL.—Messrs. J. H. Strudwick & Son inform us that, in consequence of the lease of their premises, Montague-chambers, Bedford-street, Strand, having fallen in to the Bedford Estate, they have removed their offices to Falcon-court, 32, Fleet-street, E.C. (opposite St. Dunstan's Church).

UNIVERSITY COLLEGE CONVERSAZIONE.—Professor Roger Smith asks us to mention that any old students in the Class of Architecture at University College who may not have received invitations for the *conversazione* on the 30th (owing to their present addresses not being known at the College), will receive a card if they will send their names and addresses to the secretary at the College.

THE ENGLISH IRON TRADE.—Business in the English iron market during the past week has been very inactive, a state of affairs which threatens to prevail for an indefinite period. There are now very few transactions passing in Scotch warrants, and the future of this branch appears very uncertain. Scotch makers' iron remains quiet, and the various brands are quoted from 6d. to 2s. lower on the week. Middlesbrough pig is inactive, most of the production being turned into warrants. The price of No. 3 pig is, however, 3d. higher. Bessemer iron is quiet, but quotations are firm at an advance of 1s. for mixed numbers. There is a somewhat improved tendency noticeable in manufactured iron, but rates continue unremunerative. Tin-plates are only in moderate demand, and prices have been further reduced. The outlook in the steel trade generally is far from promising, and shipbuilders and engineers experience a scarcity of new orders. Although the coal trade continues fairly steady prices incline towards a reduction. *Iron.*

ROYAL METEOROLOGICAL SOCIETY.—The concluding meeting of this Society for the present, session was held on Wednesday evening, the 17th instant, at the Institution of Civil Engineers, 25, Great George-street, Westminster, Mr. Baldwin Latham, M.Inst. C.E., President, in the chair. Mr. J. J. Colman, M.P.; Mr. E. B. Dukoff-Gordon, B.A.; Mr. G. E. Leon; Mr. T. de C. Meade, Assoc. M.Inst. C.E.; and Mr. F. Russell, F.R.G.S., were elected Fellows of the Society. Mr. A. J. Hands, F.R. Met. Soc., gave an account of a curious case of damage by ligatning to a church at Needwood, Staffordshire, on April 5, 1891. The church was provided with a lightning-conductor, but Mr. Hands thinks that when the lightning struck the conductor a spark passed from it to some metal which was close to it, and so caused damage to the building. Mr. W. Ellis, F.R.A.S., read two papers (1) "On the Mean Temperature of the Air at the Royal Observatory, Greenwich, as deduced from the photographic records for the forty years from 1849 to 1888." (2) "On the Comparison of thermometrical observations made on a Stevenson screen, with corresponding observations made on the revolving stand at the Royal Observatory, Greenwich." Mr. W. F. Stanley, F.R. Met. Soc., exhibited and described his "Phonometer," which is really a new form of chronograph designed for the purpose of ascertaining the distance of a gun from observations of the flash and report of its discharge, by the difference of time that light and sound take in reaching the observer. The instrument can also be used for measuring the distance of lightning by timing the interval between the flash and the report of the thunder. A paper was also read by Mr. A. B. MacDowall on "Some Suggestions bearing on weather prediction."

LEGAL.

CASE UNDER THE METROPOLITAN BUILDING ACT.

WHAT IS A "BUILDING?"—TEMPORARY STRUCTURES.

THE case of "The London County Council *v.* Candler" originally came before the Court on November 24, 1890. The "Prince of Wales" Tavern, at the corner of Coldharbour-lane, Brixton-road, is undergoing extensive alterations by the defendant builder under the supervision of Mr. Cruwys, the owner's architect. The house is set back from the Brixton-road by the intervention of a large open space, and for the accommodation of the business during the builder's operations a wooden one-story erection has been built on this space 10 ft. from the highway. Notice was duly given to Mr. Parsons, the District Surveyor, who made no objection, and who has been paid his fee. But the London County Council summoned defendant for penalties under the Amendment Act 1882, sec. 13, "for erecting a wooden structure or erection of a movable or temporary character without a licence in writing first had and obtained from the Council for the erection or setting up of such structure or erection." On this occasion defendant pleaded the end of the section, which exempts such temporary structures "erected by a builder for use during the construction, alteration, or repair of any building;" but the Council contended that the phrase in the exemption part of the section "erected by a builder for use" meant for use by the builder; whereas in this case it was used by the licensed victualler in which to carry on his trade. The magistrate (Mr. Hopkins) dismissed the summons, but at the instance of the London County Council granted a special case, which was argued in April this year before the Queen's Bench Divisional Court, when Justices Grantham and Smith reversed the decision of the magistrate, and held that the exemption in sec. 13 of the 1882 Act extended only to temporary structures for *use by the builder*, and not to those used by other persons, and the case was remitted to the magistrates for adjudication.

On June 15 the case was further heard at the Lambeth Police-court, when it was urged for defendant that the Council had no *locus standi*, and that the prosecution, if any, should be by the District Surveyor; but, although it was admitted by the prosecuting solicitor in answer to the magistrate that the Council had not the general powers of the District Surveyors, the magistrate over-ruled the point. The further point was then taken on behalf of the defendant that the structure complained of was a building which, not exceeding 30 ft. high, being of the cubical capacity of 19,000 ft. only, and distant more than 8 ft. from the street and more than 30 ft. from the nearest buildings and ground of adjoining owner, was exempt under the fourteenth of the series of exemptions in sec. 6 of the Building Act of 1855, which exemptions were expressly maintained in sec. 13 of the Amendment Act of 1882. The prosecuting solicitor admitted the dimensions and distances as correct, and as complying with such exemption clause, but contended that this clause applied only to "buildings," and that what was under discussion was not a "building," but a "wooden structure or erection of a movable or temporary character," and contended that no such structure or erection could be legally put up anywhere within the Metropolitan area, no matter how far distant from the street or from other buildings or other owners' land, without the licence of the London County Council being first obtained.

Mr. Parsons, District Surveyor, was examined, and deposed that he considered the building exempt, and that no licence was required, and that he, therefore, had not reported it to the Council.

Mr. Arthur Harston, F.S.I. (A. & C. Harston), architect and surveyor, gave evidence that the building was one story high, constructed of timber on a brick foundation let into the ground, and was roofed with iron; it contained a bar, dining-room, kitchen, and beer and spirit store; it was not movable as a whole, and *qua* building was not temporary, as it was capable of lasting from twenty to thirty years, and that he considered it to be a "building" which in its construction is within the operation of the Act of 1855, and of which notice should be given to the District Surveyor, who should survey it; and that but for the facts that from its situation and cubical contents it was exempted from the operation of the first part of the Act of 1855, the District Surveyor should properly object to it as an "irregular building," but the exemption being expressly continued in the Amendment Act of 1882, he considered that no licence from the Council was necessary.

Mr. Cruwys, the architect of the tavern building, concurred.

The magistrate (Mr. Hopkins) said the only point was whether the erection in dispute was a "building" or was it a "structure"? He held it not to be a "building" but a structure of a temporary character, therefore illegal under sec. 13 of the 1882 Act, unless licensed by the County Council; and that not being a "building" it did not come under the exemption in sec. 6 of the Act of 1855. He therefore convicted defendant in a fine of £5 and 5s. per day for twenty-six days, and allowed the County Council £5. 5s. costs.

The prosecuting solicitor was Mr. Burton, of the Solicitors' Department of the London County Council. The defendant's counsel was Mr. Germaine, L.C.C.

It is probable that the decision will be appealed, being on a point not included in the special case on which the Divisional Court gave judgment in April. —*Communicated.*

THE OFFICE OF CITY ARCHITECT.—The *City Press* of Wednesday stated that the Officers and Clerks' Committee of the Court of Common Council were to present a report to the Court at its meeting on Thursday with a recommendation that a successor shall be appointed to the late Mr. Peebles at a salary of 1,000*l.* a year, and that the person appointed shall in the future be designated City Surveyor. We had not learned the fate of this recommendation up to the time we went to press. In addition to the names we have previously mentioned, we see it announced that Mr. F. R. Farrow is a candidate for the appointment.

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
Intermediate School, Ystalyfera, Glamorganshire	Building Committee..	10*l.* 10*s.*	June 30

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered
*Supplying and Laying Tar Paving	Beckenham L. B.	G. B Carlton	June 22
*Others' Houses, Pailing, nr. N. Yarmouth	Admiralty	*Official*	June 23
*Belgian, Guernsey, &c. Granite	Ilford Loc. Bd.	do.	do.
*Road Works	Lewisham Bd. of Wks	do.	do.
*Public Elementary Schools	Howe School Board	T. Simpson	do.
Masonry, Aberdulais Bridge	Neath District High. Board	D. M. Davis	do.
Masonry of Bridge, Resolven	do.	do.	do.
Providing and Laying Sewer Pipes, Barony Drainage	Lanark District Com.	W. R. Copland	do.
Destructor Buildings, &c.	Aston Manor Loc. Bd.	W. A. Davies	do.
Drainage Works, Polruan	Liskeard, R.S.A.	do.	June 24
Limestone Road Metal (1,500 tons)	Nantyglo and Blaina Loc. Bd.	do.	do.
*Two Upright Heating Stoves	Greenwich Union	do.	do.
Sewerage Works	Altrincham L. B.	Jno. Stokoe	June 25
*Erection of Theatre	Merthyr Theatre Co. Lim.	T. C. Wakeling	do.
*Extending Room and Dividing Ward, New Cross	Met. Asylums Bd.	Jarvis & Son	do.
*Paving Two Coal Yards, Stockwell	do.	do.	do.
Coal Yard and Cattle Mound, Salford	Lancs. & Yorks. Ry Co.	*Official*	do.
Warehouse, Royton	do.	do.	do.
Boundary Wall, &c. Penylan-road	Cardiff Corporation	W. Harpur	do.
Sewerage, Bridge, and Road Works	do.	do.	do.
Main Sewerage	Sheffield Corporation	G. Alsing	June 26
*Sewers Work	Walthamstow Loc. Bd.	G. W. Holmes	do
Additions and Alterations to Chapel, Penpergwm, near Abergavenny		Thos. Roderick	do.
Twenty-six Cottages, Boundary Wall, &c.	Consett (Durham) Indus. & Prov. Soc.		June 27
Alterations to Church, Newton Reigny, Penrith	do.	C. J. Ferguson	do.
Alterations to Church, Wasdale Head, Cumberland	do.	do.	do.
Wesleyan Chapel, Brunington, South Devon	do.	H. J. Snell	do.
Gas-holder, Iron Roof, and Bridge (3 contracts) at Gas-works	Stafford Corporation	J. F. Bell	do.
Stabling, House, &c.	Consett (Durham) Industrial & Prov. Soc.	W. S She'l	June 29
*Sewering and Making up Roads, &c.	Hendon Loc. Bd.	S. S. Grimley	do.
*Paviors Work	Vestry of St. Mary, Islington	*Official*	do.
*New Street Works	Camberwell Vestry	do.	do.
*Road Works and Street Improvements	Toxteth Park L. B.	J. Price	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Broken Granite, Granite Kerbs, &c.	Boro' of Croydon	W. Pawell	June 30
Alterations, &c. at Workhouse	Newton Abbot Gdns.	S. Segar	do.
*Painting, &c Works at Infirmary	Paddington Guardians	A. & C. Harston	do.
New Cemetery	Witton & Dane Bridge (Chester) Burial Bd.	Jas. Holland	do.
*Construction of Reservoir	Bideford Corporation	Baldwin Latbem	July 1
*Alterations, &c. Western Fever Hospital	Metropolitan Asylums Board	A. & C. Harston	do
Town Hall, Tonypandy	Town Hall Co. (Lim)	R. S. Griffiths	do.
Pumping Machinery, Boilers, Engines, &c.	Gothenburg (Sweden) Waterworks Board	*Official*	do.
*Underground Urinals	Com. of Sewers	do.	July 3
*Brick and Pipe Sewers, &c.	Smethwick Local Board	Harris & Harris	do.
Iron Bridge Work, Walcot	Salop C. C.	A. T. Davis	July 4
Schools, Laira, Devon	Egg Buckland & Laira Green School Board	H. J. Snell	do.
*Inner Lining to existing Gasholder Tank	Sheffield U. Gas Light Co.	F. W. Stevenson	July 6
Widening Bridges	East Sussex C. C.	H. Card	do.
*Mason's Work and Repairs to Mortuary, &c	Camberwell Bur. Bd.	— Whallock	do.
*Road Materials	Acton Local Board	D. J. Ebbetts	July 7
Castings, &c.	Carlisle Gas Committee	J. Hepworth	do.
Lime (800 tons), &c.	do.	do.	do.
*Alterations and Additions to Workhouse	Fulham Union	H. Saxon Snell	July 16
*Additions to Hartley Institute, Southampton	The Council	*Official*	July 18
*New Vicarage, House, and Offices, near Spalding	The Committee		July 23
*Shops, Offices, and Citadel, Sheffield	Salvation Army	W. Gilbee Scott	No date
*Citadel, Southsea	do.	do.	do.
*Builder's Work, Painting, &c.	Mile End Old Town Guardians	*Official*	do.
Sixteen Houses, Roundhay-road, Leeds	.....	Jas. Charles & Son	do.
Additions and Alterations to Warehouse, &c. North-street, Leeds	G. E. Hartley	W. S. Braithwaite	do.
Alterations St. John's Church, Hunton, Jervaulx	.....	Thos. Winn	do
Reservoir Work, Iron Works, Govan, N.B	.....	R Stewart	do.
Mission Church, Woodhouse Mill, near Sheffield	.....	John D. Webster	do'
Alterations to Premises, Byker, Durham	J. Richardson	A. P. Farthing	do.
Church St. Mary's, Gateshead	.....	Stephen Piper	do.
Re-building Premises, South Shields	J. Fenwick & Sons	T. A. Page & Son	do.
Road-making and Sewerage, Whitley, Durham	.....	H. Gibson	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Two Assistant Road Foremen	West Ham Corporation	2*l.*	July 4

Those marked with an Asterisk (*) are advertised in this Number. *Contracts, pp.* lv., vl., *and* viii. *Public Appointments, p.* xx.

CAPITAL AND LABOUR.

THE LOCK-OUT OF LONDON CARPENTERS AND JOINERS.—The situation remains practically unchanged as the end of the fourth week of the lock-out, and the sixth week of the strike, approaches. The workmen have issued a manifesto appealing to workmen generally to help them with funds, and stating that "the Master Builders' Association have, up to the present, refused to make the slightest approach toward an honourable settlement, although we have made repeated efforts to do so. They have been most active in their attempts to replace the men locked out, by both advertising and employing agents throughout the country districts, and also by attempting to obtain foreign labour; but so far our efforts to keep the shops and jobs clear of blacklegs have been successful, though they have been at the same time very expensive." We are authorised to state that there is no truth whatever in the reports that the masters have declined to meet the men. Since the conference on May 1 last, no communication of any kind whatever has been received from them. As to other statements of the men, Messrs. Mowlem & Co., we hear, only require twenty more men to fill up their shops and jobs. Messrs. Patman & Fotheringham have all the men they require on their outside works, but have still some difficulty in getting men into the shops, owing to the activity of the pickets. The *Daily News* of Thursday says that the executive of the London United Trade Committee of Carpenters and Joiners report that in response to their appeal for funds on behalf of the 3,000 men locked out or on strike, contributions are coming in freely; whilst on Wednesday, contingents of workmen left London for Bournemouth and Eastbourne, and written applications for carpenters and joiners were received from Wolverhampton and Burton-on-Trent.

MEETINGS.

SATURDAY, JUNE 20.

Dundee Institute of Architecture. — Excursion to Anstruther, Elie, and District.

MONDAY, JUNE 22.

Royal Institute of British Architects.—(1.) Presentation of the Royal Gold Medal to Sir Arthur W. Blomfield, A.R.A. (2.) Mr. J. Tavenor Perry on "Mediæval Architecture in Sweden." 8 p.m.

THURSDAY, JUNE 25.

Incorporated Association of Municipal and County Engineers.—Annual Meeting in London. Presentation of Report and Premiums and President's Address, 12 noon. (1.) Mr. R. Godfrey on "Wayleaves and Easements." (2.) Mr. T. Walker on "House Drainage." (3.) Mr. E. J. Silcock on "Creosoting Timber." (4). Mr. W. Thomas on "Surveying." 2.15 p.m.—Annual Dinner, Holborn Restaurant. 6 30 p.m.

Victoria Institute.—Annual meeting: Address by Mr. Naville. 8 p.m.

FRIDAY, JUNE 26.

Incorporated Association of Municipal and County Engineers.—Annual Meeting (continued). (1.) Mr. W. H. Preece on "The Relative Merit and Cost of Gas and Electricity for Lighting Purposes." (2.) Professor Robinson on "Electric Lighting by Municipal Authorities" (3.) Mr. W. Spinks on "Some Suggestions in Relation to Private Improvements." 11 a.m.—Visit to Messrs. Doulton & Co.'s works, Lambeth. 1 p.m.—Visit to the Electric Railway Depôt Works, Stockwell. 3.15 p.m.—Visit to the Naval Exhibition. 5 p.m.

Royal Institution.—Faraday Commemoration Lecture, by Professor Dewar, M.A, F.R.S. 9 p.m.

SATURDAY, JUNE 27.

Incorporated Association of Municipal and County Engineers.—Annual Meeting (continued). Visits to the Tower Bridge, Deptford Abattoirs, Electric Supply Corporation Works, Deptford, and The Outfall Works at Crossness.

Liverpool Engineering Society.—Summer Excursion to the Thirlmere Aqueduct.

Glasgow Architectural Association.—Visit to Bothwell Castle.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

1,573.—FIREPLACES: *R. Jewell.*—The fireplace which is the subject of this patent is made with an inner chamber, surrounded by incandescent fuel. From the lower end of this chamber a flue leads up the back of the fireplace and terminates in a downward-directed opening in front. On a fire being lighted the heated column of air and gases ascending inside the chamber produces down draught, and the smoke, &c., is also drawn down and consumed within the chamber.

8,668.—VARNISHES: *B. Pifard.*—The process of manufacture referred to in this specification consists in mixing colophony with lead, oxide, and wax, or waxy matter, then fusing the mixture, drawing off the clear liquid portion, and afterwards dissolving it in a solvent.

9,489.—IMPROVEMENTS IN WATER-CLOSETS: *J. & A. Duckett.*—For multiple closets constructed according to this patent, contracted tubular connexions interpose between the closet basin and the supply, thus ensuring a uniform depth or stratum of water throughout the system.

9,977.—VENTILATORS: *R. L. Hickes.*—According to this invention, a small wooden framework, with perforated metal or wire gauze, is placed at the bottom of the open window, the space between the two sashes then assisting in the ventilation without draughts.

9,984.—COWLS OR CAPS: *J. Watson.*—In the cowl which is the subject of this patent, several concentric cylinders are used; the inner cylinder is closed at each end, and fitted with three or four vertical plates connecting the inner cylinder with an intermediate concentric cylinder: this is connected to the outer cylinder by other radial plates. The top of the outside cylinder is fitted with an annular cover, which is supported by a smaller cylinder or convoidal connexion with the flue to be ventilated; openings are made for the escape of air and gases. All tubes fit together by a bayonet joint.

17,417.—DOOR HANDLES: *G. Lewin.*—The shank of the handle is made with two collars or flanges with a small space between the two to receive the rose, which is fashioned of peculiar shape, so that it will not allow the handle to be withdrawn until turned into position.

19,081.—WORKMEN'S FLASK: *D. W. Kerr.*—The flask which is the subject of this patent is of metal, and is of cylindrical shape, with a conical shoulder having a double brass screw on top. The socket is soldered on to the top of the flask,—half the screw outside, half inside. When the outside half of screw is screwed on to the flask the cup is then used as a filler; when the cap of the screw is on it is used as a drinking-cup; when the cup is inverted and the inside part of the screw turned into the flask, the cup can be screwed down, making the whole perfectly tight.

NEW APPLICATIONS FOR PATENTS.

June 1.—9,152, G. Chisholm, Jun., Locking and Unlocking, automatically, Window-sashes, &c.—9,165, H. Fitzpatrick, Springless Locks.—9,186, J. Sim, Fittings for Windows, Doors, &c —9,200, K. Werzinger, Stove or Heating Apparatus.—9,202, C. Tuckfield, Catch for Doors and Gates.—9,216, S. Jefferies, Machinery for making Bricks, Tiles, &c —9,220, H. Godwin and W. Hewitt, Fender, Hearth, Wall, and other Tiles.—9,235, C. Jarman, Plumber's Stove.

June 2.—9,312, G. Brown, Inlet Air-ventilating tubes.—9,319, W. Thompson, Process and Compositions for Coating Damp Walls, &c.—9,329, J. Bousfield, Glazing Bars.

June 3.—9,360, R Ewing, Sewer-pipe Joints.—9,378, F. Query, Filter Bricks.—9,389, T. Unwin, Picks, Mason's Hammers, &c.—9,421, E. Pratt, Portable Scaffolding.—9,440, W. Horn, Metallic Lathing for Walls.—9,443, G. Moore, Sash-fastener.

June 4.—9,464, J. Gough, Sash-fastener.—9,472, W. Trousdale, Door-latches, &c.—9,516, T. Clark, Sash-fastener.—9,521, J. Galbraith, Hinge for automatically closing Gates, &c.

June 5.—9,536, L. Labois, Manufacture of White Lead.—9,531, J. Giraud and I. Marini, Apparatus for Working Stones and Shaping them into Cornices.—9,541, S. Hill, Fastening for Doors, Window-sashes, &c. —9,562, A. Browne, Construction of Roadways.

June 6.—9,578, J. Fryer, Ventilators or Extracting Cowls.—9,605, W. Walker, Slop Stones and Jointing the Waste-pipe thereto.

PROVISIONAL SPECIFICATIONS ACCEPTED.

7,133, E. Wehrli, Facings or Covering Plates or Slabs for Architectural Purposes.—7,429, A. Simmons, Tap Socket and Pipe Connexion or Sleeve for Pipes to enable water or gas to be drawn from any desired part of a pipe without the usual joint; applicable also for closing the open parts of burst pipes.—7,475, R. Jeffrey, Door Knockers.—7,597, A. Henning, Sash-fastener.—7,576, W. Alexander, Sash-fastener.—7,631, A. Adams and J. Hallam, Sash-fastenings.—7,646, F. Gibbons, Window-sashes.—7,650, H. Downing, Sash-fasteners.—7,950, F. Matthews and T. Westaway, Sash-fasteners.—7,965,

J. Hunter, Sash-fastener.—8,597, A. Haigh, Wood-sawing Machines.—8,717, A. Laverack, Heating Buildings, &c.—8,739, C. Everson, Metal Roof.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

7,347, C. Kimplen, Brick-making Machines, &c.—7,567, W. Martin and others, Window-sashes.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JUNE 4.—By *Worsfold & Hayward* (at Dover): 1 to 8, River-st., River, near Dover, f., 400*l.*; five freehold cottages, 330*l.*; a plot of freehold land, 250*l.*; f. residence, "Beech Grove," Ewell, near Dover, r. 50*l.*, 630*l.*; two plots of f. land, Park-rd., 255*l.*; a plot of f. land Wellington-rd., 100*l.*

JUNE 8.—By *W. J. Newell:* 209, 211, and 213, St. James's-rd., Bermondsey, u.t. 44 yrs., g.r. 9*l.* 12s., r. 81*l.*, 810*l.*; 45, The Grange, u.t. 28 yrs., g.r. 26*l.*, 125*l.* By *J. A. Smith:* F.g.r. of 12*l.*, with reversion in 86 yrs., Heathfield-gardens, Chiswick, 300*l.*; 34 and 36, Heathfield-gardens, f., r. 74*l.*, 925*l.*; 2, 3, and 6, Coningham Mews, Shepherd's Bush, u.t. 72 yrs., g.r. 4*l.*, r. 67*l.* 2s., 650*l.*

JUNE 9.—By *W. Levens:* Detached house, Southend-road, Beckenham, u.t. 81 yrs., g.r. 40*l.*, 1,725*l.*—By *Debenham, Tewson, & Co.:* 3 to 8, Mulberry-st., Whitechapel, f., r. 170*l.*, 2,520*l.*; 77 and 79, Wakering-rd., and 1, 2, and 3, Russell Cottages, Barking, f., r. 97*l.* 5s., 700*l.*; 44, Carlton-rd., Tufnell Pk., u.t. 84 yrs., g.r. 8*l.* 7s. 6d., 310*l.*; 19, Old Ford-rd., Bethnal-green, f., r. 40*l.*, 800*l.*—By *Mullett, Booker, & Co.:* 4, Inverness-mews, Hyde Pk., u.t. 57 yrs., g.r. 8*l.*, 230*l.*—By *H. Donaldson:* 8 and 10, Glebe-st., Chiswick, u.t. 77 yrs., g.r. 7*l.*, r. 52*l.*, 250*l.*—By *Harman Bros.:* F.g.r. of 20*l.*, with reversion in 91 yrs., Mayo-rd., Willesden, 420*l.*; leasehold house, Merton-rd., Wandsworth, u.t. 92 yrs., g.r. 9*l.*, r. 41*l.*, 225*l.*—By *Humbert, Son, & Flint:* 71, 72, and 73, Highst., and 1 to 5, King-st., Oxford, f., area 7,810 ft., 6,900*l.*; cottage residence and 2r. 17p., f., Cowley, near Uxbridge, 550*l.*—By *Messrs. Chadwick*, Kensington-pk.-rd., Notting Hill, f.g.r.'s of 70*l.* 13s., with reversion in 45 yrs., 2,350*l.*; f.g.r.'s of 65*l.* 2s., with reversion in 50 yrs., 1,950*l.*; f.g.r.'s of 79*l.*, with reversion in 59 yrs., Pembridge-rd., 2,280*l.*; f.g.r.'s of 50*l.*, with reversion in 22 yrs., Portobello-rd., 2,500*l.*; f.g.r.'s of 150*l.*, with reversion in 49 yrs., Bennett's-yd., 4,250*l.*; 5, Adelaide-pl., London Bridge, u.t. 21 yrs., g.r. 150*l.*, r. 350*l.*, 900*l.*; "London Bridge Warehouse," Lower Thames-st., u.t. 21 yrs., no g.r. 2,100*l.*; Five Arches in Lower Thames-st., u.t. 2 yrs., rent charge 5*l.*, 555*l.*; 10, Southwark Bridge-rd., Southwark, u.t. 23 yrs., g.r. 60*l.*, r. 140*l.*, 690*l.*; a warehouse in Rose-alley, u.t. 23 yrs., g.r. 60*l.*, r. 150*l.*, 760*l.*; 4 to 12 (even) Brockham-st., and the chapel in Coke-st., u.t. 4 yrs., g.r. 52*l.*, 202*l.* 15s., 430*l.*

JUNE 10.—By *Hobson, Richards, & Co.:* F.g.r. of 31*l.* 10s., with reversion in 88 yrs., Wandsworth, 635*l.*; f.g.r. of 10*l.* 10s., with reversion in 88 yrs., Bruntwood-ter., 240*l.*; f.g.r. of 15*l.* 15s., with reversion in 87 yrs., Cumberland-villas, 315*l.*; f.g.r. of 8*l.* 9s., with reversion in 87 yrs., Turtle-rd., 180*l.*—By *Boyce & Evens:* 23, Richmond-rd., Dalston, u.t. 63 yrs., g.r. 6*l.* 10s., r. 34*l.*, 300*l.*; 43, Newton-st., u.t. 41 yrs., g.r. 4*l.* 4s., r. 33*l.*, 340*l.*; 22 to 36 (even), 40 and 42, Myrtle-st., and a block of workshops, u.t. 63 yrs., g.r. 160*l.*, r. 833*l.*, 4,500*l.*—By *Beadel & Co.:* "Alsteads Farm," Essex, f., 170a. 1r. 25 p., 2,550*l.*; "Lawns Farms," 119a. 3r. 29p., f., 1,500*l.*; an enclosure of f. land, 10a. 3r. 4p., r. 10*l.*, 150*l.*; "Chiswick End Farm," Melbourn, Cambs., 17a. 1r. 19p., f., r. 40*l.*, 1,300*l.*; enclosures of arable land, 79a. 1r. 22p., f., 2,655*l.*; enclosures of orchard land, 1a. 0r. 29p., f., 185*l.*; several cottages, houses with shops, &c., f., 1,390*l.*

JUNE 11.—By *D. J. Chattell:* F. land, 4a. 1r. 39p., Kemnal-rd., Chislehurst, 3,000*l.*; "Preston Farm," Ightham, Kent, 16a. 1r. 14p., f., r. 64*l.*, 1,780*l.*—By *C. C. & T. Moore:* No. 114, East India Dock-rd., f., 550*l.*; 56, Avenue-villas, Wallington, u.t. 78 yrs., g.r. 10*l.*, 60*l.*; 79 and 81, St. Dunstan's-rd., Mile End, u.t. 59 yrs., g.r. 9*l.*, 230*l.*; 54, Brownlow-rd., Dalston, u.t. 54 yrs., g.r. 4*l.*, 330*l.*; 20 and 22, St. Leonard's-av., Bromley-by-Bow, f., r. 42*l.* 12s., 385*l.*—By *G. Robins:* F.g.r. of 75*l.* 15s., u.t. 30 yrs., g.r. 30*l.*, Lisson-grove, 640*l.*; 2 to 12 (even), Lonsdale-rd., Bayswater, u.t. 52 yrs., g.r. 30*l.*, r. 242*l.* 14s., 1,700*l.*; F.g.r. of 40*l.*, u.t. 52 yrs., g.r. 11*l.*, Ledbury-rd., 455*l.*; 93 and 95, Pembroke-st., Caledonian-rd., u.t. 62 yrs., g.r. 5*l.*, r. 90*l.*, 53*l.*—By *E. Wood:* 14, Stratford-pl., St. Pancras, u.t. 53 yrs., g.r. 9*l.*, r. 38*l.*, 340*l.*; 3, Upper Station-rd., Finchley, u.t. 83 yrs., g.r. 11*l.*, r. 31*l.* 4s., 100*l.*; 28, Bonham-rd., Brixton, u.t. 76 yrs., g.r. 8*l.*, r. 36*l.*, 330*l.*; 30, Shelverton-rd., Putney, u.t., 96 yrs., g.r. 7*l.* 10s., 335*l.*—By *Newbon & Co.:* "Sunderland Villa," Romford-rd, Forest-gate, f., 660*l.*; 3 and 5, Englefield-rd., Kingsland, u.t. 20 yrs., g.r. 8*l.* 5s., r. 74*l.*, 625*l.*; 1, Canonbury-grove, Canonbury, u.t. 27 yrs., g.r. 6*l.* 10s., 250*l.*; 37 and 39, Palm-st., Bethnal Green, u.t. 41 yrs., g.r. 9*l.*, r. 67*l.* 4s., 325*l.*; "Rutland House," Colney Hatch-lane, Muswell-hill, f., r. 65*l.*, 625*l.*; "Marsden House," f., r. 50*l.*, 605*l.*; "Claremont House," f., r. 55*l.*, 615*l.*; 10, Mildmay-pk., Stoke Newington, f., r. 46*l.*, 315*l.*; 7 and 11, Hawley-st., Chalk farm, u.t. 39 yrs., g.r. 10*l.* 10s., 520*l.*—By *G. H. Breadmore:* 7 St. Clears, The Avenue, Kew, u.t. 87 yrs., g.r. 14*l.*, r. 85*l.*, 810*l.*—By *E. Stimson:* Freehold building site, Church-rd., Norwood, 1,260*l.*; 11 and 13, Oval-rd., Clapham, u.t. 28 yrs., g.r. 8*l.*, r. 73*l.* 12s., 370*l.*—By *Dyer, Son, & Hilton:* 107, Lewisham-rd., Blackheath, u.t. 31 yrs., g.r. 6*l.*, 5*l.*

JUNE 12.—By *S. Walker & Runtz:* 2 and 4, Palmerston-rd., Forest-gate, u.t. 76 yrs., g.r. 10*l.*, r. 48*l.*, 430*l.*—By *Mansell & Rowe:* "Gloucester House," Church-rd., Norwood, u.t. 71 yrs., g.r. 25*l.* 10s., 1,590*l.*—By *C. R. Cross:* F.g.r. of 10*l.* 10s., with reversion in 88 yrs., Grove-villas, Sudbury, 235*l.*—By *C. W. Davies:* 93, Uxbridge-rd., Kingsland, u.t. 30 yrs., g.r. 4*l.*, r. 32*l.*, 240*l.*; 19, St. Jude-st., Stoke Newington, u.t. 41 yrs., g.r. 4*l.*, r. 28*l.*, 235*l.*; No. 429, Holloway-rd., u.t. 31 yrs., g.r. 8*l.*, r. 45*l.*, 315*l.*; 72, Seven Sisters-rd., u.t. 14 yrs., g.r. 7*l.*, r. 53*l.*, 335*l.*; 3, Tyndale-ter., Islington, u.t. 53 yrs., g.r. 6*l.* 10s., r. 45*l.*, 395*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; f.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.		
ton	8/0/0	9/0/0
Teak, E.I.. load	8/10/0	14/0/0
Sequoia, U.S.ft.cn.	2/3	3/0
Ash, Canada load	2/10/0	4/5/0
Birch, do.	2/0/0	2/15/0
Elm, do.	3/10/0	4/15/0
Fir, Dantzic, &c.	2/0/0	3/15/0
Oak, do.	2/10/0	4/10/0
Canada.....	4/17/6	6/10/0
Pine, Canada red	2/10/0	3/10/0
Do. yellow	2/0/0	3/0/0
Lath, Dantzic, fath	5/0/0	6/0/0
St. Petersburg	5/0/0	7/0/0
Deals, Finland,		
2nd & 1st std 100	7/15/0	10/10/0
Do. 4th & 3rd..	7/5/0	8/5/0
Do. Riga	6/5/0	7/15/0
St. Petersburg,		
1st yellow ..	9/15/0	14/10/0
Do. 2nd yellow	8/5/0	9/5/0
Do. white	6/15/0	10/10/0
Swedish	5/15/0	15/15/0
White Sea	8/0/0	17/5/0
Canada, Pine 1st	13/0/0	24/0/0
Do. do. 2nd....	9/0/0	16/10/0
Do. do. 3rd, &c.	6/10/0	10/0/0
Do. Spruce. 1st	8/15/0	11/0/0
Do. do. 3rd & 2nd.....	6/5/0	7/15/0
New Brunswick	5/5/0	7/5/0
Battens, all kinds	3/10/0	10/10/0
Flooring Boards,		
sq., 1 in. prep.		
1st	0/10/0	0/14/0
Do 2nd	0/8/0	0/10/6
Other qualities	0/6/0	0/7/6
Cedar, Cuba ..ft.	/4	/4½
Honduras, &c.	/4	/4½
Mahogany, Cuba,	/4½	/8½
St. Domingo,		
cargo av	/4½	/8½
Mexican do. do	/4½	/5½
Tobasco do. do	/8½	/7
Honduras do..	/5½	/8½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio.....	10/0/0	20/0/0
Bahia	9/0/0	16/0/0

TIMBER (*continued*).		
Satin, St. Do-		
mingo .....ft.	0/0/10	0/1/8
Porto Rico	0/0/10	0/1/6
Walnut, Italian ..	0/0/8½	0/0/7
METALS.		
IRON—Bar, Welsh,		
in London..ton	6/5/0	6/15/0
Do. do. at works		
in Wales	5/15/0	6/5/0
Do. Staffordshire,		
in London	6/5/0	7/0/0
COPPER—British,		
cake and ingot	86/0/0	87/0/0
Best selected ..	88/0/0	89/0/0
Sheets, strong..	96/0/0	0/0/0
Chili, bars	79/10/0	0/0/0
YELLOW METAL.ib.	0/0/6	0/0/6½
LEAD — Pig,		
Spanish.....ton	12/12/6	12/15/0
English, com.		
brands	12/15/0	12/17/6
Sheet, English,		
3 lbs. per sq. ft.		
and upwards ..	14/15/0	0/0/0
Pipe	15/5/0	0/0/0
ZINC — English		
sheet .....ton	26/15/0	0/0/0
Vieille Mon-		
tagne	26/15/0	0/0/0
TIN—Straits	90/10/0	0/0/0
Australian	90/15/0	0/0/0
English Ingots	94/10/0	0/0/0
OILS.		
Linseed .....ton	21/17/6	22/5/0
Cocoanut, Cochin	34/10	34/10
Do. Ceylon	25/5/0	0/0/0
Palm, Lagos	25/0/0	0/0/0
Rapeseed, English		
pale	30/10/0	0/0/0
Do. brown	28/10/0	0/0/0
Cottonseed ref...	20/15/0	0/0/0
Olive	41/15/0	24/0/0
Lubricating, U.S.	5/0/0	6/0/0
Do. refined	8/0/0	12/0/0
TAR — Stockholm		
barrel	0/19/6	1/0/0
Archangel	0/13/0	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than 12 noon on Thursdays.*]

ASH.—For drainage works at Ash, Kent, for the Eastry Rural Sanitary Authority. Mr. C. H. Belse, engineer, Westminster :—

Hunter & Bryant.....	£5,143	Home	£4,199
Coker	4,743	Lloyd	4,069
Lovell	4,600	D. & T. Denne ...	4,000
Osenton	4,475	Denne & Son, Deal*	3,888
Hayward & Faramor	4,398	Trollope (withdrawal)..	2,787
Wise	4,278	* Accepted.	

BELVEDERE (Kent).—Accepted for the erection of eight workmen's dwellings at Stapley-road, Belvedere, Kent, for Mr. W. Vinson. Mr. G. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C. :—

T. Knight..... £1,389 0 0

[No competition.]

BOURNEMOUTH.—For the erection of new Borough Offices, Bournemouth. Messrs. Lawson & Donkin, architects, Shaftesbury Hall-chambers, Bournemouth :—

J. White, Bournemouth (accepted) £4,600

BOURNEMOUTH.—For the erection of residence, Branksome park, for Mr. H. Aldridge. Messrs. Lawson & Donkin, architects :—

T. B. Knowles	£2,750	C. Shears & Son	£2,330
Barrow & Entwisle.....	2,720	J. White, Bournemouth*..	2,300

* Accepted subject to its reduction.

BOURNEMOUTH.—For alterations and additions to No. 103, 61 Christchurch road, Bournemouth, for Mr. Bridge. Messrs. Lawson & Donkin, architects :—

J. White	£425	Jenkins & Sons, Bourne-	
Barrow & Entwisle	420	mouth (accepted)	£395

BOURNEMOUTH. For alterations and additions to stables, for the Bournemouth, Boscombe and Westbourne Omnibus Company. Messrs. Lawson & Donkin, architects :—

F. Hammett	£472	W. Scott	£444 19
Barrow & Entwisle.....	450	W. H. C. Curtis	335

BOVEY TRACEY (Devon).—For the execution of water supply works, Bovey Tracey, for the Newton Abbot Union Rural Sanitary Authority. Mr. S. Segar, engineer, Union-street, Newton Abbot :—

Shaddick	£1,497	Parker Bros.....	£1,275
Valentine	1,497	Best	1,269
Jenkins & Son	1,465	Hawkings & Best,	
Mardon.....	1,395	Teignmouth*	1,265

* Accepted.

BOVEY TRACEY.—For the erection of a dwelling-house and blacksmith's shop, Bovey Tracey, Devon, for Mr. J. Moore. Mr. Samuel Segar, architect, Union-street, Newton Abbot :—

Barrow.....	£396	Pomeroy	£297
Zealley	378	Davie & Palfrey, Bovey	
Wimser & Turner.....	298	Tracey (accepted)	280

BRAMPTON (Cumberland).—For the erection of a bridge over the River Cairn, in the parishes of Hayton & Cumwhitton, for the Brampton Rural Sanitary Authority. Mr. Isaac Noble, Surveyor, Union Office, Brampton :—

Thomas Teder, Langholm, Scotland (accepted) .. £243 10 0

BRENTFORD.—For making-up eastern portion of Lateward-road, for the Brentford Local Board. Mr. J. H. Strachan, Surveyor :—

Nowell & Robson .... £377 0 0 | John Ball, Chiswick* £233 12 4

* Accepted.

BRENTFORD. For making-up Starrage-road East, for the Brentford Local Board. Mr. J. H. Strachan, Surveyor :—

	Per Yard.
J. Horsford & Co., Faversham	5s. 4d.
G. Pearce, Brentford (accepted)	5 4

BRENTFORD.—For delivering on wharf 800 yards of Kentish pit flints, for the Brentford Local Board. Mr. J. H. Strachan, Surveyor :—

	Per Yard.
J. Horsford & Co., Faversham	5s. 4d.
G. Pearce, Brentford (accepted)	5 4

BRENTFORD.—For delivering on wharf 1,800 yards of broken Guernsey granite for the Brentford Local Board. Mr. J. H. Strachan, Surveyor :—

	Per Yard.
Tyack & Sons	15s. 0d.
Griffiths	15 6
Maundrell	15 3
Jennings	15 3
Nowell & Robson	15 1
Mowlem & Co. (accepted)	14 11

BRIGHTON.—For the erection of a clock tower in Preston Park. Mr. Francis J. C. May, Borough Surveyor, architect :—

G. R. Lockyer	£1,631	V. P. Freeman	£1,296
J. T. Chappell	1,370	Longley & Co.	1,295
J. Barnes	1,344	Patching & Son, Brighton*	1,283
J. J. G. Saunders.....	1,319	* Accepted.	

[Exclusive of the cost of the clock.]

BURNHAM (Somerset).—For the erection of a new building, comprising reading, billiard, smoking, and caretaker's rooms, &c., for the Committee of the Burnham Institute. Mr. F. Castle Gant, architect, Alfred-street, Burnham :—

		Extra for Bay-windows.
G. Randell	£549 0 0	£566 0 0
J. Keats (accepted) ..	495 0 0	529 0 0
.....	.....	.....

CANNOCK.—For erecting a covered way, bath and lavatories, for the aged and infirm women's ward, and painting, &c., at the Union Workhouse, Cannock. Mr. J. R. Veall, architect, Wolverhampton :—

Bradley & Co.	£280 0 0	Gough, H.	£268 18 5
C. Linford.....	240 0 0	J. Reynolds, Cannock*	204 0 0
A. Gilbert	214 1 9	* Accepted.	

CROYDON.—For erecting Polytechnic Institution in the Scarbrook-road, for the Croydon Corporation. Mr. George Frisch, architect, 54, Cannon-street, E.C. :—

Akers	£1,100	Bullock	£2,407
Bryan	2,070	E. J. Saunders	2,398
Smith & Sons	2,057	G. H. Martin & Co., West	
Bailey & Linfoot	2,040	Croydon	2,38
Barker	2,700		

FAREHAM (Hants).—For the erection of shops, &c., West-street, Fareham, for Misses Howard. Messrs. Lawson & Donkin, architects, Bournemouth :—

J. Plummer	£815 0 0	G. H. & A. Blackman,	
E. Tutte.....	715 0 0	Fareham*	£619 0 0
J. Gamblin	648 17 9	* Accepted.	

FOOT'S CRAY.—For the erection of twelve workmen's dwellings at Foot's Cray, Kent. Mr. G. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C. :—

T. Knight	£2,747	C. Stebbings*	£2,395
Somerford & Son.....	2,578	W. Owen (withdrawn)	2,016

* Accepted with modifications.

HEREFORD.—For additions to the "Grange," Hereford, for Mr. G. H. Godsell, architect, Hereford :—

W. B. Lewis & Co.	£135 10 0
R. Andrew & Son, Hereford (accepted).....	132 15 0

LAMPETER. Accepted for building lodges' lodging and residential house at Lampeter, for Mr. David Lloyd, Peterwell. Mr. D. Jenkins, architect, Llandilo :—

D. Evans & Sons, Llanddewi-brefi £2,050 0 0

LEDBURY (Hereford).—For alterations and additions to Brousil House, near Ledbury. Mr. G. H. Godsell, architect, Hereford :—

W. P. Lewis & Co., Hereford (accepted) £1,650 0 0

[Lowest of three tenders.]

LEEDS.—Accepted for the erection of Mission Hall, at Hare Hill's road, Leeds, for the trustees. Messrs. John Hall & Son, architects' 39, Albion-street. Quantities by architects :—

Bricklayer and Mason—W. & H. Lane	£500 0 0
Joiner and Carpenter—B. Mawson	230 0 0
Plumber and Glazier—J. W. Wilson	103 0 0
Slater—T. E. Heavyside	76 18 0
Plasterer—R. Scatcherd	57 0 0
Painter—W. Grisdall.....	18 17 6
Hot Water—Thomas Green & Sons, Limited.....	63 0 0
	£1,028 15 6

[All of Leeds.]

LEEK.—For alterations to houses at Leek. Messrs. W. Sugden & Son, architects. Accepted tenders :—

For Mr. W. Johnson—Knowles, W. Hudson, and G. T. Stevenson, £479.

For Mr. Jno. Sheldon—G. T. Stevenson, £115; and Herbert Hall (day-work).

LEICESTER. For the erection of a block of ten almshouses on the Clarendon Park-road, including laying-out grounds, drainage, water supply, &c. Mr. J. R. Veall, architect, Wolverhampton :—

H. Willcock	£1,749	T. Bailey & Co.	£1,555 0 0
H. Lovatt	1,612 8 8	T. Harris	1,543 6 0
T. & H. Herbert	1,501 10 0	J. O. Jewsbury,	
Hutchinson & Son ..	1,671 17 6	Leicester (accepted)	1,491 10 0

LLANDILO.—Accepted for building a dwelling-house at Crescent road, Llandilo, for Messrs. Thomas & Sons, Llandilo. Mr. D. Jenkins, architect, Llandilo :—

Alfred Meredith, Newbridge-on-Wye £900 0 0

LLANDILO.—Accepted for building a pair of semi-detached cottages at Rhosmaen, Llandilo, for Dr. Lloyd Morgan, Rhosmaen. Mr. D. Jenkins, architect, Llandilo :—

Alfred Meredith, Newbridge-on-Wye £310 0 0

LONDON.—For the erection of three houses at Gayford-road, Starch Green, for Mr. S. Fortescue. Mr. J. H. Richardson, architect :—

Wilkinson.....	£1,100 0 0	Lyford	£990 0 0
Boarder	1,040 0 0	Lund (accepted)	748 17 6
F. R. Toser	1,028 0 0	* Accepted.	

LONDON.—For the erection of dwellings, Silver-street, Goldenscare Lane, Bangstead, for Mr. Henry Humphreys. Mr. Albert E. Prilmore, architect, 2, Broad street buildings, E.C. Quantities by Mr. Alfred Griggs :—

R. Gates	£1,397	0	Wiltshire £890 0
Taylor & Son	1,247	0	H. King & Co. 876 10
Pearce & Ellis	1,149	0	Lundy & Co.* 830 0
W. A. Hudson	1,097	0	* Accepted.

LONDON.—For building house and boundary-wall at Prior-street, Greenwich, for Mr. Jennings. Mr. R. Crosse, architect :—

Kirk & Randall	£349	0	Gorham £423 15 0
A. W. White & Co....	339	0	Martin 420 0 0

LONDON.—For repairs and painting to three houses, Suffolk-street, Rotherhithe, for Mr. Johns. Mr. E. Crosse, architect :—

Almond	£140	0	0 Smithers £118 10 0
A. W. White & Co.	128	0	0

LONDON.—For pulling down and rebuilding the "Jolly Sailor" public house, Lower-road, Rotherhithe, for Messrs. Courage & Co. Messrs. Stock, Page, & Stock, architects. Quantities by Messrs. Widnell & Trollope :—

Jocelyn & Co.	£2,740	J. Down	£2,550
W. & H. Castle	2,649	Holloway	2,543
A. W. White & Co.	2,579	B. Wells	2,530

LONDON.—For the erection of factory at Huxton Market, Shoreditch, N., for Messrs. Ernest Smith & Sons. Mr. John Job Wood, architect and surveyor, 4, Khyber-road, Battersea, S.W. :—

Bowyer	£2,197	Nightingale's	£1,849
Barker.....	1,890	Turtle & Appleton	1,745

[Architect's estimate, £1,975.]

LONDON.—For repairs, &c., at the "Prince Alfred" public house, Lower Sydenham. Mr. F. West, architect :—

Bryan & Son	£245	0	Gardiner & Llewllyn .. £210 7
Watson & Son	219	10	Waddington & Co. 203 0

LONDON.—For stabling, workshops, &c., in rear of the "Royal Oak," New-road, for Mr. Loader. Mr. Henry H. Church, architect, Woolwich :—

Proctor	£480	Multon & Wallis*	£404
Hutton	428	* Accepted.	

LONDON.—For re-building No. 71, New-road, Woolwich, for Mr. J. Glover. Mr. Henry H. Church, architect, Woolwich :—

Multon & Wallis..... £325 | Coombs (accepted)..... £478

LONDON.—For stabling, workshops, stores, and van sheds, in Union-street, Woolwich, for Messrs. Garrett & Co., Limited. Mr. Henry H. Church, architect, Woolwich. Quantities by Mr. W. H. Strudwick :—

Allen & Sons.....	£2,395	Multon & Wallis.....	£2,098
Kirk & Randall	2,192	Dabbs	2,338
Jerrard	2,129	Munday & Sons	2,016
Morter	2,106	H. L. Holloway*	1,945
Chapman	2,043	* Accepted.	

LONDON.—For works at the Middlesex Music-hall, Drury-lane, Nos. 3, 5, and 7, Shelton-street, and Nos. 163 and 169, Drury-lane, for Mr. J. L. Graydon. Mr. Alfred Wright, architect and surveyor, 61, Kennington-road, S.E. :—

J. Marsland	£5,295	F. Wheller	£4,830
Leslie & Co	4,950	Allen & Sons.....	4,770
Johnson & Co., Limited ..	4,950	J. Tyerman	4,637
Pocock Bros.....	4,886		

LONDON.—For erection of schools for 310 children, at Pembroke road, Kilburn, for the Rev. M. J. Shinmeirs. Mr. Richard D. Hansom, architect, The Red Tower, Kilburn. Quantities by the architect:—

Cowley & Drake	£7,050	Stimpson & Co.	£2,895
H. B. Oldrey	2,899	George Neal	2,711

LONDON.—For the erection of new billiard room and bar alterations at the "Golden Horse," Forest-lane, Forest-gate, for Mr. H. Cajus. Mr. A. W. Cosby, architect, 150, Osborne-road, Forest-gate.—

Walker	£676 0 0	Littlebury	£575 0 0
Painter	548 13 0	Whitty*	570 0 0
Ling	477 0 0	* Accepted.	

LONDON.—For pulling down and re-building Nos. 1 and 2, Kingsstreet, Cotton-street, Poplar, E., for Mrs. Lewis. Mr. W. Brown, surveyor, 11, Gt. Ormond-street, W.C. (accepted) £995 0 0

(Not completed.)

LONDON. For the erection and completion of four houses at Forest-gate. Mr. C. E. James, architect, 18, Grove-road, Victoria-park.

Symonds	£1,480	North Bros.	£1,376
G. Barker	1,240	Boney	1,315
Hoskins	1,197	Everett	947

LONDON.—For erecting new Superintendent's House, Battersea Park, for the London County Council. Mr. Thos. Blashill, Architect:—

Garrett & Son	£750 0 0	Rowe Bros.	£837 0 0
Akers & Co.	800 0 0	Lofthouse & Co.	827 0 0
Willis	814 0 0	Lesli & Co.	809 0 0
Lyle	808 0 0	Hammond	777 0 0

LUSTLEIGH.—For the erection of Lodge at Lustleigh, for Mr. J. Elliott. Mr. Samuel Segar, architect, Union-court, Newton, Abbot:—

J. Pinsent	£ 5	Davie & Palfrey	£192
Zealley	2	Call	143
Gaulton	2	Parker & Son, Lustleigh*	136
Winser & Turner	28	* Accepted.	

NEWTOWN (N.W.).—For the erection of classroom and other works to the Infants' School, Newtown, for the School Board. Mr. Edward Parker, architect. Quantities by the architect:—

E. Davis & Son	£794	Mould & Sons	£784
J. Wiltshire	28	[All of Newtown.]	

NORTON-IN-THE-MOORS (Stafford).—For new infants' school at the National Schools. Messrs. Ralph Dain & Son, architects, Hanley:—

J. Mort	£318	G. G. Dunn, Burslem (ac-	
J. J. Longson	305	cepted)	£300

ST. LEONARDS.—For erecting residence and stables on the Filsham Estate, St. Leonards-on-Sea, for Mrs. W. F. Hunt. Messrs. Epworthy & Son, architects, St. Leonards-on-Sea. Quantities by the architects:—

	House.	Stable.
E. Boniface	£2,650 0	£484 0
H. Crattenden	2,588 0	474 0
C. Hart & Son	2,585 0	470 0
Eldridge & Cruttenden	2,571 0	700 0
F. Jenkins	2,497 7	454 13
C. Hughes	2,480 0	440 0
A. H. Wheatley (accepted)	2,447 0	428 0

SHERBORNE.—Accepted for the erection of a printing factory in the Yeovil-road, Sherborne, after alterations and additions specified, for Messrs. J. C. & Alfred Stratton. Mr. Thomas Farrell, architect, Newland, Sherborne:—

Lye & Son, Crewkerne, Somerset	£953 0 0

[Four other tenders received.]

SILVERTOWN.—For the erection of new warehouse, Tay Wharf, for Messrs. Jas. Keiller & Son. Mr. J. O. Cook, architect, 14, Eleanor-road, Walthamstow. Quantities by Mr. C. W. Brooks, 52, Finsbury-pavement, E.C.

Albert & Lutt	£4,110 0	W. Harris	£4,794 17
Smith & Sons	4,633 0	J. O. Richardson	4,568 0
Mutton & Wells	3,820 0	H. Stiff	3,600 0
Woodward & Co.	3,798 0	Kirk & Randall, Wool-	
H. L. Holloway	3,780 0	wich (accepted)	3,212 0
Thos. Little	3,670 0		

WEST HAM.—For paving the High-street, Stratford, from Martin-street to Bridge-road, for the Corporation of West Ham. Mr. Lewis Angell, Minst. C.E., Borough Engineer, Town Hall, Stratford, E.:—

	As per schedule.
G. G. Rutty	£2,552 18 10½
Turner, Son, & Evans	2,077 3 3
W. Griffiths, Kingsland (accepted)	2,056 7 4½

WIDNES.—For the erection of a cart-shed, for the Widnes Loco Board. Mr. J. S. Sinclair, Surveyor, Widnes:—

Sayce & Randle, Widnes (accepted)	£187 17 5

WIDNES.—A capital list for excavating, patching, sewering, paving, flagging, &c., certain streets for the Widnes Local Board. Mr. J. S. Sinclair, Surveyor, Widnes:—

Cowburn & Hayes	Contract No. 1	£2,968 1 0
Bedford Leigh	Contract No. 2	1,898 1 0
Peter Butterfield	Contract No. 3	1,146 11 0
Aintree, Lee, & Co.	Contract No. 4	1,096 10 0
Ibbs	Contract No. 5	742 10 3

WOLVERHAMPTON.—For reinstating warehouses and offices at the Crane Foundry, Hanley fields, partially destroyed by fire. Mr. J. R. Veall, architect, Wolverhampton:—

Beesley & Co.	£650	H. Will (accepted)	£635
H. Lovatt	647	H. Gough, Wolverhampton*	620
	* Accepted.		

WOLVERHAMPTON.—For the erection of a villa at Bushbury, for Mr. A. Staveley Hill, Q.C., M.P. Mr. Joseph Lavender, A.R.I.B.A., architect, Wolverhampton:—

Mumford	£750 0 0	Bradley & Co.	£700 0 0
H. Willcock	885 0 0	H. Gough, Wolver-	
G. Cave	808 0 0	hampton*	705 0 0
B. Guest	848 7 6	* Accepted.	

WORCESTER.—For the erection of additional buildings, to accommodate 140 patients, for the Worcester County and City Lunatic Asylum. Messrs. H. Rowe & Son, architects, Worcester chambers, Pierpont-street, Worcester:—

Stephens, Bastow, & Co.	£13,600	W. Brock	£13,177
Thomas	13,500	Wood & Son, Worcester*	12,975
Baird	13,481	Hatton	12,800
Jones & Co.	13,241	Barnsley	12,750
Lovatt	13,197	* Accepted.	

WORCESTER.—For the erection of three pairs of cottages, in connection with the Worcester County and City Lunatic Asylum. Messrs. H. Rowe & Son, architects, Worcester:—

Stephens, Bastow, & Co.	£1,797	Baird	£1,595
Lovatt	1,727	Barnsley	1,520
Hatton	1,668	Thompson	1,495
Jones & Co.	1,601	Wood & Son, Worcester*	1,397
W. Brock	1,660	* Accepted.	

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Houses, Queen's-Gate, Kensington.—Mr. W. Emerson, F.R.I.B.A., Architect ..... *Double-Page Photo-Litho.*
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"*Cutler v. North.*"

PROBABLY the attention of most architects has been directed during the past week to this case, in which the plaintiff, a well-known architect, has sued the defendant for the balance of a large commission, under rather peculiar circumstances, and has received a verdict for the full amount claimed; a verdict given without hesitation by the jury. While congratulating the plaintiff on the result of the case, we may also observe that it is satisfactory, on more general grounds, to record a case of this kind in which for once the architect concerned in the case does not seem to have been regarded in a court of law as a kind of natural enemy of society, or a person against the justice of whose claims every possible presumption is to be entertained. On the contrary, it seems evident that at an early period of the case the Lord Chief Justice was favourably impressed with the claims of the plaintiff, and determined at all events to protect him against unfair imputations from the other side; and when the defendant, Col. North, ventured on the old hackneyed slander against the profession, that the architect was increasing the work in order to enlarge his commission, that no doubt "he would take care that he did not lose by it," &c., he incurred a rebuke from the bench in unusually severe terms. Perhaps even the *Times* may take a lesson from this, though that journal did not think it worth while to report the Chief Justice's comment.

The case, the heads of which are reported in another column, appears, however, to illustrate the inconvenience of hasty and unbusiness-like arrangements in regard to the carrying out of extensive building work on which large sums of money are to be spent. Colonel North is evidently a specimen of the kind of wealthy client whom many architects have had reason to know only too well; the client who is in a hurry for everything, who thinks that his will (or his wealth) is to be law, and who is ready to give magnificent orders and expect them to be carried out without the usual preparations or consideration, and when his Aladdin's palace has been raised is scandalised at the bill.

> "When we mean to build,
> We first survey the plot, then draw the model;
> And when we see the figure of the house,
> Then must we rate the cost of the erection:
> Which if we find outweighs ability,
> What do we then, but draw anew the model
> In fewer offices; or at least, desist
> To build at all."*

There is the common sense of the subject in Shakespeare's language. Here the client gives extensive orders on the eve of leaving the country; he refuses to allow time for detailed plans to be drawn from which an estimate can be made; he puts no definite limitation on the expenditure even in verbal orders (for there appears to be no satisfactory or unimpeachable evidence that he did so); he gives certainly none in written orders; so far from that, indeed, he accepts a written agreement as to the terms on which the architect's commission is to be calculated, but without inserting in that agreement one word as to the absolute expenditure to be sanctioned on the building. But when on his return he discovers that he has to pay for his palace, he is ready at once to blame the architect who has carried out his vague orders more magnificently than he had contemplated, and remembers verbal statements as to what it was to cost which other people do not remember. That is a not infrequent occurrence, and that was the ultimate position taken by the defendant in the present case; but he did not come to that all at once. There was first a mere statement by the defendant's solicitor that he had some claim for delay; that there were some things which required explaining; the recollection of the verbal estimates only comes to the front at a later period; and probably nothing did more to prejudice Colonel North's case both with judge and jury than this shilly-shally between two different grounds of defence, a procedure which obviously indicated that the plea that the architect had exceeded his authority was only an argument set up *a parte post*, when it was found necessary to have a defence against the plaintiff's action. The refusal to pay, in fact, seems to have been in reality a matter of temper rather than of any conviction on the part of the defendant that he had been unfairly used; such temper as some millionaires seem to think they are privileged to indulge. There is no pretence made that the work was not well done and not worth the money paid to the builders for it; the defendant has obtained a very sumptuous house of which he had a grand opening the other day; but he chose to indulge the luxury of a quarrel with his architect, on which the verdict has thrown very cold water.

The case, however, is not without its instructive side to architects. One moral which it suggests is not to trust too much to verbal agreements or instructions where the expenditure of large sums of money is concerned, especially when the work is to be carried on in the absence of the building owner from the country. The agreement as to the principle on which Mr. Cutler's services were to be remunerated was made in writing, and was the only piece of written agreement which passed between architect and client in connection with the matter. Had Mr. Cutler also asked for a definite limit of expenditure in writing, things would have been on a clear and business footing, though the practical result would evidently have been that Colonel North would not have obtained so good a house, as it is certain that the limit would have been put lower than was necessary for the kind of work which has been done. But we cannot help feeling also that the architect in this case fell into the weakness which is far too common in the profession, of under-estimating the probable cost of the work. The verbal estimate on his part of 30,000*l.* is denied by him, and we take it as proved that he did not name that sum, and that it is only a theory evolved by the defence; the nearest we get to it in the evidence is that some one else suggested that sum in the architect's hearing and that the latter, it is implied, did not contradict it; but even this seems doubtful. But it does appear that the plaintiff, after sketching out the ground plan, and being asked as to the probable cost, answered roughly "about 40,000*l.*, but that he could not really calculate without full plans and contracts and specifications;" so the Judge puts it, and therefore evidently he re-

* Henry IV., Part II.: Act I.: scene 3.

garded that as admitted. Of course every one understands that it would be most illogical to ask an architect to give anything like a close estimate on such sketch-plans. But unless the whole projected scheme was very materially extended afterwards (of which there seems to be no evidence), it appears to us, considering the actual cost which it did amount to, that on the basis of sketches an architect should have been able to come nearer to a suggestion of the actual amount to be expended than that. Mr. Charles Barry stated in evidence that he had seen (as we understand) the same sketch-plans, and that on the basis of those he should have estimated the probable expenditure at 80,000*l*. Mr. Barry is a practical man, and his statement in that respect must have its weight. It seems to have been considered in some quarters that Mr. Barry and Mr. Chatfeild Clarke were to be blamed for appearing as witnesses against a brother architect; remarks of that kind have reached us. We presume people who think so never read reports of law cases, or they would know that for members of the same profession to be summoned as witnesses on opposite sides, even in cases of disputed professional charges, is quite a common occurrence. We cannot congratulate Mr. Barry on the grudging style in which his admissions as to the plaintiff's status in the profession were made; but, on the general principle, it is hardly to be assumed that architects are never in the wrong as to their charges, and if a client is sued for what he believes to be unfair charges by an architect, what evidence is he to call but that of others of the same profession in support of his case? If a professional man is subpœnaed as a witness he has to appear; is he, then, to give evidence contrary to his judgment, in other words to tell a falsehood, to benefit a professional brother? If it appeared that the two gentlemen in question had offered themselves as witnesses or evinced an anxiety to appear in the case it would be a different thing; until we have evidence of that we should regard any such criticism as we have referred to as merely sentimental nonsense. Our impression is that the plaintiff might have come to a conclusion as to the probable cost which was nearer the mark, and that it is a pity he did not study to come nearer the mark in this respect. It does not really affect this case, because it is evident that this argument about the excess of expenditure over estimate was merely a pretence; but it gave a colour to the defence, and it cannot be denied that architects are regarded by the public (and not, we must say, without some reason) as being exceedingly prone to under-estimate the cost of buildings at starting, and anything which tends to confirm this opinion is to be regretted.

It may be observed that Colonel North, in addition to his insinuation about the architect running up the cost to increase his commission, also thought proper to make the still more serious insinuation that he had received commissions from tradesmen, concerning which the Chief Justice spoke also in very plain language:—

"There was a suggestion that Mr. Cutler had received commissions from tradesmen, a suggestion made without any foundation and which ought not to have been made by a gentleman. There was a letter of Colonel North's solicitor containing such a suggestion, which Colonel North disclaimed, and said he supposed it came from the solicitor, who, however, denied it. He was sure that no respectable solicitor would make such a suggestion without any real grounds for making it."

It is gratifying to get this expression of opinion from the highest Judge in the land, and it is to be hoped some of the people who delight in making charges of this kind will take note of the Chief Justice's observation that it is a thing "no gentleman would do." In regard to the other insinuation just referred to, we cannot help again suggesting, as we have before, that it is a pity that architects' fees should be regulated on a system which leaves a handle to people of a certain stamp to make the remark that it is always to the architect's interest that the expenditure on work should be increased. Of course there are people who will also observe that it is to the interest of lawyers to promote actions, and the interest of physicians not to cure one too quickly; and the charges in each case are perhaps about on a par in reasonableness and propriety; but the actual percentage on work done and money spent is a more patent and tangible thing to lay hold of, and there will always be persons who will lay hold of it. No doubt it has the merit of being a simple and easily-adjusted basis of remuneration for the architect, but we have always been unwilling to regard it as the final settlement of the question. There is a great deal to be said in favour of charging a fee in a lump sum, as a sculptor charges for a statue, and one of the most manifest advantages is that no one could then have any excuse for making the charge, which it must be remembered that some kinds of people will always be ready to believe, that an architect is consulting his own interests in increasing the outlay on a building.

THE RE-SANITATION OF NAPLES.

FROM AN ITALIAN CORRESPONDENT.

THE renovation of the sanitary system in Naples represents the most important municipal undertaking of contemporaneous Italy.

The cholera of 1884 attacked Naples with exceptional virulence. The mortality was stupendous. There was scarcely a family in which there had not been victims. This terrible calamity moved the hearts of Italians everywhere; all the more so because the scourge was felt, not only in the poor districts, but also in the richer ones, where sanitary arrangements ought to have been a barrier to the encroachments of the terrible malady.

Poverty is one of the scourges of Naples. There many have to sleep in the open air, because they are deprived of shelter; yet possibly those who are huddled together in certain lodging-houses where they pay from 5 to 10 cents. (½d. to 1d.) per night, are worse off. In the neighbourhood of the market there was one in which the charge was 5 cents (½d.), and in which the people slept in a seated position, or leaning their heads up against the walls, or sometimes against a rope stretched from one wall to the other.

Dr. Axel Munthe, who came to Naples at the time of the cholera to attend the poor patients attacked with the disease, in a series of letters, published at first in the *Dagblad* of Stockholm, and reprinted afterwards in a separate volume and translated into English under the title, "Letters from a mourning city" (London, Murray, 1887), has given heartrending descriptions of the misery of Naples during the time of the cholera in 1884.

Amongst other things, Dr. Munthe remarks that during the cholera fires were burnt by the Municipality in the alleys of the different districts for the purpose of purifying the air. To find yourself in one of these alleys, says Dr. Munthe, "You might think you were in a grotto surrounded by dwelling huts crowded together, with one opening serving the double purpose of a door and window. In each of these dwell several families, and it is the exception to find fewer than five or six persons in each one." In some of the courts and alleys at Santa Lucia, situated between the houses of the wealthy or at the back of them, the people are crowded together in a way which passes the limits of human imagination. There not only are clothes-lines stretched from one house to another, but from one balcony to another, and the buildings are so close together that sometimes opposite neighbours can shake hands with one another. You can imagine what amount of air and ventilation exists in these districts. The very worst sanitary conditions contributed undoubtedly to the spread of the fearful disease which desolated Naples in 1884. But to whom, if not to the Neapolitans themselves, is the fault to be attributed? The climate of Naples, of itself, is excellent. The city is bounded on one side by the sea, and on the other by the hills. These hills, which stretch towards the west, are so near the sea that for some distance they only leave sufficient space for one road. At this spot are situated what are termed the marshes, which emit a very insalubrious atmosphere. The area of such places as these is considerable, and in many places the population is densely packed, to an extent not equalled in any other portion of the civilised world. Add to this that in some places the level of the ground does not rise above the sea level. Hitherto the rainwater has run unimpeded through the streets of Naples, and they have often become veritable torrents; so much so, that to cross at some points wooden bridges have to be erected. A system of drainage was adopted in the endeavour to remedy this serious and peculiar difficulty. But the remedy was worse than the evil. These drains not being laid at a sufficient inclination, collected together all the rainwater with the surface drainage as well as the flow from the sewers in communication with the drains, and when a season of drought came on, the air was filled with pestiferous exhalations to such a degree as to render respiration almost intolerable. The new municipality, by conducting the waters of the Serino into the city, improved the hygienic features of Naples, but these waters might have been used to greater advantage had the system of conduits been better regulated. The evil of this work consists in the fact that the pipes were inadequately laid and constructed, and, consequently, they burst from over pressure, allowing the water to filter through the joints. Now, the subsoil of Naples is hollow in some places, and in others friable, and the houses are often built of a kind of cement called Pozzolana, which, when moistened, shrinks. The stone with which the houses are constructed absorbs water, and being more porous than brick, it is necessary to construct thick heavy walls. From all these reasons it follows that when any pipe bursts the water filters through the walls, and very soon weakens the foundations of the houses, causing them to crumble and come down. When going through the secondary streets of Naples, especially where the ground is on an incline, one might naturally ask the question as to whether Naples had not been recently the victim of an earthquake. Supports are to be seen everywhere, sometimes consisting of single beams and at others of brickwork, thus showing that they are not of a temporary nature. I have thought it necessary to give this structural hygienic picture of Naples before speaking of the work of re-drainage commenced years ago, and which is now being seriously carried out.

I have already said that the cholera in Naples in the year 1884 aroused the feelings of Italians. It was natural that the Government in its turn should be moved, and that that feeling should find its utterance in the House of Parliament, where the members, who are the interpreters of the eager claims of circumstances, voted for the Bill called the "Legge di Napoli" (the Naples Bill), wherein Italy sanctioned the expenditure of 100 million *lire* for the redrainage of the magnificent city, in the hope of freeing it from any fresh misfortune similar to that of 1884. It was necessary that Naples should be redrained as soon as possible, and the Legislature were anxious to contribute thereto, and prescribed that as soon as the law sanctioning the 100 millions had been voted, a scheme should be drawn up within one month for carrying out the works, and within one month afterwards that scheme was drawn up. The Legislature also enacted that, within the term of three months from the approval of the scheme, the work of drainage should be commenced; yet it was found impossible to carry out this, for reasons which it is useless to enumerate here.

In order to give you a succinct idea of the

re-drainage of Naples, I may state that more than one-third of the city is to be renovated. If you bear in mind that Naples contains more than one million inhabitants, you will be able to calculate for yourself, without need of any commentary on my part, the great importance of the municipal works to which I refer.

It is evident here that the idea of precedence in building on the site of demolished buildings was imposed by the necessity of providing dwellings for the persons turned out by reason of the demolitions. The calculations which have been made show that during a period of ten years about 100,000 people, including the well-to-do, the middle classes, and the poor would have to be turned out of their dwellings. Hence it was agreed to divide the maximum term of the works into ten years or into five biennial periods, leaving the more extensive demolitions for the latest periods. As I have already stated, this population which has to be turned out in Naples does not consist of the poor alone, but there is also the municipal problem in Naples of providing for the construction of artisans' dwellings—that is to say, of low-rented houses, and this, perhaps, was the principal scheme to be carried out. In France, England, Germany, and Holland, and possibly to a greater extent in Denmark, very extensive studies have been made on the problem of artisans' dwellings. Every method and every system has been applied, and the main object has always been that of ameliorating the state of the dwellings by proportioning the rent of the same to the humble condition of the persons for whom they were erected. This object is rarely attained.*

Nor was it attained in Naples to the extent desired. At Naples this plan is based on a proportionate rental. An average rental is laid down of 15 to 18 Italian lire for one room and a kitchen, that is, a minimum of 10 or 13 lire, and a maximum of 24 or 26 lire. Now, many houses have gone up in value, and a minimum rental of 15 lire is what prevails in Naples, and the poor people, not being able to pay this sum, prefer to occupy old and filthy huts, or, in some cases, to sleep in the open air. Complaints therefore are general, and refer not only to the excessive rent of the houses, but also to the mode in which they are constructed. The poor people say, How can we live in these houses without any verandahs? As a matter of fact these verandahs or balconies are absolutely essential for the poor people. There they wash and dry their linen, and there they cook their meagre nourishment. The houses in Naples, which form a part of the re-sanitation system, are of three different kinds, though there is a good deal of similarity between them. The entrance is generally by means of a doorway, about 7 ft. 6 in. wide, sometimes less, situated in a court quite out of proportion to the size of the building. These buildings contain from 70 to 100 and, sometimes, 120 rooms approached by several staircases. Each floor consists of about twenty-four rooms, and on each landing, which is lighted from above, there are from four to six different entrances. Let us glance into these rooms. They consist of sets of one bedroom and kitchen, others of two, and others, again, of three bedrooms and a kitchen. The entry is through the kitchen, and, with the exception of a small passage leading from thence to the lavatory, there is no open space, no outlet except the windows, and, as I said before, windows without any balconies, although these balconies are absolutely essential for the poor Neapolitans, unless they are to live in the open air. Besides the excessive rentals, it is affirmed that the houses in Naples are built on too large a scale, and that the population ought to be more extended, and Florence is quoted as an example. A very pretty style of workmen's houses is adopted at Florence, and to this style of house I call the reader's attention. There are not more than from ten to twelve suites in each building. Some have not more than five or six. They look on to the road from the front, and out into the open country from the back. Almost all the suites of rooms have long or wide balconies or genuine covered verandahs. On the ground floor there is a spacious and airy courtyard in which the children can play. In this courtyard there is always a covered-in lavatory for the common use of the various families. They have a capital kitchen, with everything that is necessary, and for all this they only pay 1 lira per week* (about 9½d.).

One small suite of this kind consists of a bedroom and the kitchen. And it is impossible to make our poor people pay more, as they are unable to afford it out of their scanty earnings.

In order to better demonstrate the importance of the present municipal problem, I will give the financial particulars of the cost calculated in the official report presented to the Municipality of Naples in 1888:—

	Lire.
The total cost is estimated at	120,303,764.28
Divided as follows:—	
1. Indemnity for expropriations for temporary occupation and partial works	93,713,453.30
2. Buildings	11,359,153.86
3. Roadworks	7,625,513.59
4. Definite expenses inherent to the works	7,965,643.53
Total ..... Lire	120,303,764.28
With a capital of	54,716,259.49
That is to say a disproportion of ... as compared with requirements.	65,587,234.90

One peculiarity that may be interesting is this, that the municipality of Naples does not deem it convenient to undertake themselves the execution of the drainage works, either entirely or in part, but rather to entrust it to a company, or several companies, at fixed prices, regulated by a series of contract rules, which serve as guides to the tenderers. The municipality of Naples proposes, as the works become developed, to intervene by approving of the areas for the buildings, by selecting the type of houses, by supervision in the construction thereof, and by stimulating and fomenting competition. Yet all this has not conduced to bring about even a reasonable solution of the municipal problem of Naples, which, at the present time, is one of the most important in Italy.

A. M.

* It may not be out of place to note that in Germany a very interesting publication was issued in 1886, on artisans' dwellings, entitled "Die Wohnungsnoth der ärmeren Klassen in deutsche Grotzstadten und Vorschläge zu deren Abhulfe. Gutachten und Berichte herausgegeben im Anfrage des Vereins fur Socialpolitik." The work is in two volumes, and is rich in information on buildings in the principal cities of Italy, England, and France. Each city and country is studied by a special writer, and the problem is considered in all its bearings, economical, social, municipal, &c.

* It is needless to observe that here we refer to the Italian lira, which is the twenty-fifth part of a pound sterling.

NOTES.

THE debate on Mr. Sidney Buxton's clause in the new Factory Bill to raise the age of half-timers to eleven years resulted, as the readers of the daily papers have seen, in the defeat of the Government, who desired to keep the age at ten years. This was contrary to the understanding arrived at last year at the International Congress at Berlin. The most significant thing about the debate was, however, that it was openly asserted that the operatives were against the raising of the age. This was not creditable to the operatives. There is an openly-expressed wish on their part to limit the hours of labour; yet they are perfectly willing to work their children at an age which it is now admitted is too young. This is not as it should be. But it is a fact, and we cannot but regard it as showing that too much reliance should not be placed on the views of artisans; they are frequently contrary to the general welfare of their own class.

ANOTHER step has been taken towards carrying out the idea of a large exhibition at Berlin in 1895, in the form of a letter addressed by the Prussian Chamber of Commerce to its members in all parts of the kingdom. This letter begs the members to inform the Standing Committee (before July 1) of their opinion as regards the holding of a great exhibition at Berlin, for the present considering this proposed show to be a purely national one. The letter states that the Committee does not hesitate to recommend such a national exhibition on a grand scale for 1895, whilst it has doubts as to the advisability of making the scheme international. In looking through the report of the Committee's meeting on the subject we find that only one member advocated the "international" point; the other members were against international exhibitions in principle, regarding them as farces at which the visitor sees 90 per cent. inland exhibits, and only a 10 per cent. of the combined foreign exhibits, these latter not being representative to any degree worth mentioning. According to the feeling in the Chamber of Commerce, Berlin would hence be likely to have an important National Exhibition; in the Government circles of the country, however, we believe the international scheme is more in favour, the year 1898 being suggested. The Government, we believe, would be more likely to vote large sums towards an International Exhibition, as the expenditure would probably be covered by the greater profits on the railways, which are nearly all State property.

THE case of Mason *v.* Gravely, tried last week by Mr. Justice Day and a jury, should serve as a warning to persons who let houses with imperfect sanitary arrangements. The plaintiff became tenant to the defendant of a house with the extraordinary name of Cyphrenes Villa. In consequence of illness in his family after the plaintiff's tenancy began, the drains were taken up and were found to be in a very bad state. Among other characteristics of Cyphrenes Villa, under the kitchen there was a "dead" drain filled with an accumulation of filth. The bath water was discharged into it, and, of course, permeated the soil below the floor, having no outlet. We fear that this state of things is characteristic of too many villas with fine names. In the result, the plaintiff obtained 70*l.* damages from the defendant. The verdict was just, and cannot be too widely known. But we repeat that a tenant should have the drains of a house examined before he agrees to take it, and should not trust to the representation either of the landlord or of his agent. If he does so, and the drainage is bad, it is not discovered till its ill-effects have done, perhaps, fatal harm. Again, as in this case, it may not be possible to obtain redress from the landlord without an expensive law-suit.

THE country some years ago spent a large sum on what are popularly called the New Law Courts. During the last and present week, in spite of this outlay, Mr. Justice Wright has been sitting in the old hall of Lincoln's Inn, trying some of the Queen's Bench causes. If one or more Courts are constructed, it is to be hoped that the First Commissioner of Works will do nothing hastily, and nothing of a merely temporary character. But the presumption is against the matter being well carried out,—as the Law Courts are public buildings.

THE Estimates for the current fiscal year set aside a sum of 3,000*l.* (on account) for additional buildings at the Record Office, upon the Rolls estate. For these it is intended to expend a total amount of 62,500*l.* During some while past the existing accommodation has proved inadequate to public requirements. We understand that for the present some of the old houses on the western side of Rolls-yard will be re-built, and so rendered more suitable for the custody of documents. Sir James Pennethorne's original plans (1847) were for one vast L-shaped building, with a new street in continuation of Carey-street, and passing

south of Symonds Inn, along its north front; and another new street, on the return, along its eastern side, opening into Fleet-street—the latter new street to absorb the whole of West Harding-street, Trinity Church-passage, and Red Lion-court, together with part of Johnson's-court. He designed the northern wing to abut against the northern and eastern sides of the Rolls Chapel, and to range in front of the Judge's Chambers as built about sixty years ago; the south wing, having two inner courts, to extend as far as Fleet-street, where a front was deemed desirable, between the present Fetter-lane and Red Lion-court, and to take up all Fleur-de-Lys-court, Crane-court, and the Scottish Corporation Hall, since rebuilt after the designs of the late Professor Donaldson: completed in 1880. Without the inner angle was to stand the library,—65 ft. in diameter, and ten-angled on plan. The entire south wing, with an area of 54,600 ft., Pennethorne planned for the storage of records. His estimate for this building, in brick, was 175,000*l.*; and about 109,000*l.*, net, for the two new streets and the acquisition of property outside of the Rolls Estate. Pennethorne's Record Office, as we now see it, fairly corresponds in site with the northern wing of his projected design. It stands upon the Rolls Estate, which is about 3 a. 1 r. 6 p. in area, together with a small out-lying slip at the north-east corner of Carey-street. Provision is made in the same Estimates for the following charges:—1,500*l.* to complete a total of 5,000*l.* in respect of an extension of the Stationery Office; 12,850*l.* to complete a total of 21,000*l.*, for the site, and 7,000*l.* on account of 35,000*l.* for the new buildings, Patent Office. A total amount of 9,500*l.* is put down against additional accommodation for examinations at the University of London, Burlington-gardens.

IN the course of next month, by order of the Ecclesiastical Commissioners, the freehold site of St. Olave's Church, Old Jewry, will be offered for sale at the Mart. The site covers about 2,600 ft. superficial, having a frontage of 39 ft. to Old Jewry, with a return of 66 ft. along Church-court. The church itself, designed by Wren, and built in 1673-6, at a cost of 5,580*l.* 4s. 10d., will be included in the sale. It was finally closed on March 27, 1887, and the parish is now united with St. Margaret, Lothbury. The gilded ship on the vane is a relic of St. Mildred's, Poultry, also by Wren, which was pulled down in 1872. We printed two articles upon St. Olave's in our numbers of December 16, 1882, and April 9, 1887; and on February 9, 1889, we described, in a "Note," some interesting remains of the tower of the old fourteenth-century church which had then just been brought to light.

BROOKE'S-MARKET, Holborn, the insanitary condition of which the London County Council discussed last week, as reported on p. 489, *ante*, and of which the site, in part, is already vacant, consists of some old houses and detached sheds and stables, all in a wretched state as to repair, and now occupied by about sixty persons. It lies, in two rows, between Beauchamp-street (south) and the ends of Brooke- and Dorrington*-streets. The name is derived from the town mansion of Sir Fulke Greville, to whom James I. gave a grant of Warwick Castle, created Lord Brooke, of Beauchamp's Court, co. Warwick, on January 18, 1620-1. That house is marked in Ogilby's map of 1635 as situated next westwards of Furnival's Inn. It had been built for William Bourchier, Earl of Bath (whence Bath-place), who died in the year 1623. Greville deserves to be remembered for his generous encouragement of learning and men of letters. Highly in favour at Court, his chief boast was to have been the friend of Sir Philip Sydney, who was his schoolfellow at Shrewsbury under Thomas Ashton. He was killed at Brooke House by his servant in 1628, and was buried at Warwick, under a monument he had erected, and bearing the well-known inscription. In Nicholas Stone's account-books, at the Soane Museum, we find these entries:—

"and In 1622 I mad ye great diall in ye prevy garden at Whit Hall for ye wich I had 46*l.*: and that yeare 1622 I mad a diall for my lord Brook in holbron for ye wich I had 8*l.* 10s. 0d."

Recent extensions northwards of the Prudential offices* (Mr. A. Waterhouse, R.A., architect) and of Wood's Hotel (Messrs. Isaacs & Florence, architects), have supplanted the old "George" tavern, and most of the houses along the southern side of Greville-street, whereof the backs are drawn in the Sutton Nicholls view, *à vol d'oiseau*, made for Strype's edition of "Stow" in 1750. Nearly the whole of Brooke-street has been re-built of late years, including the house near the opening of Fox-court, on the western side, in the garret of which Chatterton ended his life.

* A corruption of Doddington. Robert, fourth Lord Brooke, married Annie, sole heir of John Doddington.

THE Tubular Frame Wagon Company have commenced despatching bogie-trucks from their works at Barrow to various countries. We believe that the one supplied to the Great Northern Railway early this month was the first of the kind entirely constructed in this country, but several have since been sent to Ireland and Spain. Mr. Jefferds has met with considerable opposition while endeavouring to effect their introduction into this country, having had several fresh antagonists since he read his paper before the Institution of Mechanical Engineers last year,—one hailing from China, and others even from America. All objectors are met with a characteristic confidence and boldness, one spirited letter concluding as follows:—"To nullify all adverse statements in regard to this rolling-stock, I propose to invite the principal carriage and waggon superintendents of the United Kingdom to witness the building of one of these cars at our own works at Barrow, and to see it tested in every way, and then break it down, so there will be no question about their merits or cost of repair." As the Great Northern, the Waterford and Limerick, and the Great Northern of Ireland are now supplied with samples of these waggons, we shall probably hear before long to what extent the confidence thus expressed is justified. As to the financial side of the question, it is inconceivable that in these days English managers would allow simple prejudice to stand in the way of anything that promised to reduce their working expenses. Mr. Acworth, for one, ridicules the statements as to the economy to be effected. Taking for a text Mr. Jefferds's assertion that "fully 67½ per cent. can be saved in the working expenses of British railways by discarding four-wheeled rigid waggons, and adopting a proper bogie truck," he says:—"The working expenses of British railways amounted in 1889 to 30½d. per train-mile. A reduction of 67½ per cent. would bring them down to 10d. Now, according to the Board of Trade returns, general charges, Government duty, compensation, legal, Parliamentary, and miscellaneous expenses, amounted to something over 4¼d. The shape of the goods trucks could hardly produce any effect in reducing these items. We are left, therefore, with a sum of 5¾d. to cover an expenditure which, under our present antediluvian methods, amounts to 2s. 4d. Let us admit that the new trucks run so easily that locomotives would be a superfluity, that they glide so smoothly over the ground that the road would never wear out, and that the bridges would never need repainting or repointing, even so we should save about 16⅔d., and we have got to effect an economy of 20⅓d."† Mr. Jefferds attempted to prove too much, but there would undoubtedly be a certain amount of saving effected in haulage of mineral traffic in large and constant quantities.

* See *Builder* for May 8, 1886.
† "The Railways and the Traders."

A SECOND view by Samuel Scott of Labelye's Westminster Bridge (opened in 1750), with the river-side, looking south-west, has just been added to the National Gallery. This painting was bought out of the Richard C. Wheeler bequest, and, if we mistake not, was included in Lord Lonsdale's collection as sold at auction in June, 1887. It is larger than the artist's other picture of the same subject,—engraved by P. C. Canot in 1760, and formerly in the Vernon collection,—whilst the view is wider, extending from the Abbey to the end of Buckingham-street, by the Adelphi. Prominent in the middle distance are the engine-house and octagonal wooden tower, 70 ft. high, of the York-buildings waterworks, known as the "Dragon," constructed by Savery in or after 1712, and disused in 1731.* This picture shows a party about to take boat from York Gate stairs. The drawing of the Gate is remarkable in one or two respects. Only one lion,—that to the right, couchant, but without a shield,—appears; the right wing of the gate has a rounded roof, tiled over, and has a glazed window inserted in the side as though that portion of the structure were used as a store-house or room of some kind. The Gate now has a corrugated iron roof. In 1679 Sir Edward Hungerford obtained a charter to convert his house and gardens by the water-side into a market. In 1830 the old buildings seen in the picture were cleared away for new market premises, with an embankment, designed by William Fowler (architect also of Covent-garden-market), and which again have given place to the railway terminus. Scott, who died in 1772, was one of the four friends who accompanied Hogarth in the five days' tour down the river into Kent in 1732. Theodosius Forrest's MS. journal of the tour is preserved in the Print Department, British Museum, and contains the map drawn by John, son to Sir James Thornhill, and the eight coloured sketches made by Hogarth and by Scott. The latter drew a view of the Medway from Rochester (old) bridge, Sheerness and the party's embarkation from the Isle of Grain, and the Spanish Ambassador's tomb in Minster church. Of the two houses at the end of Buckingham-street we gave a short account in a "Note" on March 1 last year. The house occupied by Pepys (at the south-western corner of the street), of red brick, with pediment, and dormer roof, is shown in Scott's picture, and in that by W. James, at Hampton Court. Its present successor, of yellow brick, and with different fenestration, appears in Turner's water-colour (date unknown) and in T. Malton's print of 1795.

* The tower remained many years later. There is a water-colour drawing of it by Turner in the Gallery

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PORTRAITS of Rousseau, by Allan Ramsay; of Rolland of Gask, by Raeburn; of J. R. Opie, R.A., by himself; a Dutch interior, by David Teniers; and a Classical subject, by David Scott, have been added to the Scottish National Gallery. Ramsay's portrait of Jean Jacques Rousseau is said to be the only likeness of the gifted Frenchman taken from life. Rousseau when on a visit to David Hume, the Scottish historian, in 1766, was induced to sit to Ramsay, but took umbrage at the artist, and refused to give a sufficient number of sittings. The painter, however, determined to complete the work, and followed Rousseau to public meetings, where he took sketches which enabled him to finish the work to his own satisfaction. The portrait is a half-length, and represents the French philosopher in a dark brown Armenian dress, trimmed with fur, and wearing a black fur toque. The figure is that of a somewhat fragile individual, the face clean shaven and sharply cut, with brilliant brown eyes. The picture, which is in excellent preservation, was presented by Mrs. Agnes M. Hume, grand-niece of the historian, to the late Lord Wood, from whose grandson it has been acquired for the gallery. Rolland of Gask is depicted by Raeburn in life-size, seated at a writing-table.

It is a fine example of Raeburn's art, and is in a scheme of colour very seldom used by the artist. The tone is adapted to the green upholstery and hangings of the library in which the subject is seated. Rolland was an advocate, and is stated by Lord Cockburn to have been the original of Pleydell in Scott's "Guy Mannering." The "Dutch Boors drinking," by Teniers, is a characteristic example of the realistic treatment of low life by the Dutch school of painters. The figures are full of character, and the colour rich and harmonious. Opie has painted a portrait of himself, without any attempt at producing a flattering likeness, as artists are naturally disposed to do in such circumstances. The features are heavy, but the forehead is high, and the general expression indicative of resolution. The works of David Scott are peculiar alike in drawing, colour, and expression, and the example added to the gallery is no exception to the rule. The subject depicted is Philoctetes left on the island of Lemnos by the Grecian fleet on its way to Troy. The anguish of the old Argonaut is reflected in the dull blue and green of the landscape, the general effect being the reverse of attractive.

ACCORDING to the Russian daily press, the President of the "Palestine Committee," the Grand Duke Sergius, has obtained permission from the Czar to have the often-proposed Russian Archæological Expedition to Palestine and Syria organised, the purpose of this expedition being research among the early Christian and Byzantine monuments in the district. Attention is to be mainly fixed on work of the third to the sixth century. It is considered that the work proposed will take fully fifteen months to do. As none of the archæologists who intend taking part in the expedition are able to absent themselves from home for so long a period, the expedition is to be divided into three successive ones of about six months' duration each. The district to be visited includes part of Syria, the trans-Jordan district, Petra, and Palestine. The first of the three parties leaves St. Petersburg in August, and will work in Palestine and Petra. This party will be under the head Curator of the "Hermitage" Museum, Professor N. P. Kandakow, together with Professor J. W. Pomjalowski, of St. Petersburg, and Professor A. Olessnigki, of the Kiew Theological College. A large staff of junior "savants" and subordinate assistants accompany this party, which will be supplied with large photographing apparatus and photometrical instruments.

THE walls of the larger of the two rooms at the Fine Art Society's are now hung with a large number of drawings by Mr. Walter Crane. Many—in fact most—of them are old friends, and have been noticed on former occasions. The exhibition, however, shows in a very interesting way how busy and versatile Mr. Crane has been for the last five-and-twenty years. The early children's books—some of the first efforts to raise that class of book to a higher level of artistic excellence—are perhaps among the most interesting. If the colouring is in some cases a little forced, the general simplicity of the designs, particularly where animals are introduced, is very happy, and calculated to succeed in producing a lasting impression on the infantile mind, where a more elaborate treatment would have failed. Such subjects as "The Three Bears," "Puss in Boots," "Bluebeard," and the "Noah's Ark A. B. C." occur in this series. Near these on the same wall are some very charming tail-pieces for Grimm's "Household Stories." These, and also two frames of drawings for "The Book of Wedding Days," and some of the original drawings for "Pan-pipes," strike us as being among the most successful of the purely decorative designs in pen-and-ink in the collection. Mr. Crane is, we think, less happy in his larger subjects, and one of the latest of his works "The Triumph of Labour" appears too crowded and rather "woolly." A fine contrast to this is the sketch in white on brown paper for the picture of the "Chariots of the Hours," one of the best drawings of its kind in the room. There are several large oil paintings, but the hanging of these amongst the black and white drawings is hardly good. The "Bridge of Life" at the upper end of the room is distinctly in advance of the others. Over these drawings are exhibited some of the designs now so well known for wall-paper and gesso-panels, and on a stand in the centre of the room is some pottery by Messrs. Maw & Co. which has been made from Mr. Crane's models and decorative sketches.

DESPOTIC Governments have often done a great deal for art, but their influence is not always so satisfactory. It appears that a portrait of Field Marshal von Moltke, by Madame Vilma Parlaghi, had been twice refused by the hanging committee of the Berlin Exhibition, of course on purely artistic grounds. The Emperor, however, has now peremptorily ordered that it should be hung, and in the "salle d'honneur" too!

THE late Charles Keene's delightful drawing of the rich tradesman furious at having had pictures "done by 'and" substituted for the "chromios" he had ordered, is evidently no unreal fancy, even in these days of the universal diffusion of "high-art." "A few days ago," a correspondent writes, "while looking round a shop devoted to the sale of 'art' grates and mantel-pieces, the shopman invited me to look at a brass stove-front: 'A very fine piece of casting, Sir.' It contained a panel-subject, not unpleasing in design, worked up with punch and graver from a cast ground; but, on my happening to remark as much to the man, he was quite aggrieved; he thought I was finding fault with and disparaging his wares, and assured me most positively that it was 'all cast—entirely cast-work,' &c.; and asked me, if I doubted it, to look at another casting of the same design in iron, which would certainly show my mistake. A glance at the iron front,—which was, indeed, from the same design, but an untouched casting,—showed only more clearly what part of the decoration of the brass one had come from the mould and what part had been added; but it would have been useless to press the point. The mere suggestion of 'hand-work' had caused so much indignant expostulation that, fearful lest worse should befal me, I hurriedly left the shop, my ears filled with the sorrowful echo: 'cast! cast! cast!'"

IT is satisfactory to note that our great musical function, the triennial Handel Festival at the Crystal Palace, is as successful this year as ever, so far as the first two days were concerned; the third performance on Friday will not take place till after the publication of this number. On Wednesday, the "Selection" day, there was a very full attendance, and a programme including many fine things which are rarely heard, among others one of the series of anthems which Handel wrote for performance at the chapel of the Duke of Chandos, at Cannons. Great enthusiasm was excited by some of the composer's long-forgotten instrumental works, especially the overture to the opera of "Giustino." So many of our architectural readers take interest in music that they will pardon the digression of a word as to a musical performance of such exceptional and national character as the Handel Festival.

COMPETITIONS.

ST. PETER'S SCHOOLS, MANCHESTER.—The *Manchester Courier* says that the designs of Messrs. Smith, Woodhouse, & Willoughby, architects and surveyors, of Manchester, for St. Peter's new day and Sunday schools, have been accepted by the committee, aided by an assessor, out of a limited competition.

ODD-FELLOWS' HALL, STAFFORD.—In the open competition for an Odd-Fellows' Hall and premises at Stafford, the Committee have, we hear, selected the design submitted by Messrs. Quilter & Wheelhouse, of London.

ARCHITECTURE AT THE ROYAL ACADEMY.

CONCLUDING NOTICE.

1,910. "Langdale Chase, Lowood;" Messrs. Ball, Lee, & Pattinson. This is a beautifully-executed and most effective pen drawing, showing a large mansion under a hill in a wooded landscape, with a spacious balustraded terrace in front of it; but the design is not very picturesque, nor the detail very refined. Finials terminating in stone balls abound everywhere. The salient point of the house is an octagon tower at the angle, with an ogee-shaped cupola over it, and large heavy finials with ogee terminations round the parapet. The drawing is well worth looking at, as a drawing; it is a good deal better than the design was worth.

1,911. "New College, Oxford;" Mr. Basil Champney's. Another of Mr. Davison's drawings, showing some new buildings to the college, in which the quiet semi-domestic expression of the old Oxford collegiate buildings is well kept up.

1,912. "Mosaics in St. Mark's, Venice;" Mr. R. T. Blomfield. A very delicate little coloured drawing which does not convey much of the texture of mosaic (difficult to do on so small a scale), but gives the general expression and style of the work admirably. The flat draperies seem built up in geometric patterns, in a manner peculiarly suited to the style of mosaic work.

1,914. "New Vestry, Church of St. Luke, Leek;" Mr. Gerald C. Horsley. This is a firmly-executed pen-line drawing, but there is nothing to show except a wall and a door and a window in Gothic style, and of very ordinary detail. Surely there should be more of subject in a drawing to justify its being hung at the Academy.

1,915. "Design for Church on the Regent's Canal;" Mr. John Belcher. The exterior view is a small edition of one which appeared in a former exhibition, to which is added an interior view, showing a solidly-designed vaulted stone church with an aisle of passage at the side, the deep internal buttresses crossing it entirely, and leaving large bays above with only a small door for passage in the massive wall of the buttress. The aisle below has an arcade between it and the central area. The transverse ribs of the vaulting spring from the buttresses at a lower level than the rest of the vault, leaving a solid spandrel and giving them somewhat the expression of being stone principals. It is a pity this church should not be built, for it would make a very interesting and unusual building.

1,916. "St. Clement's Church, Bournemouth: new tower;" the late J. D. Sedding. This is a kind of companion drawing to No. 1,887, as both show the tower from a high point of sight nearly level with the church roofs. This is as original as the other tower, though very different in treatment; it is roofed with a low pitched hipped roof rising into a finial, and with very wide projecting eaves carried on massive brackets which are supported by carved figures below. There are deep buttresses at the angles and a semi-octagon stair-turret at one angle, stopped short by a lean-to roof against the tower.

1,918. "Layer Marney Towers, Essex;" Mr. Arnold Mitchell. Part of Mr. Mitchell's collection of measured drawings of Layer Marney, which were published together in the *Builder* for April 3 and 10, 1886.

1,919. "Cloisters, Arles, France;" Mr. C. E. Mallows. A freely-executed pencil sketch, in which a good deal of effect is got without labour. It is a view looking along the interior of one cloister, showing the coupled columns and huge and half barbarously proportioned capitals, and the heavy segmental arches which divide the roof into compartments at each bay.

1,920. "A Corner, St. John's Church, Stanstead Montfitchet;" Mr. W. D. Caröe. A very interesting corner, facing the north pier of the chancel arch, and showing the organ screen in two designs, one towards the chancel the other towards the nave. The organ is treated in towers of pipes in the orthodox way, but ingeniously varied, the centre towards the chancel showing a tower triangular on plan, that towards the nave being treated with a semi-circular tower at each side. The drawing is beautifully executed in pen-line, and the carved details of the organ case especially are shown with the most conscientious care and correctness of drawing.

192. Design for a Free Library for a County Town;" Mr. A. Bartlett. Two small coloured

elevations, stone below and brick above, with large windows divided up by the frames in such a manner as to break them up agreeably; a circular window under the gable in the end elevation shows an original little bit of tracery in a rather flower-like form of design. There are other commendable bits of detail in the design.

1,922. "The Jew's House, Lincoln;" Mr. A. H. Powell; a good bit of colour, but looking somewhat brighter than this ancient house-front actually looks.

1,923. "Study for a Gallery of Sculpture;" Mr. R. Phené Spiers. A very highly-finished elevation and section on rather a small scale, with a miniature plan added. The plan is in the shape of an inverted T, the point of juncture being marked by an octagonal cupola. The front elevation is rather too suggestive of a railway-station, and it is a pity to repeat again that unhappy way of treating a semi-circular window by inserting two upright mullions in it, cutting into the circle of the arch; one of the worst ways of dividing up a semi-circular window. The section shows the materials for a very fine interior, and one well suited to its purpose; there is an order of marble columns with gilt capitals, and over the entablature a small attic occupied by medallion heads in circles with a red ground. The gallery through which the section is taken (the shank of the T) is divided into bays or "chapels" by internal buttresses, and in front of the shadow of each bay, on the section, stands a white marble statue. The roof, an arched vault, is richly treated in blue and gilding, with figures in each bay. The effect of this rich setting for sculpture is very suitable. The section is an admirable piece of work, finished with minute care.

1,024. "Boat-house, Maidenhead Court;" Mr. R. S. Wornum. This is a pleasant little bit of riverside architecture, apparently boathouse and cottage in one, placed at an angle with each other, in an L-shape. The gabled front to the boat-house would have been more really picturesque and more suited to its situation and purpose if it had been a little less "busy."

1,928. "Memorial Fountain, Lowestoft;" Mr. Paul Waterhouse. This is an Ionic column with the old-fashioned slice of entablature on it, and the usual form of pedestal at the base; water issues from the centre of each side of the frieze of the slice of the entablature, and from the centre of each side of the pedestal. We cannot say this is a happy idea; in fact, it is about as absolute a misuse of the columnar form as could be imagined.

1,929. "Christ Church, Waterloo;" Messrs. Birkett & Langham. This is mainly a drawing of the tower, a large tower of the Somersetshire type, standing a little apart from the church, but connected with it by a low porch or passage. The west end of the church, with a large late Gothic window and a rather deeply-recessed wall arcade over it, has a rich and satisfactory appearance. A sketch is added showing the method of finishing the lower stage of the tower for the present, until the remainder can be built; the architects have managed, by putting a high-pitched roof on, to make it a rather less ugly and stumpy-looking thing than a tower to be completed subsequently is generally allowed to remain.

1,930. "Church of St. Michael, Stonebridge, Willesden;" Messrs. Goldie, Child, & Goldie. A very simple Early English church, the east end showing a group of five very narrow lancets, almost as plain as they could be left, and surmounted by a wall-moulding grouping them together; in the gable are three niches with figures in them. There is a broach spire of the good old style, with lucarnes perhaps a little too large and projecting. The drawing is executed in pen-line, in an unpretending but tasteful manner.

1,932. "New House, Palace Court, Kensington;" Mr. W. Flockhart. A large and boldly-treated pen-drawing of a picturesque house, with the class of features which go to make a picturesque house nowadays; a studied avoidance of symmetry, a corbelled-out octagon angle-turret, the whole rather rambling but very effective, and in a good bold manner of detail. The portion on the right, with the flat and railing at the top, looks, however, a little too much like the ordinary Classical variety of house architecture to group quite satisfactorily with the rest.

1,934. "The Font and Canopy, St. Peter Mancroft Church, Norwich: restored;" Mr. F. T. Baggallay. A large pen-drawing which was illustrated in the *Builder* of January 4, 1890; it is an exceedingly solid and careful pen-drawing, finished like an engraving,—perhaps a little too much like. The canopy, as many of our readers will remember, is an exceptionally rich example of a class of work which seems at one time to have been popular in Norfolk churches; the canopy being an octagonal erection with open bays and supports at the angles, standing over the font. The angle-piers in this case are composed of four shafts forming a square with its angle outwards, and richly decorated with canopy work and niches between the shafts; there are only complete piers at four angles, those at the other four being cut short off as pendants, and supported by the middle portion of the construction. There is nothing in the drawing to indicate how much is restoration.

1,935. "Memorial Church, Colston Bassett, Northamptonshire;" Mr. A. W. Brewill. This is a small cross church in pure Gothic style, notable for the employment, on the crossing tower, of a tall and perfectly plain spire, without mouldings, lucarnes, or detail of any kind. This very simplicity has, however, a certain air of originality and is not unpleasing.

1,936. "Brooklands, Weybridge;" Mr. R. T. Blomfield. A large pen-drawing of a square-looking house built of brick, with small angle-quoins, large windows with small square panes, and very plain architectural treatment. At the further end a portion rises into a tower, with a small octagonal cupola set on the meeting of two gables. A lower and very plain building near the front of the drawing, with a broad and massive chimney-stack rising from it, plays its part in the picture, in which there is rather too much the air of an old house revived.

1,937. "St. Andrew's Vicarage Earlsfield;" Mr. E. W. Mountford. This is a picturesque Gothic house, with the look of a parsonage about it. The drawing, a pen-line one in a free style, is a little spoiled by too flashy an effect of contrast between white and shaded spaces.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE ROYAL GOLD MEDAL.—MEDIÆVAL ARCHITECTURE IN SWEDEN.

THE sixteenth and last ordinary meeting of this Institute for the present session took place on Monday evening last, at 9, Conduit-street.

Mr. J. Macvicar Anderson, the new President, on taking the chair for the first time, was received with applause, and, in the course of a few words of acknowledgment, he said:—Most of us are old friends, and I venture to express the hope that anything that may occur during the next year may not in any way interfere with the good fellowship and the confidence that have always subsisted between us. We now come to what it is scarcely fair to call business, for it is really the most agreeable part of the whole year's proceedings,—viz., the presentation of the Royal Gold Medal.

Presentation of the Royal Gold Medal.

The President said:—Colleagues, ladies, and gentlemen,—The Royal Gold Medal, the gift of Her Majesty the Queen, is annually conferred on such distinguished architect or man of science, of any country, as may have designed or executed a building of high merit, or produced a work tending to promote or facilitate the knowledge of architecture or the various branches of science connected therewith. Since the days of the refined and cultured Cockerell, who was the first recipient of the Medal in 1848, it has year by year been bestowed by the Queen, at the recommendation of the Institute, on distinguished architects and men of science, at home and abroad, whose names having often been recalled on occasions similar to the present, I will not refer to further than to say they have, indeed, become as household words in the realm of Art. We are met to-night to add one more honoured name—the forty-fourth — to the historic list of Gold Medallists. That so many years have passed since the foundation of this Royal honour involves the melancholy reflection that the majority of these distinguished men are no longer with us—indeed but eleven survive, of whom nine are Englishmen; but the sadness of this reflection is happily tempered by the recollection that our Royal Patron is still spared, after a prolonged and beneficent reign, to confer these marks of distinction on such members of our profession, at home and in other lands, as in the opinion of their brethren are worthy to receive them. The roll of Gold Medallists embraces the names of men who in their day and generation have attained eminence as architects, or archæologists, or who have produced works of literary merit tending to promote the knowledge of architecture. Of these the former predominate, as, in my judgment, they ought; for who should be so well able to assist in the promotion of architecture as those whose lives are devoted first to the study and afterwards to the practice of the art, and of the varied sciences connected therewith? The literary man no doubt influences,—and, if he be a writer of mark, largely influences,—his contemporaries, as well as posterity, by his works; but no less so does the architect in practice, who not only leaves the impress of his genius engraven on the enduring monuments which he creates, but in addition exercises a power, by virtue of his character and individuality, which necessarily affects, for good or evil, those with whom he comes into personal contact, in the complex relationships of his professional career. The practising architect thus enjoys a privileged position; for, while following his bent and indulging his fancy, he can,—and if his taste be rightly inspired he should,—contribute to the comfort and happiness of society by the fitness and the elegance of his creations, and, further, by integrity, independence, and honourable dealing in his practice, he can raise the tone of his profession, and establish it in the good opinion of men; for his is much more than an ordinary avocation or means of subsistence, it is the pursuit of the beautiful and the useful, and in proportion as he aspires to such attainments, so, and in the same proportion, will he be likely to reach celebrity, and to leave his mark on his age. Such considerations as these lead me to rejoice that the Royal Gold Medal is now to be bestowed on one who is a worthy and distinguished member of the profession, one whose works are deservedly esteemed by competent judges, one whose life and character have tended to promote a high standard of honourable practice,—Sir Arthur Blomfield. To speak publicly of an individual, or of his works, in his presence, is at any time a matter of delicacy,—much that one would like to say must remain unexpressed,—but I must ask my friend and colleague to bear with me while I venture to touch very briefly on one or two points in his career which seem to me to possess general interest, and to refer,—necessarily in the most cursory manner,—to a few only of his more important works. Educated at Rugby, and at Trinity College, Cambridge, where he took his degree as Master of Arts, Mr. Blomfield,—as he then was,—entered the office of Mr. Philip C. Hardwick, where he remained for the period of three years. In 1855 he travelled to Rome, Florence, and other parts of the Continent, in conjunction with the late Frederick P. Cockerell, and those who remember the charm of Cockerell's society, can realise what the pleasure and profit of such travelling companionship as his must have been. Commencing practice in 1856, the career of Mr. Blomfield was, I believe, one of continuous progress and success. In 1867 he was elected a Fellow of this Institute, and has served on the Council, and as a Vice-President. In 1888 he was elected an Associate of the Royal Academy. On the occasion of the consecration of the English Church at Copenhagen he was elected a member of the Royal Academy of Arts of Copenhagen, and presented with the Order of the Danebrog by the King of Denmark. He holds the appointment of Architect to the Bank of England. Last, but not least, he was in 1889 created Sir Arther Blomfield, Knight, by Her most Gracious Majesty the Queen. No mean record, surely, of the honours of a professional career. Of Sir Arthur Blomfield's works those which claim attention first are his churches. I know not whether he himself desires that his fame should rest on his being in any sense a specialist, but without going so far as this, I fancy that I shall not be far wrong when I say, that in the first instance at all events, his reputation was established by the purity of taste and the general excellence displayed in his ecclesiastical work. To enumerate his churches would be to fill many pages, and to occupy much of your time; the number he admits to be "very large"; and although he modestly considers that there are few "worth mentioning," most of us

would probably be of opinion that a visitation to these works would be attended with pleasure and instruction. Of the very few which, in response to my inquiry, he has thought worthy of mention, are the Private Chapel at Tyntesfield, erected for the late Mr. William Gibbs; Privett Church, Hants; and St. Mary's Church, Portsea, commenced, I think, in 1884, and only completed last year. Judging from the illustrations published in the *Builder* in July, 1884, this fine and important church of St. Mary's appears to be a work of real merit, worthy of the reputation of its architect. Of his secular works, I may refer to Denton Manor, Grantham, for Sir William Welby Gregory, a work, I have always understood, of great excellence; Whitgift Hospital Schools, Croydon; King's School, Chester; Bancroft School, Woodford, for the Drapers' Company; Queen's School, and Lower Chapel, at Eton College; the Fleet-street Branch of the Bank of England; and Sion College Library on the Thames Embankment. You are aware that Sir Arthur is now engaged in rebuilding the nave of St. Saviour's, Southwark, and it must be satisfactory to all that a work possessing much archæological and historical interest has been entrusted to such competent hands. Many centuries have passed since the wise man declared "How much better is it to get wisdom than to get gold," and although the undoubted truth of this aphorism may at first sight appear to detract from the value of the Gold Medal which Sir Arthur Blomfield will to-night add to his other well-earned honours, it really enhances it, for this Medal is but the recognition of that wisdom which is the result of years of study and labour, and is manifested in the numberless works which have so surely established his fame as an accomplished architect.*

Turning to the recipient of the Medal, the President said:—Sir Arthur Blomfield, my words to you will be few, believing that nothing I can say will increase the estimation with which you are already regarded, and that in brevity I shall best consult your own feelings. I do not forget that this is not the first occasion on which you have—as your knighthood indicates—been the recipient of Royal favour, nor that to be thus specially selected for honour must at any time be esteemed by a right-minded man as a lofty distinction; but when, as in the present instance, honour is bestowed on the direct recommendation of those who, as experts, are best able to gauge the merit of a professional colleague's life and work, its value is, in my judgment, immeasurably enhanced. I venture to think, therefore, that this Medal will be none the less appreciated by you from the circumstance that it is conferred by the Queen, on the recommendation of your brother architects. Permit me to add that I feel gratified and proud that my first official act as President of the Institute should be the privilege of presenting this gift of her Majesty to one so well worthy to wear and to possess it. On behalf of the Institute, and for myself, let me express the hope that you may long be spared to be an ornament to the profession and to enjoy the honours you have so deservedly won.

Sir Arthur Blomfield, A.R.A., who was received with loud and long-continued applause, said:—Mr. President, ladies, and gentlemen,—Let me first thank you, Sir, very sincerely for the very kind and too flattering terms in which you have spoken of me and of my work. You have been good enough to give expression to a feeling of satisfaction that the first of your official acts, as President, should be to present me with the Gold Medal which Her Majesty the Queen annually gives to an architect or man of science on the recommendation of this Institute. Before I say one word on that subject, Sir, I hope I may be permitted to take this opportunity of expressing in a public manner, not for myself alone, but for the whole Institute,—for I feel sure I may consider myself the spokesman of the Institute for this purpose,—to express to you the great satisfaction that we all feel in seeing you in that position of honour and trust to which you have been elected, I may say by acclamation. Every member of this Institute must be deeply and gratefully sensible of the fact that the duties of the presidential office,—always arduous, and very frequently complicated by questions of great difficulty and delicacy,—have never since the foundation of the Institute been more efficiently discharged than they have been during the last three years by our valued and distinguished friend, Mr. Waterhouse. Worthily to succeed such a President as he has been, is, I am fully aware, no easy matter; but, Sir, from the experience we have already had of the tact, the discretion, the firmness tempered always by courtesy, and the other admirable qualities which you have displayed during a long period of official connexion with this Institute, we feel every confidence that the chief guardianship of the honour, the integrity, and the best interests of this Institute could not possibly have been conveyed to abler or worthier hands. We feel sure that, however difficult the task of succeeding Mr. Waterhouse may be, you are fully equal to it, and for that reason, Sir, we all of us congratulate you as heartily and warmly as we congratulate ourselves on your accession to the dignified and honourable position of President of the Royal Institute of British Architects. With regard to the honour which I have just received at your hands, I am fully conscious that it is one of the greatest which can be awarded to any architect, not only because of its being conferred upon him by his Sovereign, but more particularly because it is given on the recommendation of that which is the most influential body of his brother architects in the kingdom. I feel with you sincerely that it may be safely said that the man who can receive a distinction of the kind without deep feelings of pride and gratification would be, as you have hinted, a very singularly-constituted man.

> "The love of praise, howe'er conceal'd by art,
> Reigns more or less, and glows in every heart."

That is quite as true now as it was, and always had been, when it was written 150 years ago. But, however worthy the recipient of this honour may be at any time, and however conscious of his own merits, I think he would be a still more exceptional person if, on an occasion of this kind, and before such an assembly as I see here to-night, he did not find those sentiments of pride and satisfaction mingled in a large degree with diffidence and embarrassment. He must feel, as I feel very strongly at the present moment, that a mark of recognition such as this, coming from such a large and such a representative body as this Institute, is an honour which can scarcely be said to be adequately and properly acknowledged by a mere bold and formal expression of thanks, however hearty and sincere. He must feel, as I feel, that something more than that must not unreasonably be expected on such an occasion as this, from the man whom this Institute singles out for the reception of one of the highest honours at its disposal. But unfortunately if, with the hearty desire to gratify that not unreasonable expectation, he attempts to go beyond simple thanks, he finds himself in this difficulty,—he finds himself absolutely restricted to one subject, and that not only the most embarrassing and distasteful to himself, but the one of all others which most quickly wearies an audience, however sympathetic and indulgent. I have just now quoted a satirist of the last century. One who is known among us as one of the most genial satirists of the present day, in enumerating the various good and attractive qualities of our dumb friends, the domestic pets of everyday life, puts in a very prominent place the fact that they never talk about themselves. No doubt our dumb friends, in that particular, give us a very admirable example. I only wish, gentlemen, that it was more often followed,—in fact, I heartily wish I could follow it on this occasion. But, in a chequered career, circumstances will sometimes arise when, however desirable reticence may be, it is no longer possible, and when, however reluctant he may be, a speaker must necessarily, instead of giving his audience some palatable intellectual effort in the shape of instruction or amusement, offer them what I may term a dose of egotism. I am afraid that this is such an occasion, and that it becomes at once my privilege and my pain to ask you to bear with me, and to listen for a very short time while I say a few words about myself. I can at least promise you, ladies and gentlemen, that my dose of egotism shall be homœopathic in quantity. As for quality, if I might push that line of thought a little further, you know we sometimes beguile the fancy of childhood by administering an unavoidable but suspicious globule in some vehicle of somewhat less doubtful aspect, and more agreeable flavour. In the same way I propose now to introduce the very few words I have to say about myself with an anecdote of one of the most distinguished of my predecessors, whose name has been already mentioned as the first recipient of the Gold Medal in 1848. Perhaps under the shelter of this illustration I may secure from you a measure of indulgence which otherwise I could hardly venture to hope for. When I was a young architectural student,—and I lay stress upon the word "*young*," because since then I have nearly trebled my age, and although I have carried out a considerable number of works of various descriptions of importance, and although I have now received what I am proud to consider the crowning honour of my career, I am still a student; I do not hesitate to confess that, and to say that I shall continue to be a student so long as I can use a pencil and read a book; for I hold very strongly that the education of an architect is never completed, and when he feels it to be completed, if he ever does so, it is time he should be laid on the shelf. Well, when I was a young architectural student, coming one day, which I shall never forget, up Ludgate-hill, I met Professor Cockerell coming down. He stopped and greeted me in his kind and cordial manner, and, laying his hand on my arm, he turned round and pointed to the dome of St. Paul's, and he said, "Blomfield, when I look at that magnificent conception, and buildings such as that, I say to myself, 'the men who could do work like that were giants, and what are we? Pigmies.'" He said no more, but walked on; but these words, coming from so learned and so distinguished a man, and so great an artist, struck me as so remarkable that I have never forgotten them. They have often recurred to my mind in after years in the general sense in which they were spoken, and also narrowed down to personal application to myself; but they never impressed themselves on my mind so vividly as when I received the intimation of the honour intended me by this Institute. When I read the letter conveying that intimation I can assure you that the feelings I experienced can only be properly conveyed by something very like the words spoken to me many years ago by Professor Cockerell. I literally felt like a pigmy amongst giants. When I look back at the roll of the former Gold Medallists, and the many distinguished and illustrious names contained therein, I can feel nothing else. Perhaps on an occasion like this, and before so indulgent an audience as I have, I think I might be excused if I were to fall back on the apologetic platitude of saying that, however little I have been able to do, at least I have done my best; but certainly no man can be said to have done his best while he has health and strength, and a hearty desire and ambition to do better. Gentlemen, I can at least claim that hearty desire and ambition, and that encourages me to hope that whatever work I may be prepared to carry out in the future, I shall never do anything which may bring discredit on the choice which you have done me the honour of making this year, in choosing me as your Royal Gold Medallist. For that honour, gentlemen, I return you my most hearty and sincere thanks.

Sir Arthur Blomfield resumed his seat amidst loud applause.

Mediæval Architecture in Sweden.

Mr. J. Tavenor Perry then read a paper on this subject. In his introductory remarks he pleaded that no serious attempt had been made

* As a supplement to the *Builder* this week we give a portrait of Sir Arthur Blomfield, and we may here append a list of those of his works and designs which have been illustrated in our pages during the past twenty years, viz.:—Whitgift Hospital School, Croydon, see *Builder* for August 19, 1871; St. Saviour's Church, Oxford-street, London: for the Deaf and Dumb, September 16, 1871; St. John's Church, Bath (Interior View), January 6, 1872: Church, Oundle, April 27, 1872; Sion College: New Buildings then proposed on the Thames Embankment, May 1, 1880; Selwyn College, Cambridge, June 11, 1881; Cathedral, George Town, Demerara, November 5, 1881; St. Katharine's Training College, Tottenham, August 6, 1881; Chapel Royal, Brighton, as altered, October 25, 1882; Church of the Holy Trinity, and Lectern, Privett, Hants, November 25, 1882; The Bagge Memorial, Swaffham, June 2, 1883; Chancel Screen, St. John's Church, St. Leonard's-on-Sea, October 27, 1883; St. Mary's Church, Portsea, July 5, 1884, and July 19, 1884; Design for proposed restoration of South Transept Front of Chester Cathedral, May 16, 1885; English Church, Copenhagen, October 3, 1885; Church of SS. Peter and Paul, Fareham, Hants, July 10, 1886; Monument to the late G. E. Street, in the Law Courts, July 3, 1886; Church, Warminster, as restored, February 12, 1887; Law Courts Branch of the Bank of England, Fleet-street, May 21, 1887; Design for Imperial Institute, July 23 and 30, 1887; Window, South Transept, Chester Cathedral, September 24, 1887; Church of St. George, Cannes, November 26, 1887; details of main front of Sion College, Thames Embankment, May 5, 1888; Porch of St. Mary's Church, Portsea, June 2, 1888; the Entrance Porch, Sion College, September 22, 1888; and Design for Restoration of Nave of St. Saviour's Church, Southwark, May 10, 1890.

in England to deal with the subject, and his object was to give such information as he had obtained during his visits to the country and as he had gleaned from others. The physical features of Sweden he considered altogether unfavourable to the development of an architectural style; but its unfavourable circumstances had their effect in so modifying the arrangements of the buildings as to result in such important local peculiarities as almost to amount to style. The earlier buildings were entirely constructed of granite and timber—the materials most abundant and nearest to hand. The unworkable character of the granite and its cost of transportation led to the substitution of brick; with the result that in all ornamental features the same peculiarities of treatment and detail appeared as in those of the great churches of Pomerania and Mecklenburg. At the end of the eleventh century attempts had been made to organise the Christian Church in Sweden, and the earlier missionaries and bishops had been Englishmen. English influence might, the author thought, be traced in much of the work of the twelfth and thirteenth centuries.

The cathedral church of Lund was the oldest and most important church in Sweden. The plan of the building consisted of a nave and aisles, western towers, aisleless transepts, an apsidal choir, and a large lofty crypt extending under the whole of the choir and transepts. Whether the nave had been intended to be vaulted was doubtful; but several attempts to do so had been made. The whole building was carried out in hard stone, and there still existed a considerable amount of good carving untouched by the restorer. The two most noticeable features of the exterior were the elegant apse with the open gallery round the eaves, and the richly-carved north porch of altogether Italian treatment. The existing remains of the conventual church of Dalby, like in many ways to the cathedral of Lund, consisted of a large nave, a western tower, and a south porch. The most remarkable feature was the crypt, which was a large chamber vaulted in three aisles; and its position showed that it was constructed as a baptistery. Upsala Cathedral was a building of great historical importance to Sweden and of particular interest to the archæologist. The building which first became the cathedral, and which still existed, was a square hall of rough granite having two lofty and wide arches on each face; it had been altered several times and now formed the nave of the ancient church. In 1287 the archbishop entered into an agreement with Estienne de Bonnueill to build a cathedral at Upsala upon the plan of Notre Dame. There was much to support the theory that Frenchmen had been at work upon the building; but the eastern termination bore no resemblance to Paris, and its plan was much more German than French. The carving and arrangement of the capitals of the great piers and corbels round the choir were also much earlier in character than such as would have been designed by a French architect of that period. The author thought that Estienne exercised but little influence on the design of Upsala, which, he considered, must have been the work of native artists. Still he believed Estienne might have done much to improve the design, and even to found a new school of sculptors, who freed themselves from the toils of the runes and snakes until that time so prevalent.

At Skara was one of the oldest cathedrals in Sweden. Little, however, remained of its earlier work, except in the western towers. It was built of stone, with western towers, nave, aisles and transept, and apsidal choir, with turrets at the angles of the choir and transepts. The work generally might be assumed to belong to the last part of the thirteenth century, but there was little carving or mouldings by which to fix a date. Linköping ranked second to Upsala in dimension, but surpassed it in the beauty of its details. It had grown up piecemeal, like an English cathedral, and all the work was the best of the several periods. Apart from modern additions the building appeared to belong to four distinct periods, the work of the oldest being the transepts and crossing of the choir, probably erected about 1150; and at a date early in the next century the present nave must have been begun. The progress of the work during the thirteenth century did not appear to have been stopped, but must have spread over a long period, as at the west end of the nave the work was as late as (or later than) any at Upsala. The smallness of the existing choir, and other peculiarities perceptible at the east end, made it probable that at one time there was an apse as an eastern termination; and, at all events, about the beginning of the fourteenth century a new choir, with chapels, had been begun. Much in the character of the mouldings and work generally suggested that Estienne of Paris and Upsala had had some control; but he could have had nothing to do with the plan, which was totally unlike a French plan. The ornamentation and sculpture were particularly rich, the richest portion being the great south portal. The most important brick-built Swedish cathedral was that of Abo, in Finland, of which, as well as of the older church of Räntämäki, the author had given an account in the *R.I.B.A. Journal* [see page 4 *ante*]. The cathedral of Vesterås was said to have been founded about 1100, but no remains so ancient now existed. It was a five-aisled building, ending in a polygonal-shaped apse, which did not properly fit on to the rest of the building. The small cathedral of Vexio, a three-aisled church of a uniform height, was more interesting. It had a projecting chancel, one bay ending in a square east end, and a large tower on the west front. Other important churches, especially those of Malmö and Ystad, were described by the author, who was of opinion that, notwithstanding the number of circular churches, the majority of the earlier ones had square eastern terminations, notably Räntämäki and Karins, near Abo, and, of later style, Örebo and Vexio; where, however, German influence became predominant, an apsidal termination had been adopted. The omission or reduction to the smallest dimensions of the clearstory was also a noticeable peculiarity; one reason for which, apart from German influence, was, he thought, the desire to simplify the roof as far as might be. In the earlier churches the porches were of great extent, and during the best periods of architecture the portals were considerable, and treated with a great deal of ornamentation. All the churches were provided with bells, but towers to the smaller ones were uncommon, the belfries being generally detached wooden erections. Elaborate stalls still remained in Lund Cathedral, and small portions at Vesterås, Dalby, &c., while several fine Late German tryptichs were to be found about the country. Of fonts there was a vast quantity, mostly of an early date and of elaborate design.

Restorations had been going on for years, and were still proceeding with vigour at Upsala, Skara, and Malmö. That at Linköping was confined to building a new west front of the poorest description; but at Skara, from a comparison of some old drawings with the work already completed, it seemed to be conscientiously carried out. At Upsala work was going on against which it was, however, too late to protest. The external work had been formed in concrete, enriched cornices, gargoyles, pinnacles, and open parapets being all cast to pattern in cement. To concrete as an ornamental building material, legitimately used, there could, however, be no objection, as, for example, on a recently-erected church at Stockholm, in which all the work, except the carving, was in concrete, and the effect he considered very good.

The Rev. F. H. Woods, at the close of the paper, said that he had taken considerable interest in Swedish architecture, and chiefly in connexion with Gothland. The wonderful ruins of Wisby were well worth a visit. The old walls still circled a town there, which had now sunk to the size of a village. Every village church, too, in Gothland was interesting, and one might visit at least a dozen in a day. With regard to the church fonts in Sweden, it was most distressing to find them stacked in the museum at Stockholm, having, in many instances, been sold by the parishioners. The restorations going on were also very distressing. On one occasion he had determined to spend some time in Vexio, inspecting the cathedral, but when he got there he saw a building of plaster and red-brick, which looked as though it had been erected the other day. The remains of the timber churches had not been mentioned, but they all knew the famous timber churches in Norway, and there were also some very interesting ones in Sweden. One particularly interesting church, at a place called Roda, was outwardly an extremely uninteresting building, with hardly any architectural features, while internally it was very beautiful. The ceiling was in the form of a trefoil pattern, decorated with finely-painted work, being, in fact, one of the best specimens of fresco painting in Sweden. He had been also much struck by the appearance of the bell-turrets. These were in great variety, and some of them must be ancient, because he had seen one close to an old monastic ruin. With regard to books, he had in his hand a volume by Hildebrand, which gave an interesting history of Swedish architecture.

Mr. R. Herbert Carpenter said that having seen some of the buildings, so well described in the paper, he had much pleasure in proposing a vote of thanks to Mr. Tavenor Perry. He had experienced the difficulty referred to, of obtaining a really valuable guide-book, but he had been able to see Lund, Malmö, and Upsala. With regard to the latter cathedral his theory was a little different to that of Mr. Perry. It seemed to him that when the bishops moved their seat to the new Upsala, and left the old temple at old Upsala, there was a church on the rising ground, the Mons Domini, as it was called, where the cathedral stood, and there must have been a church standing there which probably occupied the site of the nave of the present building. Then he thought that the French architects had a great deal to do with the laying-out, and that they laid out the whole of the choir, chapels, and transepts, the chapels of the nave and the western towers enclosing the old nave and chancel. Then, he believed, they to a certain extent built the western part, making the choir higher, and building the western piers higher than any other part of the nave. The work, he considered, then stopped for a time, and the architect who resumed it took down the older church in the interior, and built up very much plainer piers. Then when he came to the upper part of the transept and choir, it was no doubt taken up either by the Swedish or German men, as there was a great likeness in the tracery to that at Lubeck. The piers, with their bases in the French style, were continued up in the moulds running round the arches. That seemed to show that the church stood for some time, and was continued by the Swedes. They had not begun the restoration at Upsala when he was there, but restoration was in progress at Lund, where he was shocked to see the contrast between the work going on, as compared with the restorations at Trondhjem Cathedral in Norway. The Norwegians were to be congratulated on the restorations at Trondhjem, as they were being carried out with the greatest care and fidelity.

Mr. William White, F.S.A., seconded the vote of thanks, and thought that Mr. Perry had scarcely done justice to the grand outlines of Malmö cathedral. Although simple in conception, the effect of the recessed mouldings in brick receding one after another, was very fine. He believed that all the Swedish churches were originally intended to be vaulted.

The President said it had been mentioned that one of the characteristics of Sweden was the number of its country churches. If the Swedish country churches had anything like the interest which attached to those of this country, Sweden must be well worth visiting.

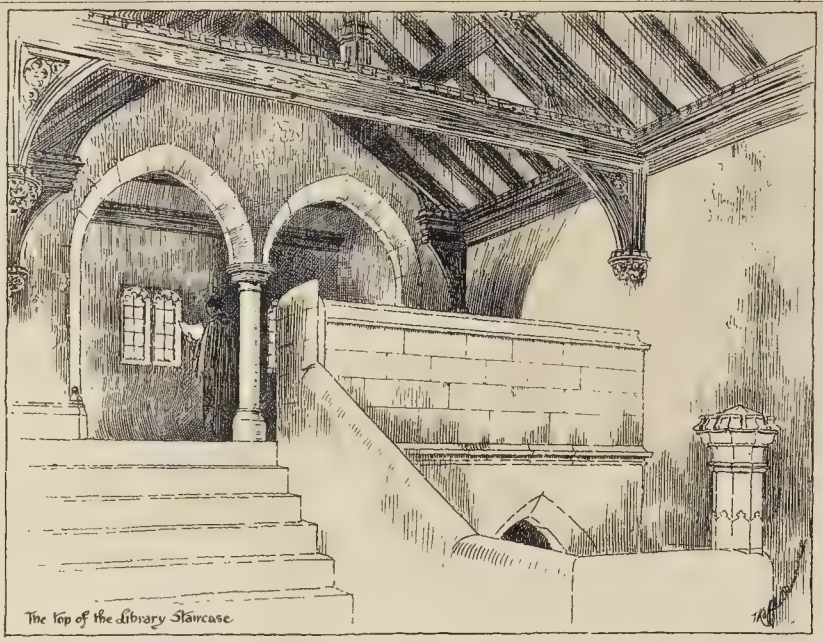
The vote of thanks was then put to the meeting, and carried by acclamation.

Mr. Tavenor Perry, in replying, said that Mr. Carpenter's theory in regard to Upsala would take too much time to answer at that meeting, but he proposed to deal with it in a note appended to his paper.

The President announced that the adjourned meeting, to continue the discussion on the new educational scheme and curriculum of the Architectural Association, would be held on Monday, the 6th proximo.

The proceedings then terminated.

PROPOSED NEW SHIPYARD FOR THE TEES.—The project for establishing a new shipbuilding-yard on the Tees, started some time ago by a syndicate of gentlemen belonging to the Hartlepools, Whitby, and Middlesbrough, is, it is stated, now practically matured, and the laying out of the works is to be proceeded with with as little delay as possible. The promotors have secured fifteen acres of land, with powers to extend, at the bend of the river near to the Haverton Hill Salt Works, and in close proximity to the site upon which natural gas was recently discovered. The designs, which have been prepared by Mr. Sandiman, C.E., of Newcastle-on-Tyne, include two dry docks, capable of receiving vessels of the largest tonnage, and berths for the construction of six of the largest type of steamers. The capital of the company is 100,000*l.*



The top of the Library Staircase



The Library

Mansfield College Oxford

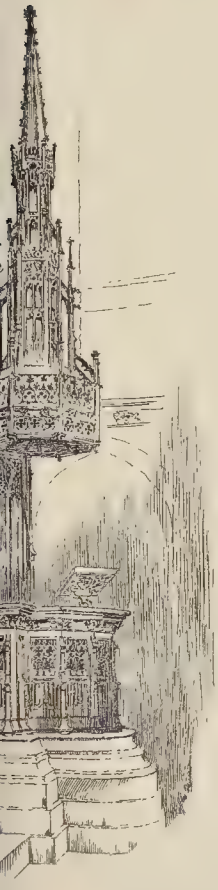
Basil Champneys B.A. Architect

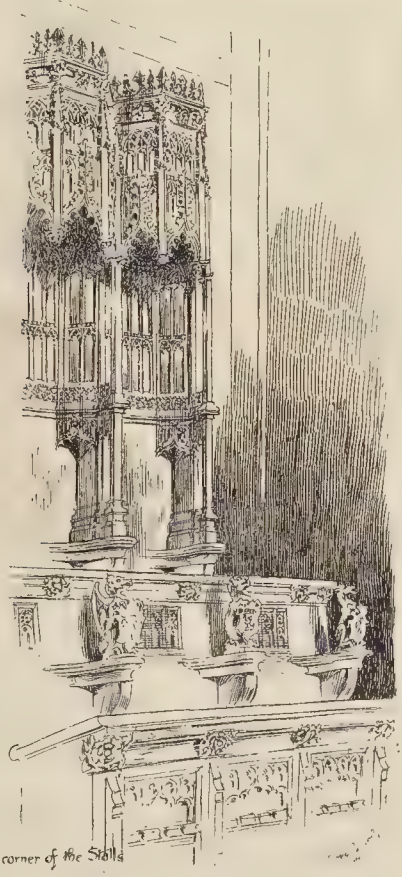
Sketches from The Interior as completed March 1891

The Pulpit



The Dining Hall





A corner of the Stalls

PHOTO LITHO SPRAGUE & Co 4 & 5 EASTMAN BUILDING STREET FETTER LANE E C

CONGRESS OF FRENCH ARCHITECTS.*

THE sitting of Tuesday June 16 was opened half-past two, M. Journoud, of Lyons, Presi-nt of the Association Provinciale des Archi-ctes, taking the chair in the absence of M. rnier, who was detained at the Conseil des ttiments Civils. M. Lucas made a communi-tion, partly report and partly a lecture, on e nineteenth Congress of the "Association ançaise pour l'Avancement des Sciences," ld at Limoges in 1890. He spoke first of the ssociation, its origin its annual meetings, fusion with the "Association Scientifique France," its present organisation and sources; secondly of the proceedings of the moges Congress of 1890; thirdly of its visits the École Nationale d'Art Décoratif, the rcelain manufactures of MM. Haviland & Co. Guerin and M. Pouyat, and to the State eliers of construction and manufactures, &c.; d of the excursions to the Château of Bort, d various other places, including Brive, Les yries, Périgueux, Brantôme, Angoulême, &c.; the religious monuments of Limoges, the athedral and its restoration under M. Bailly, d the churches of St. Michel-des-Lions and aint Pierre du Queroy; concluding with some bservations on the Société Régional of the rchitects of Limousin and Angoumois, its ifficulties of organisation and its present osition. The President, after thanking M. ucas for his address, spoke of the necessity of he Congress of Architects visiting by turns he seats of the various provincial societies. I. Bailly gave some explanation of the draw-ngs and photographs of the work for en-arging and completing the Cathedral of imoges; and the meeting then adjourned to he anatomical lecture-hall where were rranged the materials for the lantern exhi-ition of the sketches prepared by M. Ch. Normand in Metapontis and the Morea, to llustrate his lecture on the results of explora-ions made by the Germans, the English, the rench, and the Greeks at Corfu, Patras, lympia, Corinth, Mycenæ, Tiryns, Nauplia, legalopolis, and various other places, finishing y showing a view and description of the Acropolis at Athens as now existing. The neeting separated at five, with cordial thanks o M. Normand.

The third sitting of the Congress commenced at 9.45 on Thursday, June 18, at the Hemicycle des Beaux-Arts, M. Coquet, of Lyons, presiding. The proceedings commenced with a paper from M. Delaire on "L'Enseignement de l'Administration et de la Comptabilité des Architectes." M. Delaire commented on the present state of things, and on the important position now held by "Métreurs-Vérificateurs," and the importance of the "Séries de Prix," and on the awkward position created for the inexperienced architect by exceeding the estimates, and the responsibility under which he might lie for mistakes in this portion of his professional work, in the provinces even more than in Paris. At the present moment, he said, an architect of twenty-five years of age, who had passed his seven years' course in the École des Beaux-Arts and gained the grand prix and a diploma, if he were appointed official architect in a town of the second order, would have no experience or know-ledge to enable him to calculate the cost of a small house or to go through the accounts for the work; he would have been absorbed in the numerous studies of another kind which the course of the École compelled him to enter into, and would have received during that course no kind of instruction in the conduct of business. In 1863, indeed, in-struction in account-keeping had been nominally made a part of the course of construction of the École, but this regulation had remained a mere dead-letter, although such instruction was of use to all architects, those of the provinces and of Paris alike.

It had been objected that the course of the École was already too full; that the architect who went into accounts would be less an artist, and that account-keeping could not be taught there except in a merely theoretic manner.

It was the profession, in fact, that was too full; yet, in former times such men as Du Cerceau, Bullant, Blondel, and Rondelet, had been not only good artists, but good construc-tors and good account-keepers. Education ought to be an assistance and not a hindrance to an architect, to whom the "vérificateur" was often a very doubtful ally. Certainly practical experience was needed in accounts, as well as in construction; but let there be a theoretic course of teaching, at all events, which should include a knowledge of schedules of prices, estimates, verification, and all other matters connected with the business part of building.

The Chairman, in thanking M. Delaire for his paper, observed that in the provinces archi-tects, not being divided up into classes of specialists, had to attend to all these matters themselves; and that he himself, in designing a great sanatorium for the Canary Isles, had gone into the whole business of specification, estimates, and accounts with his own hand.

M. Gaston Hénard, after testifying to the im-portance of the subject, which the Société had referred to a special Committee whose report would no doubt be of interest, said that he believed the teaching of accounts as part of professional education was quite possible, at least in general principle; and proposed that the Congress, having heard the opinions of architects of the Departments, was of opinion that professorships in the "Comptabilité d'Architecture" should be established both in Paris and in the provinces.

M. Roussi supported this view, reminding them what mistakes had been made by archi-tects eminent as artists but very bad men of business. He added that if the provinces did not see the utility of the measure, Paris demanded it.

M. Martian, of Lille, said that in that town instruction was given in accounts as well as in architectural construction and design; and M. Journoud, of Lyons, said that he saw no inconvenience in the creation of a professorship of "comptabilité" in which theoretic instruc-rion was given, as there could always be practice carried on along with it.

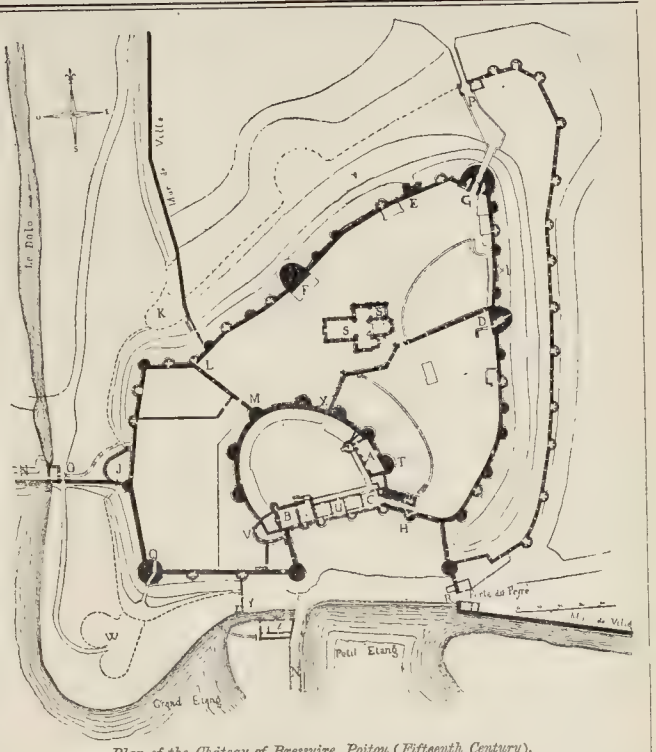
The Chairman put the following resolution on the part of M. Hénard:—

"This Congress is of opinion that instruction in the administration and accounts of buildings should be introduced into the official programme of architectural studies, first in the École Nationale des Beaux-Arts, and subsequently in the local schools of architecture which might be hereafter established."

Resolution carried unanimously.

The Chairman called on M. Barbaud for his paper on the Château of Bressuire. A plan and bird's-eye view of the château were given to the audience, which enabled them to follow the lecture with the more interest. (The plan is reproduced here.) M. Barbaud traced the history of the château through all its periods, through its succession of occupants and succes-sion of wars in which it played a part, tracing its foundation, growth and transformation, from the eleventh to the sixteenth centuries, and down to our own time. The lecture was much applauded.

M. Chas. Lucas then read a paper on the pre-servation of art treasures in their original locali-ties, defining the class of subjects treated of, the sense in which "lieux d'origine" was to be considered, and speaking of the means to be employed to practically carry out his sugges-tions. Among the kind of objects to be con-sidered were such as the bone engravings found in the pre-historic caverns of Périgord; the enamelled glass exhibited recently at the Champ de Mars; the boundary stones on the ancient



Plan of the Château of Bressuire, Poitou (Fifteenth Century).

References to Plan.

A Bâtiment d'habitation (XIIIe siècle).
B Donjon (XIe siècle).
C Porte d'entrée de la cour du Donjon (XIe siècle).
D Porte d'entrée au XIe siècle, puis Tour de la Fontaine, à la fin du XIIe.
E Ancienne poterne du XIIe siècle.
F Grosse tour (fin du XIIe siècle).
G Porte d'entrée (fin du XIIe siècle).
H Petite tour avec poterne de la fin du XIIe siècle, surélevée au XVe.
I Tour détruite au XIVe siècle pour placer l'artillerie.
J Cavalier de terre revêtu de maçonnerie.
K Cavalier de terre garni de palissades.
L M D X Murs de défense divisant la basse Cour.
N Chaussée du grand Étang.
N' Chaussée du petit Étang.
O Fortin défendant la Chaussée et renfermant les Felles.
P Porte d'entrée de la 3me Enceinte.
Q Tour du Corbin (fin du XIIe siècle, modifiée au XIVe).
R Porte du Peyré.
S Église Saint-Nicolas-du-Château (commencement et fin du XIIe siècle).
T Tour du XIIe siècle, surélevée au XVe, et dite alors: du Trésor.
U Bâtiments du XVe siècle.
V Chemise du Donjon.
W Défense en terre, garnie de palissades.
Y Mur crénelé coupant le coteau.
Z Moulin du Peyré.

* Continued from page 487, *ante*.

Armorican lands; the ancient milestones of the Roman roads; the ancient ornamental works preserved in the treasuries of cathedrals, whether of stone, wood, metal, or glass; as well as more recent work which represented the artistic character of a certain locality, or had local connexions with the locality, and a degree of historic value. M. Lucas concluded by moving the following resolution:—

"That the prescriptions and the law of March 30, 1887 on Monuments Historiques should be, as in some other countries, extended so as to include objects of art in general, and that art treasures should as far as possible be preserved in the localities to which they originally belonged."

The resolution was adopted with applause, the Chairman remarking on the prominent part which the reader of the paper had taken for many years in assisting in the success of the annual congresses; and the morning sitting was closed at half-past eleven.

The morning of Friday the 19th was reserved for the general annual meeting of the "Caisse de Défense Mutuelle des Architectes;" the meeting was held in the Hall of the Council of the Société Centrale at a quarter past nine. In the absence of M. Garnier, the chair was occupied by M. Achille Hermant, Vice-President.

The report of M. Lucas, the secretary of the Société, after referring to the loss they had recently sustained by the death of M. Feydeau, gave the following particulars: The Association now numbers 221 titular members, 133 in Paris and 88 in the departments, besides sixteen adherent societies; in all 237 members. The amount in hand was 5,600 francs. The Managing Committee in 1890-91 expended 2,500 francs in the assistance of architects engaged in lawsuits, one before the Court of Appeal, the other before the Conseil d'État, which brought to 8,200 francs the sum spent by the management during the last six years in assisting members engaged in legal proceedings. Three actions brought with the concurrence of the Association in the past year had been successful.

The Committee of Administration had appointed M. Duvert Vice-president, in place of M. Feydeau; the other members of committee retained office, and M. Daumet was appointed delegate to represent the Association at the Syndicate for the Protection of Literary and Artistic Property. The meeting terminated at a quarter to eleven.

Saturday the 20th, the concluding day of the Congress, was a very well filled day. The opening meeting, at nine in the morning, at the rooms of the Société Centrale, was occupied by the sitting of Special Committees, the most important being that on architects' charges, at which M. Roux, Joint Secretary of the S.C., M. Naveau (of Paris) and M. Gonault (of Rouen) were occupied in drawing up a resolution to present to the Congress. The sitting was transferred at a quarter past ten to the Hemicycle des Beaux-Arts, where M. Bissuel, of Lyons, presided. The order of the day opened with the reading of reports of the proceedings of learned Societies. M. Lucas read his report on the two sections of History and Economic Science at the Congress of the Sorbonne. In the first he noticed the researches relative to ancient corporations, and announced the intended appearance of a memoir on the travels of Blondel, the architect of the Port Saint Denis. He also noticed the reports and discussions relating to the Institutions for promoting arbitration and conciliation between employers and workmen, to the question of the legitimate interference of the state in matters of public health, and to the part played by professional schools in primary education.

M. Daumet, who had undertaken to treat of questions brought before the Section of Archæology of the Congress of Learned Societies, drew attention to the interesting subject of the numerous memoirs existing in regard to the architects of the Cathedrals of Rheims, Jubé, Bourges, and one or two other cathedrals, as well as some of the châteaux of France, subjects which, he said, appertained as much to the fine arts as to archæology, and seemed to him to call for a fusion of the archæological section of the "Congrès des Sociétés Savantes" with the meetings of the Fine Art Societies of the Departments; and the resolution to this effect put by M. Daumet was unanimously adopted.

M. Hardy had an interesting subject in the report of the proceedings of Fine Art Societies, from whose documents he gleaned some information of much value and interest in regard to the history of French Art.

M. Roux then read a letter communicated by M. Sibollot, "Chef du Cabinet" of the Minister of Public Works, to M. Garnier; a letter emanating from an engineer-in-Chief of Ponts et Chaussées, suggesting, in reference to the recent circular of M. Yves Guyot as to the conservation of ancient monuments, some measures which might be taken with this object: (1) Indemnity for objects found and preserved, in proportion to their archæological value; (2) designation of museums in each district where objects found might be received; (3) classification, by the departmental committees of "Bâtiments Civils," of objects found, according to their character. On the proposal of M. Lucas these suggestions thus formulated were approved, and the view of the Congress was to be formally communicated to the Government.

M. Leclère, of Rheims, put it to a vote of the Congress, that the departmental Committees of Bâtiments Civils ought to include a greater number of architects, who should be frequently re-elected and nominated on the proposition of the Architectural Societies of the neighbourhood, and who should receive some indemnity for their time and services. The resolution was adopted. Another resolution put by M. Lucas and also adopted, was to the effect that it should be a duty of the Société Centrale and of the Committee caisse de Defense Mutuelle to follow carefully the approaching discussion in Parliament of proposed legislation in regard to artistic property. Lastly two resolutions were adopted in the name of the Committees of Instruction and of architects' charges. The first, proposed by M. Billa, of Nice:—

"That the Congress of next year should study the question of the diploma for architects."

The second was proposed by M. Roux, secretary of the Société Centrale:—

"That the Société Centrale should, as soon as possible, submit to all the French architectural societies the result of its studies on the question of architects' charges."

After a short summary of the work of the Congress presented by M. Roux, the meeting broke up at a quarter before twelve.

On the same day at one, in the Hémicycle des Beaux-Arts, took place the distribution of the "Recompenses" decreed by the Société Centrale for the year 1890-91. M. Larroumet, Directeur des Beaux-Arts, presided at this meeting, at which there was a full attendance of members, as well as a good many well-known members of the artistic world of Paris. After eloquent speeches from M. Garnier and M. Larroumet, and a paper from M. Paul Sedille in the name of the jury charged to award the recompenses, the great point of the ceremony was reached in the award of the medal of Jurisprudence to the venerable President of the Société Centrale, M. Bailly. The presentation of this medal, which may be said to rank with the award of the military medal to a Maréchal of France, was received with great enthusiasm.

A conscientious report by M. Loviot gave a statement of the claims of each of the Medallists to the honour bestowed on him.

In the evening there was the usual banquet at the Hôtel Continental, to which 140 persons sat down. Among the toasts proposed was the health of the President of the Republic, proposed by M. Garnier and responded to by M. Larroumet; and that of the "Union Confraternelle" proposed by M. Joly.

Some very interesting visits were made to various places of note, of which we shall add a short account next week.

NEW PULPIT, NORWICH CATHEDRAL.—A new pulpit, the gift of the Very Rev. Edward Meyrick Goulburn, D.D., formerly Dean of Norwich, was dedicated at a special service held on Wednesday morning in the nave of Norwich Cathedral. The pulpit, which is hexagonal in its plan, is in the style of the early type of Perpendicular, and is elaborately sculptured. The whole of the pulpit has been executed in Caen stone by Mr. Forsyth. The design and all its details are by Messrs. R. Herbert Carpenter and Benjamin Ingelow, architects, London.

THE BATTERSEA POLYTECHNIC.—We are informed that the Prince and Princess of Wales have fixed Monday, July 20, as the date for laying the foundation-stone of the Battersea Polytechnic, of which Mr. E. W. Mountford is the architect. We gave a perspective view and ground-plan of the building in our issue for March 28 last.

Illustrations.

PORTRAIT OF SIR ARTHUR BLOMFIELD, A.R.A.

WE give as a supplement this week a portrait of this year's Royal Gold Medallist for Architecture, Sir Arthur Blomfield. In our report this week of the proceedings of the Royal Institute of British Architects will be found a list of a few of his works. Incomplete as the list is, however, it in itself, to those who know the principal works enumerated, affords ample justification of the nomination of Sir Arthur Blomfield as this year's Gold Medallist, and we congratulate Sir Arthur on his well-merited honour.

FRENCH PROTESTANT (HUGUENOT) CHURCH OF LONDON.

THESE buildings are being erected on a site at the north-west corner of Soho-square, in the place of those in St. Martin's-le-Grand recently pulled down to make way for the General Post-office extensions.

They consist on the ground-floor of a church to hold 400 persons with a principal entrance from Soho-square, and a room to hold the valuable Huguenot library belonging to the Church. At the rear of the Church are two vestries, and a mission-room in the basement. The frontage towards the Square, shown in the view, is occupied above the ground-floor by the pastor's-house, the kitchen, and servants' offices being in the roof.

Owing to the nature of the site, hemmed in by houses, the church is nowhere displayed externally, and is lighted by a clearstory and top-lights in the groining of the aisles.

The exterior is faced with blue Luton bricks and red terra-cotta dressings; and the interior with buff terra-cotta throughout.

The contractors are Messrs. Higgs & Hill, the terra-cotta being supplied by Messrs. Doulton; while the heating is in the hands of Mr. W. W. Phipson.

The drawing from which this illustration is taken is now exhibited at the Royal Academy; this remark applies to all the other buildings illustrated by us this week.

NEW NAVE TO ST. EDMUND'S, BUNGAY.

THE view shows south and west sides of the new nave built to replace the old Catholic church at Bungay,—to which the chancel (shown in view) was added 1888-9.

A view of the interior of chancel was published in the *Builder* for July 27, 1889.

It was a condition given that the organ-loft should be placed over the porch, without any window at the back, necessitating the rather unusual arrangement of a windowless west front.

The three upper niches over the doorway will be filled with sculptured groups representing scenes in the life of St. Edmund, K.M.

The niches at side of doorway are filled with statues of St. Gregory and St. Augustine, and the six-foil panel in gable above is filled with a seated figure of St. Edmund.

All the windows are filled with stained glass by Messrs. Lavers & Westlake.

The statues, stations, carving, and reredos to Lady altar have been executed by Messrs. D. Boulton, of Cheltenham.

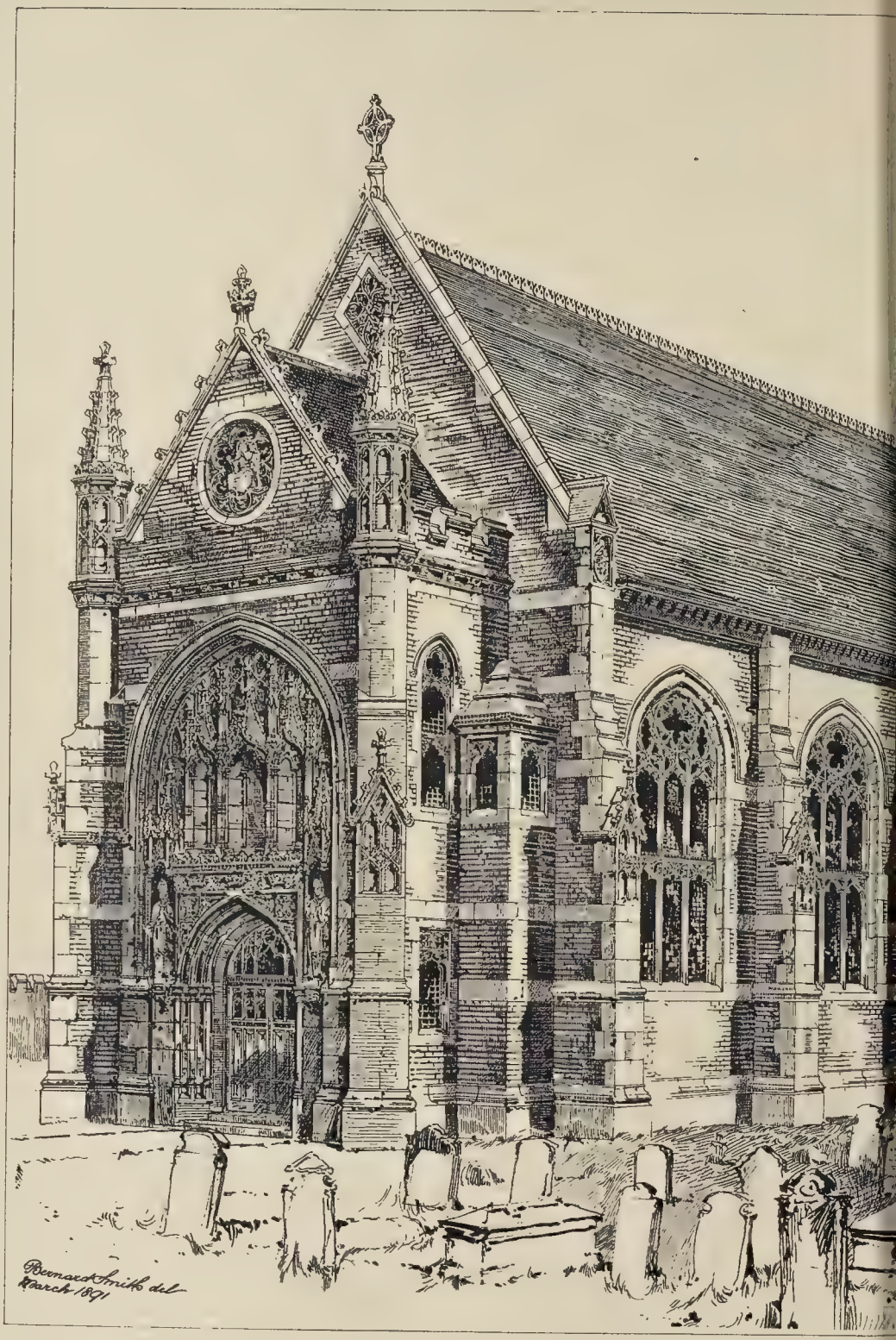
The traceried and panelled oak wainscotting, 7 ft. high, extending round the church, is being carried out by Messrs. Daymond, of Vauxhall.

The rest of the work has been carried out by local men,—by Messrs. Read for the general builder's work; Mr. Foulger and Mr. Rowe for the woodwork; and Mr. Allen, of Beccles, for the mason's work.

The architect is Mr. Bernard Smith, of London.

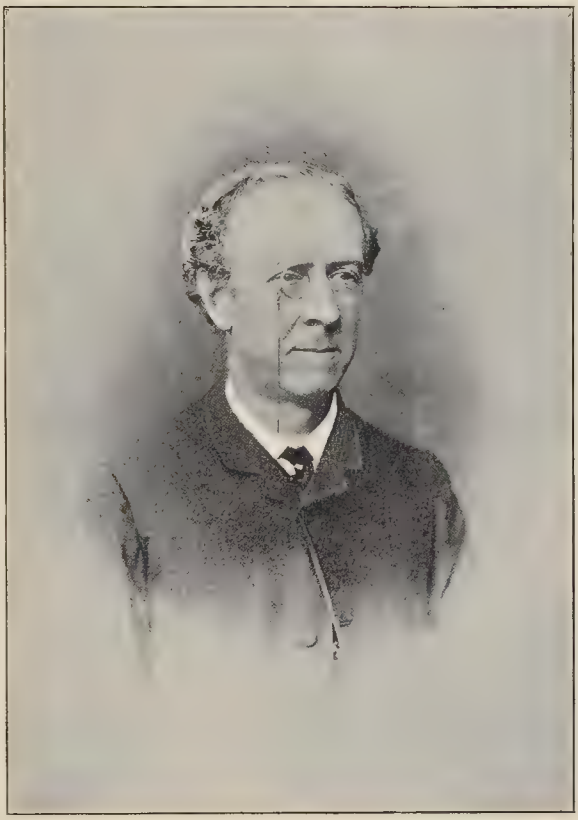
HOUSES, QUEEN'S GATE, KENSINGTON.

OF these ten houses, designed in one block, one is now completed; the erection of the other, for which tenders have been obtained, is delayed for a time. The houses are of red brick and red stone. The interior of the one already erected is very elaborately finished. The hall is panelled in oak, and the staircase is of oak; the billiard-room is lined with cedar, worked by Mr. Nicholl, from the architect's designs; the dining-room is lined with walnut, and the drawing-room has an elaborate mantel-



No 1860 Royal Academy Exhibition 1891

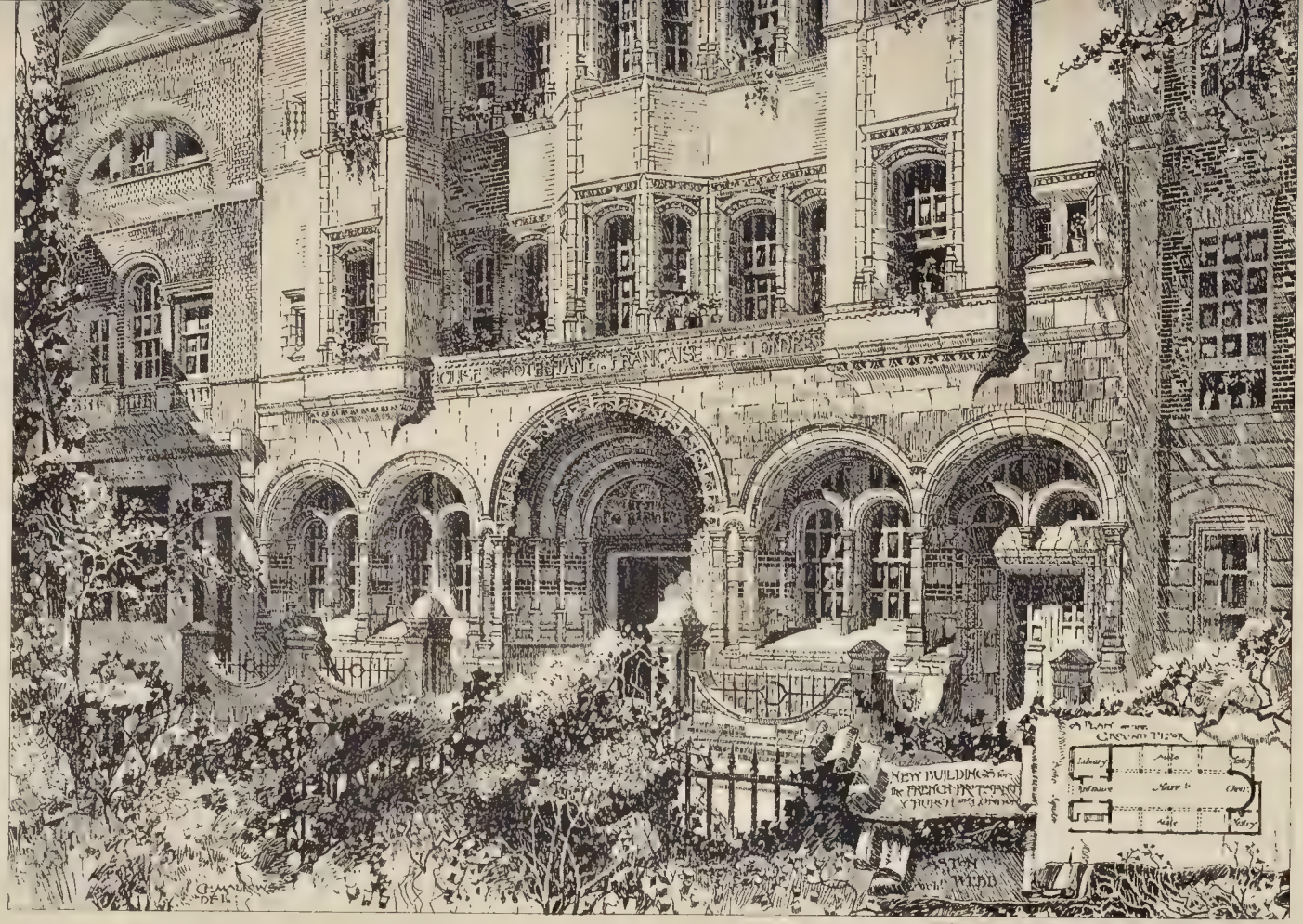

St EDMUND'S
BUNGAY 1890-91
VIEW OF NEW NAVE &c
Bernard Smith Archt



Sir Arthur Blomfield, R.A.

ROYAL GOLD MEDALLIST, INSTITUTE OF ARCHITECTS, 1891.





NEW CHURCH AND PARSONAGE FOR THE FRENCH PROTESTANT CHURCH, LONDON.—Mr Aston Webb, F.R.I.B.A., Architect.

No. 1843 Royal Academy Exhibition 1891

piece of Hopton Wood stone, with two figures in a deeply-recessed niche in the centre of the fireplace. The architect is Mr. William Emerson.

SKETCHES AT MANSFIELD COLLEGE.

THESE sketches represent various points in the interior of Mansfield College, Oxford, the architect of which is Mr. Basil Champneys. The first shows the top of the main staircase leading to the library; the second the interior of the dining-hall, the third the interior of the library, the fourth the pulpit and canopy, the latter of which was a special gift; the fifth is a corner of the chapel stalls.

The pulpit, canopy, and stalls were executed by Mr. R. Bridgeman, of Lichfield; the rest of it is by the contractors, Messrs. Parnell, of Rugby. All the internal wood work is of oak. The sketches are by Mr. Raffles Davison.

FIGURE FOR MAGDALEN TOWER, OXFORD.

WE give an illustration of a figure of St. Mary Magdalen which has been modelled by M. Conrad Dressler for the tower of Magdalen College Oxford.



Sketch for the Statue of St. Mary Magdalen, for one of the four niches at the top of Magdalen Tower, Oxford.—By Mr. Conrad Dressler.

The tower is at present under the architectural care of Mr. E. Prioleau Warren, who sends us the following account of the present condition of the tower and of what is being done to preserve it, which will be of interest to our readers:—

"*Magdalen College Tower, Oxon.*

SIR,—Having been commissioned by the College to examine the upper part of the tower during the last winter, I found that the face of the masonry, the window mullions and tracery, and the numerous grotesques, foliage bosses, and other ornaments were in very bad, and in many cases dangerous, condition.

Much of the work having been originally (in the early part of the XVIth. century, when the tower was completed) face-bedded and executed in a rather perishable local stone, it had suffered extremely from weather, the ashlar had become disintegrated and rotten, while the grotesques—many of which have a projection of about 2 ft. from the outer face of the tower—had been split and broken by the action of snow and frost. One, indeed, of the larger grotesques had fallen from the Tower last spring, and passing through the College roof, had lodged exactly upon the pillow of a—luckily absent—undergraduate.

Some of the grotesques and foliage bosses I found to be decayed beyond recognition, and to be crumbling away. The worst of these have had to be cut out and new ornaments substituted in Milton stone, which, though a free carving stone, weathers extremely hard. But by far the greater number I have been very glad to find capable of preservation by the use of Tabery's Metallic Stone Cement, which is filled into all fissures and holes in the upper surface of the ornaments, and dressed into a small depressed weather gable to throw the water off right and left of the ornament. All fissures and open joints of the string-courses are being filled with the same substance, in every case carefully coloured to match the old stonework. The statues which occupy the niches of the pinnacles in the centre of each face of the parapet have been examined with the rest of the work, and one of them, an extremely rough and clumsy figure of the Magdalen, occupying the south-eastern niche, facing the bridge, was found to be split from head to foot, all the roughly-carved drapery being sliced off the front. This statue was standing loose in its niche, and was beyond repair. It was decided, therefore, to replace it by a new statue, and to make no attempt at copying the old one (the remains of which will be carefully preserved in the College), but to commission a sculptor to design a new statue of the Magdalen, to be executed in a harder stone. The choice of the College fell upon Mr. Conrad Dressler, who after careful inspection of the tower and niche, and of the other old statues, and after consultation with the architect, prepared sketches in clay, to scale (one of which is illustrated) and finally modelled the statue full size, and sent down a cast, which was duly hoisted to the niche, toned down to harmonise with the stonework,—and inspected by the President and other members of the College, with Mr. Dressler and the architect. It was then seen that, with some slight alterations needed for the height at which the statue is to stand, it was well suited to its place as a piece of architectural sculpture; and the final statue in Ancaster stone will shortly be placed in the niche.

I am having careful detail photographs taken upon the scaffolding of the various ornaments and grotesques, which I shall be happy to place at your disposal for publication a little later on; also photos of the tower, with and without scaffolding, and measurements of the tower.

I think it is worthy of notice that Magdalen College has set a useful example to Oxford in acknowledging the nineteenth century, and employing a young artist of recognised talent, in place of a firm of tradesmen,* to supply their sculptural requirements, and I may say for myself that it has given me the greatest pleasure to be able to co-operate with a brother artist in this matter, and to illustrate my belief in the necessity of brotherly co-operation between sculptor and architect.

Forgive this long letter, and believe me, yours very faithfully, E. P. WARREN.

June 15, 1891.

P.S.—What new carving has been necessary to bosses, &c., has been very well done by Mr. Lawrence Turner, of London.

Much of the mullions and tracery of the eight great windows having been extremely badly executed some forty years ago in soft Headington stone, and riddled with iron saddle-bars (which, of course, have split the stone), has had to be entirely removed,—all the new work being done in Milton stone. The builder is Mr. G. Benfield, of Oxford."

THE COMPETITION FOR PUBLIC BATHS AND WASHHOUSES IN HORNSEY-ROAD.

THE provision of suitable baths and washhouses for the extensive parish of St. Mary, Islington, was referred to by us at the time of the awards in the competition for the first block of baths, to be erected in the Caledonian-road. The competition for the second block of baths and washhouses, to be erected in Hornsey-road, has just been completed, and out of seventeen sets of designs sent in, by the award of the assessor, Mr. Charles Barry, the first and second premiums have been allotted to Mr. A. H. Tiltman, who, it will be remembered, occupied the first place in the previous competition; whilst the third premium has been awarded to Messrs. Spalding & Cross.

* We need hardly say that we are in entire accordance with Mr. Warren in this opinion.—ED.

The site may be said to be L-shaped, with the narrow end abutting upon Hornsey-road, and the conditions for the guidance of competing architects stated that this frontage must, with the exception of a fitting approach to the baths, be utilised for shops. These shops were to be included in the design, but not in the estimated cost of the baths, which was limited to 23,000*l*. The whole of the site was not required for the new buildings, and the question of approach to any apartments placed at the back was a problem which received an attempted solution, in which nearly all competitors differed.

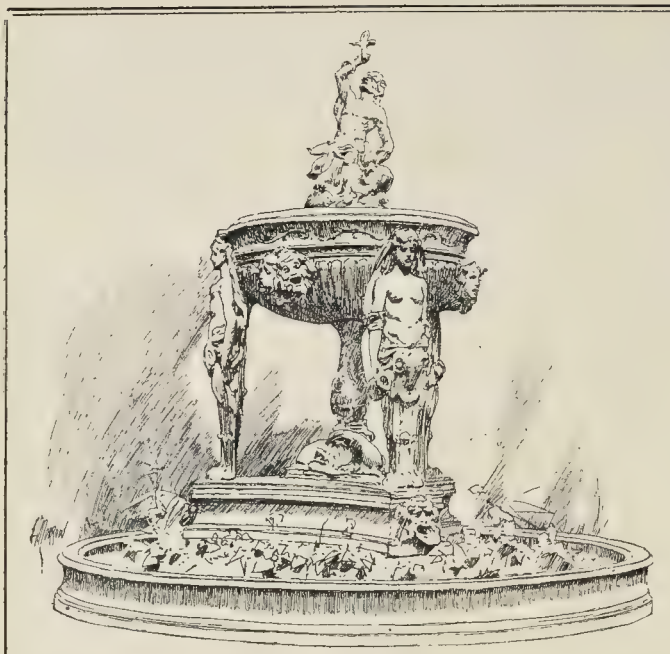
The points which received the attention of the assessor in making his awards are mentioned in his report, and as they summarise the most essential requirements of the case they may be briefly stated as follows:—The plans to have easy and direct access to each of the three swimming-baths, and without access from the land at the back; easy and direct supervision by the resident manager; men's first-class swimming-baths to have easy and short access from Hornsey-road, with good approaches and exits; position of pay-boxes so that one may control all the baths; easy access to all water-pipes; good lighting and natural ventilation; convenience of access and sufficiency of accommodation in the public laundry department; the relative cost of the design.

Mr. Tiltman has placed an arcaded entrance in the centre of the Hornsey-road, with the manager's residence above, and three shops on each side. This entrance leads directly into a moderate-size quadrangle, with the entrances to the baths immediately opposite. The laundry buildings are placed in the north, whilst a space on the south is left for the erection in the future of Turkish baths or additional slipper-baths, as may be required. Between the two entrances mentioned is placed the one pay-box, and past this all must pass in making their way to the separate departments, except to the laundry, which must necessarily have a distinct entrance. The arrangement is certainly the most economical for administration. Behind the pay-box, and with its longer axis at right angles to Hornsey-road, the men's first-class swimming-bath is placed, and this is surrounded by a corridor in connexion with the men's and women's entrance already referred to. The value of this corridor is at once apparent when it is understood that this, the largest bath, is to be used at times as a large meeting-hall, which must be provided with every means of rapid exit in case of any panic that might arise. These corridors are perfectly straight, and are provided with exit-doors on to the vacant ground, which may be used as required.

The women's first and second-class slipper-baths occupy the other side of the corridor, and the women's swimming-bath is placed at the end of the corridor behind the large bath. A somewhat similar arrangement is adopted on the opposite side, but the men's second-class swimming-bath has been placed at right-angles to the corridor, and round the corner of the site, so to speak. The position of the waiting-rooms to the different departments, so placed that they may at times be used as cloak-rooms, seems to be convenient. There is no doubt that this plan is a good one, and more nearly meets the requirements of the case than any other amongst those submitted. Mr. Tiltman has indicated a new road with blocks of houses at the back of the baths. This arrangement would be a good one, no doubt, and would give access from the back, which would be a great advantage. The elevations are suitable to the building, and are marked by a quiet and dignified treatment of Late Renaissance. One or two slight improvements can easily be made in execution.

The second set of designs submitted by Mr. Tiltman differs materially in arrangement. The quadrangle has been omitted, and the men's slipper-baths are transferred to the back, where they are placed in a somewhat involved position. This plan lacks the simplicity of that already mentioned, and they cannot, in our opinion, be compared.

The plans to which the third premium has been given are by Messrs. Spalding & Cross, and show a central entrance with three shops on either side. The superintendents office is placed in the centre of the front, between the two entrances, with a pay-box behind, and two straight corridors on either side of the large swimming-bath placed on the north side behind the pay-box, give access to the women's baths and the men's slipper-baths, and the men's



Model for a Fountain. No. 1,977, *Royal Academy Exhibition.—By Mr. G. W. Wilson.*

second-class swimming-bath. The laundry is placed at the back, with an entrance from the back. The plan shows some want of simple grouping in the arrangement of the apartments, and the entrance to the laundry from the back does not appear to be a good arrangement. The whole of the baths being served by one pay-box, has, no doubt, led to this set securing a premium.

Only one other competitor appears to have planned a courtyard, and that is Mr. H. T. Shere, who submits a design with many good points and elevations of some merit; but the multiplication of pay-boxes and the want of good direct access to the laundry, which is placed at the back, has prevented this design receiving further recognition.

Want of space prevents detailed reference to the remaining designs, but there seems every reason for endorsing the award of the assessor in this competition.

MODEL FOR A FOUNTAIN.

THIS is the fountain model which forms the central object in the Octagon Hall at the Royal Academy Exhibition. It is reproduced from a sketch furnished by the artist, Mr. G. W. Wilson.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon at Spring-gardens, the Chairman, Sir John Lubbock, presiding.

Management of Parks and Open Spaces.—The General Purposes Committee presented the following report relative to the proposed appointment of a Superintendent of Parks and Open Spaces:—

"In accordance with the resolution of the Council of May 12, we have reconsidered the question of the desirability of increasing from 500*l.* to 700*l.* a year the salary to be attached to the office of Superintendent of Parks and Open Spaces, an office which the Council, on June 10, 1890, resolved to create. We thought it right to again consult the Parks and Open Spaces Committee on this subject, and we are informed that that Committee, after full consideration, cannot come to any other conclusion than that the views previously put forward by them are right, and in the interests of the Council should be adhered to. Having heard the Chairman and other members of the Parks Committee, and again carefully considered the matter in the light of the discussion at the Council, we have resolved to submit once more to the Council the recommendation previously made. Our report, which was before the Council on May 12, states so fully the reasons for the recommendation, that we have little to add to it. We will only mention that the Parks Committee are desirous of removing an impression conveyed to some minds that the Committee wish the new Superintendent to possess attainments more of a scientific than of a practical nature. They say that to direct efficiently the various superintendents and the large staff of gardeners and others (in all 480 men) employed on the parks and open spaces, and to advise the Committee on technical points, it is necessary for the general superintendent to have a knowledge of horticulture, but they lay greater stress on the requirement that he should be a man of thorough business capacity and experience in the management of men. It is proposed, if the Council adopts the recommendation, to indicate this requirement clearly in the advertisement. Having regard to the duties that will devolve on the superintendent, to the number of parks, gardens, and open spaces scattered throughout London that he will have constantly to be inspecting, and to the large staff he will have to direct, we do not think 700*l.* a year too large a salary to offer. It is scarcely necessary to add that unless among the candidates there is one who fully answers these requirements, no recommendation will be made in pursuance of this proposal. We accordingly again submit the recommendation—

'That the Council do offer 700*l.* a year as salary for the Superintendent of Parks and Open Spaces.'"

Mr. Saunders moved the following amendment:—

"That, as the business of the Parks Department has been carried on in an able manner since the appointment was first proposed, it is not now desirable to appoint a Superintendent, especially as artistic assistance can be obtained from experts when required."

He contended that the proposed appointment was entirely unnecessary, inasmuch as the work was very efficiently done by Mr. Sexby, of the Architect's, and by Mr. Nairn, of the Clerk's, department.—Colonel Rotton seconded the amendment, on the ground that to appoint one official to have sole control over the parks and open spaces would be to destroy the beautiful diversity which they at present presented.—On the other hand, several members of the Parks Committee spoke of the inconveniences which arose from the present dual management, and, with Mr. Dickinson, the Chairman of the Committee, maintained that the proposed appointment would result in great economy of management in regard to the effective employment of the large staff of men engaged in the parks or on the open spaces.—The amendment was negatived, on a division, by 50 votes against, to 39 for.—Mr. Westacott moved, and Mr. Tims seconded, a further amendment fixing the salary of the proposed office at 500*l.* per annum. This was lost, on a division, by 41 votes against, to 38 for.—On the recommendation of the Committee being put from the chair, another division was challenged, and, curiously enough, there then voted: For the recommendation, 40; against, 41. The recommendation was, therefore, lost.

Tenders.—The General Purposes Committee also presented a report on this subject, saying:—

"We have again considered what would be the most practicable course to stop the practice which has been so prevalent, and which has been found very inconvenient, of withdrawing tenders after they have been laid before the Council. The suggestion made in our previous report—that persons tendering should be required to deposit with their tender a sum of money to be forfeited in case of the tender being withdrawn,—seemed to many members of the Council to be open to objection. We find it also doubtful whether such forfeiture could be legally enforced, and upon further consideration, therefore, we do not recommend its adoption. We think, however, that something ought to be done, and after considering various possible courses, we are of opinion that it would be well to follow the course adopted by many of the large municipal corporations,—that is to say, that tenders shall be opened by Committees and not publicly by the Council. The only name and amount reported to the Council should be that of the tender recommended for acceptance, provided, however, that if a Committee recommended the acceptance of a tender other than the lowest, the Committee should explain the matter to the Council. As this practice works well in corporations such as those of Manchester and Liverpool, we see no reason why it should not work equally well in London. We therefore recommend—

'That Standing Orders Nos. 190 and 191 be repealed, and that in place thereof the following order be made—

'All tenders shall be opened by the Committee concerned and initialled by the Chairman of the Committee. The Committee shall report to the Council the tender which it recommends for acceptance, but no other names and amounts shall be publicly reported to the Council. In the case, however, of a Committee recommending the acceptance of a tender which is not the lowest, the Committee shall specially report the same to the Council.'"

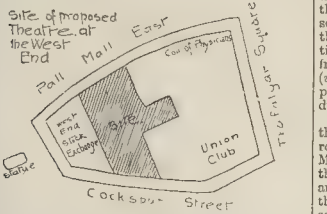
Mr. Benn moved the following amendment:—

"That in the opinion of the Council it is not expedient to diminish the publicity which now attends the opening of tenders by the Council, but that the General Purposes Committee be requested to consider the desirability of extending the operation of standing order No. 193 so as to provide that the Council will not accept the tender of any person who shall on any previous occasion have withdrawn a tender after the same has been opened by the Council or the Committee concerned.'

He said that the proposal made by the Committee would lead to worse evils than obtained under the present system, for it would put a premium upon divulging information. What the Corporations of Manchester and Liverpool might do with impunity, on account of their fifty years of experience, they in London might not do. The *Times* said the other day that the London County Council was incorruptible, but if the proposal of the Committee were adopted it would at once be said that they were corrupt jobbers because they opened tenders and decided upon contracts in secret.—Mr. Beachcroft seconded the amendment, and said that as there was a great falling-off in the attendances of members at Committee meetings, it would be most inexpedient to entrust Committees with such large powers.—Sir Thomas Farrer, Vice-chairman of the Council, defended the recommendation of the Committee, on the ground that the course proposed was necessary, and was the one adopted by Government departments.—Colonel Edis supported the amendment, on the ground that it would be exceedingly undesirable to open tenders and accept them with closed doors. In saying that, he wished to express his dissent with the Council's practice of throwing open tenders for works to everybody. It was not productive of good results, and no business man of experience would adopt such a course. The best results were obtained by having a selected list of persons from whom tenders for various works might be invited, the lists, of course, to be revised from time to time. In his experience of thirty years as an architect he had found that that was by far the best course to pursue.—Mr. Lawson, M.P., said that the list system had been tried by the London School Board, and had failed, as under it all their bad buildings were erected.—Mr. Roberts, who supported the amendment, said that Mr. Lawson was in error. The bad schools of the Board were the result of "open tendering." The Board had now reverted to the list system.—Mr. Brereton said that although he agreed with what Mr. Edis had

said as to "open" and "limited" tendering, he felt bound to support the recommendation of the Committee, as it was, in his opinion, absolutely necessary to put a stop to the too frequent practice of people who had submitted the lowest tender withdrawing it before it was sealed. He thought there was no fear of corruption or divulging information.—On a show of hands being taken, 31 were held up for the amendment and 24 against it, so that the amendment was carried.—A division was not demanded.

The Proposed New Theatre in Cockspur-street.—On the motion for the adoption of the Theatres and Music Halls Committee's report on this subject (printed in last week's *Builder*, p. 489),—Mr. Leon moved an amendment to the effect that the Council should disagree with the recommendation that the drawings be approved, on the ground that the site was a most unsuitable one. He said that on the face of it the recommendation was a very weak one. Pointing to a block plan of the site, of which the accom-



panying diagram is an approximate representation, made from a rough sketch during the discussion, the etched portion showing the proposed theatre site, Mr. Leon contended that this site, hemmed in by buildings on its two longer sides, was quite unsuited for a theatre, and the two narrow frontages, 64 ft. to Pall-Mall and 56 ft. to Cockspur-street, were too limited to allow of safe means of egress in the event of fire or other panic.—Mr. Roberts seconded the motion, remarking that if the whole block or island were taken it would be an ideal site for a theatre.—Col. Rotton defended the recommendation of the Committee, on the ground that the Council should not stand in the way of legitimate enterprise.—Mr. Fardell, the Chairman of the Committee, also defended the recommendation on the ground that the structure would be fireproof.—On a show of hands being taken, there was a tie, 27 members voting for the amendment, and 27 against. A division being demanded, there voted 32 for the amendment, and 33 against it. The amendment was therefore lost by 1 vote, but it being then seven o'clock, after which hour no opposed business can be taken, the original recommendation could not again be put, and so the matter stood adjourned at the rising of the Council.

The Council's Offices.—Colonel Edis has placed the following notice of motion on the agenda paper,—

"That, having regard to the extreme inconvenience caused by various branches of the Council's work having to be carried on at some considerable distance from the head office, and to the crowded state of the existing offices, it be referred to the Offices Committee to report what additional accommodation could be obtained by adding another story to the present main building in Spring-gardens, and at what cost, and, further, whether it be possible to obtain the freehold or long leasehold of houses in the immediate neighbourhood with a view to adapting them for the Council's purposes, and so centralising the necessary offices around the main building."

POST OFFICE, DUNGANNON.—A new post office has just been made open to the public at Dungannon. The building is built on a semi-octagon principle. It comprises a two-story block, with a frontage of 50 ft. The outside facing of the building is of red brick, with white arches over the windows, and surrounded by string courses of white brick, all of Belfast manufacture. The inside walls are of freestone, from the quarries of Mullaghna and Carland. The post office department consists of a room for the accommodation of the public. Adjoining the public office there is a department for the private business of the postmaster. The postmaster's household compartments embrace five bedrooms, parlour, drawing-room, scullery, larder, and kitchen. In connexion with the post office there is also erected an estate office, the property of the Earl of Ranfurly. The buildings now erected were contracted for by Messrs. John Lowry & Sons, of Belfast. The architect was Mr. C. A. A. Owen, of Dublin.

Correspondence.

To the Editor of THE BUILDER.

"PULCHRITUDO ET SALUBRITAS."

SIR,—Bournemouth has recently been made a borough, and has adopted the above as its motto. The boundary line has been drawn in such an arbitrary manner that on all sides the roads and houses spread far beyond it, and some of the most populous districts are left to shift for themselves, being consequently utterly void of a drainage system and other signs of civilisation. To say that these districts are not part of Bournemouth is equivalent to saying that Charing-cross is not part of London, because it is outside the City proper. Broadly speaking, inside the boundary-line is wealth and sanitation—outside poverty and cesspools.

The town is still spreading like a prairie fire, but with almost Continental indifference to such trifles as drainage. The inhabitants of the outlying districts wish their neighbourhoods to be included in the borough, so as to share the advantages of sewerage, &c., but the Town Council are divided on the point, so nothing is done, and the builders continue to construct cesspools by the hundred. So far from making them 50 yards from the building (*vide* article in the *Builder* for June 13), the building plots in most cases do not measure 50 yards in any direction.

As the borough is so ill-defined that in one case the boundary-line passes transversely through a row of houses built *en bloc*, and as the British Medical Association are about to visit Bournemouth, the Town Council had better see that the doctors are properly guided in their walks abroad, in case they unconsciously overstep the magic circle, and see what they ought not to see.

Probably at the Medical Congress the death-rate will be trotted out; but will the figures be corrected so as to include the cesspool area?

I have no wish to decry Bournemouth, quite the contrary, but I think it is a pity that such a beautiful place, with great natural advantages, should suffer sanitary neglect owing to the clashing of rival interests or any other cause.

I suppose the moral of all this is that the public health is too important a matter to be entrusted to bodies of local individuals. HEALTH-SEEKER.

A NEW CLERKS OF WORKS "INSTITUTION."

SIR,—Can you give me any information as to the new "Institution" for Clerks of Works, advertised in your last issue (p. xxi.)?

AN OLD CLERK OF WORKS.

*** We have made inquiries, and learn that Mr. H. Hackett is the Secretary, and Mr. J. Haines the Treasurer. At present, Mr. Hackett informs us, the "Institution" numbers five members, and there are eight applications for election to membership at the next meeting. A copy of the form of application for membership has been sent to us, and from this form we learn that "to be eligible for membership, the candidate must have been employed, as clerk of works only, during the two previous years, or for four consecutive years at some former period." We must confess that, on the information already before us, we hardly see the need for a new institution of the kind. We should have thought that the ground was already amply covered by the two existing societies, the Clerks of Works Association, and the Provident Institution of Builders' Foremen and Clerks of Works.

KIRKSTALL ABBEY.

SIR,—I thank Mr. St. John Hope for his correction, and apologise to Mr. Micklethwaite for my mistake.

Practically speaking, ivy must have preserved old walls from decay, because there has been no other care taken of them, but it is impossible to "give any examples when the growth of ivy . . . . has aided in preserving old ruins," from the fact that no idea can be formed of what their state would be without it. What man neglects, nature cares for. The advisability of dressing up ruins to go to ruin again is an open question,—protection is necessary, and exposure of *wrought* work that is buried is interesting, such as base courses, old floors, &c. When foundations are only traceable, could not some permanent evidence of their existence be made, say, by planting yew hedges, or something of that kind?

Ruins, as a rule, have to a certain extent lost their architectural significance, in detail, and retain it principally in form; which is not altogether hidden by ivy. What is left to the imagination is that which makes a ruin pleasing and picturesque: Kirkstall Abbey, as an example, has to a great extent lost both characteristics.

J. W. BENWELL.

25, *Park-square, Leeds.*

The Student's Column.

VENTILATION AND WARMING.—XXV.

PRACTICAL APPLICATION AND CALCULATIONS (*concluded*).

IN planning the heating-apparatus for such a building as that we have taken for our example, a point of considerable importance to be determined is the frequency with which, during cold weather, the building is likely to be used.

The importance of this point arises from the fact that when a building has become thoroughly cooled down to a low temperature, a large amount of heat is necessary to raise it again to a standard temperature sufficiently high for economical and agreeable occupation.

It is, therefore, better when the building is used at tolerably frequent intervals to maintain the standard temperature instead of allowing it to fall, and if the building were used, say, three times a week, it would be cheaper in the consumption of fuel to adopt this course. As such a building as that we have in view could hardly be made to pay unless it were used at least three times a week, and would probably be so used, at any rate during the winter months, we will suppose that we are going to maintain the temperature, and we shall, therefore, in view of what has been said in Chapter XXIII. on the various descriptions of heating apparatus, find a low pressure hot-water apparatus most suitable for our requirements. This, therefore, we will adopt with 4-in. pipes, and base our calculations upon this assumption.

In view of the large amount of ventilation which we are providing we shall find that the greatest tax upon our heating apparatus will be the warming of the fresh air supply. With this, therefore, we will commence. We have to warm a fresh air supply of 1,500,000 cubic feet per hour, and we will assume that our apparatus is to be sufficient to raise this quantity of air 20 degs. Fahr., say, from 32 degs. to 52 degs. As in the process of heating, the volume is constantly being altered by expansion, it is more convenient to make our calculation for a given weight of air, which remains constant, rather than for a variable volume. Atmospheric air at 52 degs. Fahr. weighs ·0776 lb. per cubic foot, and the weight of 1,500,000 cubic feet at that temperature is, therefore, $1{,}500{,}000 \times {\cdot}0776 = 116{,}400$ lb. The specific heat of air is 0·238; the number of heat units required to raise our quantity of air 1 deg. Fahr., is, therefore, $116{,}400 \times 0{\cdot}238 = 27{,}703{\cdot}2$ and for 20 deg. $27{,}703{\cdot}2 \times 20 = 554{,}064$ heat units.

From the data given in Chapter XXI., we find that 1 ft. superficial of 4-in. cast-iron pipe at a mean temperature of 150 deg. Fahr. will give off to air at a temperature of 32 deg. Fahr., 233 heat units an hour; we therefore require, in order to obtain 554,064 heat units an hour, $554{,}064 \div 233 = 2{,}378$ ft. super. of external surface on our 4-in. pipes. At 10 in. run to the foot super. this will give us 1,982 ft. run, the length of 4-in. pipe which we must provide to warm our 1,500,000 cubic feet of air hourly.

We will now investigate the cooling action of our walls, ceiling, and floor. Taking the length of our walls at $80 + 80 + 35 + 35 = 230$ ft., and multiplying by their height, 22 ft., we have $230 \times 22 = 5{,}060$. Deducting area of doors, 152 ft., and of windows, 960 ft., we have $5{,}060 - (152 + 960) = 5{,}060 - 1{,}112 = 3{,}948$ ft. super. for the net area of the walls. From Chapter XXI., we see that for each degree Fahr. of difference of temperature, the loss of heat per foot super. is $W = 361 + \frac{\cdot 233}{\sqrt{22}} = {\cdot}361 + \frac{\cdot 233}{4{\cdot}69} = {\cdot}361 + {\cdot}05 = {\cdot}411$.

And for an assumed difference of 30 deg. we have $\cdot 411 \times 30 = 12{\cdot}33$ heat units per foot super. hourly. Therefore, for our whole wall surface, we have $3{,}948 \times 12{\cdot}33 = 48{,}692$ heat units. The loss by the windows, taking it at 12 heat units per foot super., is $960 \times 12 = 11{,}520$, and for the doors at 5 heat units per foot super., $152 \times 5 = 760$. For the floor and ceiling, as they are of the same area, $80 \times 35 = 2{,}800$ feet super., we may take a total loss of 6 units per foot, that is $2{,}800 \times 6 = 16{,}800$. Our whole loss for the enclosure of the hall is, therefore, $48{,}692 + 11{,}520 + 760 + 16{,}800 = 77{,}772$ heat units.

Against this we have to calculate the heat given off by the occupants, which is at the rate of 191 heat units hourly for each, that is $191 \times 400 = 76{,}400$, so that the heat given off by the audience is about sufficient to compen-

sate for the heat absorbed by the structural enclosure of the hall.

The heat evolved, when the gas is lighted, by its combustion will be about 450 heat units for each cubic foot, that is $450 \times 300 = 135{,}000$ units hourly, so that we shall thus have an ample margin for a lower external temperature than we have assumed as the basis of our calculation.

We must not forget that our fresh air chamber below the floor of the hall will also absorb some of our heat; this is to be calculated in the same way as for the hall itself, and amounts to about 34,000 heat units hourly. For this we should allow $34{,}000 \div 233 = 146$ ft. super. or 122 ft. run of 4-in. pipe.

The whole length of our pipe will, therefore, be $1{,}982 + 122 = 2{,}140$ ft. These figures at once show us the importance of taking into consideration the matter of ventilation and its amount when making calculations for heating apparatus. In the ordinary way and without any special ventilation the usual rules adopted by hot-water fitters would give about 460 ft. as the length of 4-in. pipe for warming a hall of the cubical capacity of our example. This would, of course, be lamentably inadequate.

In order to apply our heating apparatus to the economical warming of the hall and its contained air prior to occupation we should make arrangements for the fan to draw its air-supply when desired from the hall instead of from the external atmosphere. We could then rapidly draw the cold air from the hall, warm it by means of our apparatus, and keep it circulating through the hall at a temperature sufficient to raise that of the walls, &c., to a point which would prevent them from chilling the occupants to an uncomfortable degree.

In the case of a hall used for a variety of purposes, such as we have supposed, the hot-water-pipes should be so arranged that a part only of the system may be heated when required. Thus when the amount of ventilation is below the maximum for which we have provided, and consequently less heating power is required, we should be able to work economically by using part only of the system.

The large extent of 4-in. pipe we have found to be necessary explains the reason why, when a considerable supply of fresh air is required, it is often advisable to use steam or high-pressure hot-water-pipes for warming the fresh air; that is on account of the less space occupied by the smaller pipes of high temperature and quick circulation. In the particular instance we have under consideration, with a fresh-air chamber below the floor of the hall, we have ample space at our disposal for the large amount of pipe required, and the adoption of the particular system proposed gives us the advantage of an equable distribution of heated surface of large extent and comparatively low temperature, which gives a more pleasant and healthy character to the air than the use of less surface and higher temperature.

In making our calculations for the power of our ventilating apparatus it will be remembered that we took no account of the aid to ventilation afforded by the heat of the gas-lighting. In so doing we were acting rightly, for our hall may be used sometimes for a crowded meeting by daylight when the gas is not burning, and we must therefore provide for such contingencies. If we could always depend upon the gas being alight when our hall is fully occupied, we may rely upon its assistance for our ventilation. We have found that the gas develops 135,000 heat units hourly by the process of combustion, and this is sufficient to raise the temperature of our 1,500,000 cubic feet of air about 6 deg. Fahr., supposing it to enter at 52 deg. We have therefore a mean temperature of $\frac{1}{2}(52+58) = 55$, and assuming the external atmosphere to be at 30 deg. Fahr., by reference to Chapter VIII. we see that we can calculate the potential velocity due to the heat of the gas, thus

$$v = \sqrt{\frac{2g\ H\ (T - t)}{491 + T}}\ ;\ 2g = 64{\cdot}36 \text{ feet, and}$$

is usually taken at 64.

$$T = 55,\ t = 30,\ H = \text{say } 36 \text{ feet.}$$

$$\therefore v = \sqrt{\frac{64 \times 36 \times 25}{491 + 55}} = \frac{8 \times 6 \times 5}{\sqrt{546}} = \frac{240}{23{\cdot}36}$$

$$= \text{say } 10 \text{ feet per second.}$$

This is the potential velocity, that is, the velocity which might be obtained if there were no obstruction by friction of ducts, &c.; but, as we have already seen in the last chapter, there is a considerable deduction to be made from this for the resistance of the ducts, and also for that of the ceiling and outlet-shafts, which we might, if we pleased, calculate by the help of the data given in Chapter XII., and which would amount to about $\frac{1}{2}$. We have seen that we require a velocity in our outlet-shafts of over 7 ft. per second, and as we have for the actual velocity from the heated air about 5 ft. per second, this would be not quite sufficient to effect all the ventilation we desire, though it would enable the fan to be run at about half-speed.

Thus we have seen how calculations are made for determining the power required for ventilation, the effect of heated-air currents as an aid to ventilation, and for the extent of warming apparatus required. Other problems, whether for more complicated or for simpler buildings, may be treated in a similar fashion, according to their particular circumstances, the only universal rule for all ventilation problems being that no one system, no one apparatus, no one method, is equally applicable to all cases, and that each must be treated on its own merits, with a full consideration of all the factors and conditions of each individual case.

GENERAL BUILDING NEWS.

TRINITY U.P. CHURCH, POLLOKSHIELDS.—The memorial-stone of the new Trinity U.P. Church, Glencairn Drive, Pollokshields, was laid on the 19th inst. by Mr. Robert Gourlay. The plan of the building is that of a nave with aisles on each side. The choir (is carried the full width of the nave, about 20 ft. deep, and finished as a half-hexagon. At the main entrance a portion of the area is given up to a vestibule, to the right and left of which are the staircases leading to the small gallery over the vestibule. There are no side galleries. The front gable is about 70 ft. high to the top of the cross which crowns the pierced and ornamental parapet. To right and left stand towers, nearly 90 ft. to the top of their carved stone terminals. The lower part of the gable is taken up by a double doorway forming the main entrance, the upper parts of which are detailed, and the arch formed into panels filled with figure-work embracing Old and New Testament subjects. On the south side the hexagonal choir is situated about 10 ft. lower than the roof of the nave, having three windows with traceried tops. At the south-west corner stands the building containing the session-house and vestry, with church officer's house upstairs. The nave has arcades separating east and west aisles, carried on polished granite columns. The pulpit is placed on the east side of the chancel arch, the font to the west, with the organ filling up the end of the chancel. The fittings within the chancel arch will be wrought in oak, with foliated carvings, traceried panellings, with the exception of the pulpit and font, which will be built of red stone, green marble, alabaster, and Mexican onyx, ornamented with canopied work and foliated carvings. The choir windows will be filled by stained glass, the gift of the Rev. Mr. Jeffrey, in memory of his father. Mr. Rowan, of Glasgow, is the architect, and the edifice when completed will cost 8,000*l.*

WESLEYAN CHAPEL AND SCHOOL, NEWMILLERDAM.—On the 16th inst. a new Wesleyan Chapel and school were opened at the village of Newmillerdam, near Wakefield. The new buildings, which have cost about 1,500*l.*, are in the Gothic style, and have been erected from the plans of Messrs. Thornton, of Wakefield.

MINERS' HALL, USWORTH, DURHAM.—On the 20th inst. the foundation-stone was laid of a new hall for the miners of Usworth Colliery. The building will be in the Italian style, and is to comprise a hall, capable of seating 500; committee-rooms and lobby on the first floor; second floor, reading-room, smoke-room, and billiard-room. There will also be a checkweighers' house. The estimated cost when completed is expected to be 2,000*l.* Messrs. Davison & Bendle, of South Shields, are the architects, and Mr. Maughan, of Lemington, is the contractor.

WESLEYAN SCHOOLS, HARPURHEY.—On the 20th inst., four memorial stones of the new Wesleyan Schools, Harpurhey, Lancashire, were laid. The building, which has been designed by Mr. J. Gibbons Sankey, architect, of Manchester, will be in the English Renaissance style,—the front being of brick and Ruabon terra-cotta. The large school-room will seat about 800 people, the lecture room 300, the junior school 200, and the infant school 180. The total cost of the building will be 3,000*l.*

REBUILDING OF FALDINGWORTH CHURCH, NORTH LINCOLNSHIRE.—The parish Church of Faldingworth, North Lincolnshire, has just been re-opened, after being rebuilt,—all except the tower,—at a cost of 2,200*l.*, the contractors being Messrs. H. S. and W. Close, of Lincoln, and the architect, Mr. C. Hodgson Fowler, F.S.A., of Durham.

ADDITIONS TO THE HOME FOR THE AGED POOR, LIVERPOOL.—On the 18th inst. the north-west wing, just added to the home of the Little Sisters of the Poor, Belmont-road, Liverpool, was opened. The new wing is of plain brick, and comprises cellars underneath and three storys overhead. The rooms are reached from corridors running the entire length of the building, which is set apart for the old women, the nuns only reserving for themselves a small section at right angles with the main wing, and overlooking Belmont-road. At the other end, at the junction of the old and new wings, is situated the chapel, which projects backwards, the rear thus forming three sides of a quadrangle. The basement contains reception-rooms, refectory, &c. On the first floor is the infirmary, from which a door leading from the dormitory into the gallery of the chapel enables the infirm inmates to hear mass without descending. A partition divides the gallery into two. The women have a sitting-room, lit by six high windows, at their disposal. An iron balcony runs the length of the back, where convalescents can take the air. The chapel, which can seat 300, is terminated by a chancel arch and semi-circular apse. The total cost of the structure is about 7,000*l.* *Liverpool Daily Post* says that although the building was originally designed by Messrs. Goldie, Child, & Goldie, of London, the contractors having been Messrs. Holme & Green, the Sisters, with the help of Mr. John Smith, clerk of works, have been practically their own builders.

NEW PRISON, ABERDEEN. — The new prison which has been built at Craiginches, Aberdeen, to supersede the old jail in Lodge-walk, erected in 1826, has just been completed. The site of the new edifice is an eminence on the south bank of the Dee, on the outskirts of the city. The prison walls are about 18 ft. high, and the enclosed space is about four acres in extent. The ground not built upon will be set apart for exercise-yards. There are two main blocks, one for each sex. The height of the block for males is upwards of 40 ft. to the eaves, and nearly 60 ft. to the apex, and its total length, including a chapel of Gothic design at the north end, is 135 ft. In the block there are three floors of cells on both sides. In the section there are about seventy cells. Hot-water pipes traverse vaults under the whole of the cell accommodation in the prison. There are four shafts for the extraction of the foul air in the block for males, and two shafts in the block for females. In the women's section there are twenty-three ordinary cells, a padded-cell, an association-room, an hospital, and lavatory accommodation, and the same details have been observed as in the other parts of the jail. At the north end are the quarters of the matron and of the female warders. In addition to these two main blocks, there is a house for the governor, and buildings containing separate quarters for four warders and their families. In the chapel the windows are filled with cathedral glass, and the building is divided up the centre by a partition 7 ft. high, the men being accommodated on the east, and the women on the west side. The roof shows the rafters with dressed V-jointed diagonal linings between, which will be stained and varnished. The plans for the prison were prepared under the supervision of her Majesty's Commissioners for Prisons in Scotland, and under the direction of Colonel M'Hardy, R.E. Messrs. D. Macandrew & Co., of Aberdeen, were the contractors, and the cost has been about 20,000*l.*

WESLEYAN CHAPEL, WATTON, HERTFORD.—On the 15th inst. the memorial stones of a "Wesley Centenary" Chapel were laid at Watton. The architect of the chapel is Mr. F. Boreham, of London, and the builder is Mr. D. Neighbour, of Ware. The premises to be erected comprise the chapel and a small schoolroom in the rear. The chapel and schoolroom are to be of the same height, the intention being that they shall ultimately become one, and that a new schoolroom shall be built in the rear. The building is designed on simple Gothic lines and externally will be faced with stock bricks, relieved with bands and arches of red bricks, the front doorway having stone shafts. The roof will be of slate. Internally there will be an open-timbered roof, the ceiling will be boarded and varnished, and the seats are to be of stained deal, varnished. Warming will be effected by pedestal and other stoves, and ventilation by Boyle's exhausts and fresh-air inlets. All the windows will be glazed with leaded cathedral glass.

RE-OPENING OF THE GRAND HOTEL, BIRMINGHAM.—The Grand Hotel, Colmore-row, Birmingham, was re-opened last week, after being remodelled from the plans of Messrs. Martin & Chamberlain, architects, at a cost of about 40,000*l.* The capacity of the building has been enlarged by the inclusion of half-a-dozen shops in Church-street.

RENOVATION, &C., OF PRIMITIVE METHODIST CHURCH, BELFAST.—On the 31st ult. the Black-staff-road Primitive Methodist Church, Belfast, was re-opened after renovation and enlargement. The building has been lengthened, and transepts have been erected upon the vacant space between it and the school building in Primitive-street. The reconstructions have been built with red perforated brick, with red sandstone dressings, in Early English Gothic, and the new as well as the old windows have been glazed with cathedral glass in lead quarries. The roof trusses are of pitch-pine, and the ceiling is sheeted with white wood arranged in panels, with pitch-pine mouldings. A pulpit of the platform type has also been erected, constructed of polished pitch-pine and mahogany, with wrought-iron scroll

standards, and a memorial stone font stands at one side of the pulpit. The church and school-house are heated with Musgrave's "small-bore" heating apparatus. The work has been carried out by Mr. James Kidd, of Belfast, from the plans and under the supervision of Mr. James T. Phillips, architect, Belfast.

NONCONFORMIST CHURCH BUILDING.—There is considerable activity just now in the building of Nonconformist churches. Baptist chapels are being built—one at Oswestry, to cost 2,600*l.*; one at Erith, of similar amount; and one at Ponders' End, to cost 2,000*l.* Wesleyan chapels are being built as follows:—One at Penmaenmawr, to cost 2,000*l.*; one at Willoughby, to cost 700*l.*; one at Hartford, to cost 1,900*l.*; and one Mareham-le-Fen, to cost 1,500*l.*; one at Wheatley, to cost 600*l.*; one at Whitwell, to cost 700*l.*; and one at Port Talbot, to cost 1,400*l.* For the Primitive Methodists a chapel is being built at Blyton, to cost 700*l.*; one has just been completed at Stonegravels, Chesterfield, at a cost of 600*l.*; and another at Sheepbridge, near Chesterfield, at a cost of 500*l.*; and other works are in contemplation in the neighbourhood of Chesterfield. Schools are also to be built at Tunbridge Wells, in connexion with the Baptist Tabernacle, and at Cinderford in connexion with the Wesleyan Chapel. The architect for the whole of the above is Mr. John Wills, Derby.

SANITARY AND ENGINEERING NEWS.

REFUSE DESTRUCTOR, LEICESTER.—On the 8th inst., the members of the Leicester Corporation visited the newly-erected refuse destructor, which is situated in Upper Charnwood-street, Leicester, and which has now been in working order for several months. The destructor is intended to deal with the house refuse which finds its way to the dust-boxes, and is collected periodically by the Corporation dust-carts. The system is Manloves, Fryer, & Alliott's, and this firm supplied the furnaces in which the process of combustion takes place. The destructor contains six cells, and is capable, it is said, of dealing with over 200 tons of house refuse per week. It has been designed by the Borough Surveyor, Mr. E. G. Mawbey, C.E., who has combined with Messrs. Manlove's furnace system one of Jones's fume cremators. The temperature in the cells of the destructor is about 1,100 deg. The fumes from the cells, before reaching the chimney-stack, have to pass through the cremator, the temperature of which is 1,500 deg. The chimney-shaft into which the fumes find their way is 160 ft. in height. A mortar-mill has also been erected which grinds and converts into mortar the products left in the cells after burning. The cost of the destructor has been about 7,000*l.*

MID-KENT WATERWORKS.—These works have been constructed by a company called the Mid-Kent Water Company, Ltd., to supply water to some eleven parishes in Mid-Kent, which may be described as being situated in a triangle, with Maidstone, Sevenoaks, and Chatham at the angles, and the River Medway passing through it from south to north. The Company is protected by Acts of Parliament passed in 1888 and 1890, the latter being an extension of area which was applied for at the request of the local Sanitary Authority, and added a population of about 50 per cent. to the original district. The population of both districts in 1881 was 13,750, and for 1891 is estimated at not less than 16,500, being an increase of 20 per cent. in the decade. The cause of this large increase, which will no doubt continue, is the development of cement making along the Medway, causing in one parish an increase of 50 per cent. The supply of water for ordinary domestic and business purposes is calculated to yield a good interest on the Company's capital, but the Company is now treating with some of the cement-manufacturers and paper-makers for the supply of water in large quantities, which the Company can do at a remunerative rate to themselves and show a great saving on the present supplies of those works. The chief reason for this is that the works have wells in the chalk which deposit in the boilers an enormous quantity of carbonate of lime, whereas the Company goes through, and shuts out the chalk, into the lower green-sand formation. The late Mr. William Russ, M.Inst.C.E., and Mr. Arthur F. Bowker, C.E., F.R.G.S., were the Company's engineers, but since the death of the former in February last, the latter has carried out the works to completion, having resided in the district from the commencement, and personally superintended the works at all points, and also managed for the Company since they have started to supply. The sinking of a well into the lower green-sand was commenced in July, 1889, by Mr. Richard D. Batchelor, of Chatham, and successfully completed in the following February, the depth being 375 ft.,—140 ft. of chalk, and 210 ft. being stiff gault, the remainder being the upper green-sand between the chalk and gault, and the upper crust of the lower green-sand; the bore-hole is lined with screwed wrought-iron tubes, of 15 in. diameter right through. The pumps are 44 ft. below surface, the water rising when at rest to 25 ft. from the surface, and when at work pumping 500 gallons per minute, about 60 ft. from surface. A Pulsometer steam-pump, capable of pumping 28,000 gallons per hour, is in the well, in order to pump water out in the event of anything happening to permanent pumps. The engines, which are compound, with air-pump and surface-condenser, are in duplicate, as also the boilers and pumps; the latter are of the plunger type with 10-barrels, and work off a disc on the main shaft of engine, and can be worked with 18, 24, 30, or 34 in. stroke. The disc pins of pump connecting rod-heads are extended, so that the two pumps can be linked together if required. The reservoir is situated at Upper Halling, at 240·00, so that the works on the banks of the Medway can be supplied with water at a pressure of over 90 lbs. per square inch. It holds nearly 200,000 gallons. When the works are more fully developed it is contemplated to place a reservoir in the south of the district, 6½ miles from the pumping-station, the present being about 1¾ miles in the opposite direction. Some 10 miles of mains have been laid, and to complete the district some 12 miles more will be laid, and already about 250 houses are being supplied, besides supplies in bulk. Messrs. Calvert, Cornes, & Harris, of London, supplied the engines, boilers, pumps, and water-mains; and Mr. Young, of Skegness, built the reservoir and pumping-station, and also laid the mains.

SEWERAGE SCHEME, STAFFORD.—According to the *Birmingham Gazette*, an important report on the proposed system of sewerage has been placed in the hands of the members of the Stafford Town Council by the Public Health Committee. Mr. Blackshaw, Borough Surveyor, has prepared a scheme, the capital cost of which is estimated at 22,000*l.*, and the annual cost at 2,440*l.*, or something like a rate of 11d. in the pound. It is proposed to have precipitation-tanks at the present sanitary depôt at the Lammascotes, and to acquire forty acres of land, on to which the effluent would be pumped for filtration.

SEWAGE PURIFICATION AT NUNEATON.—Major-General C. Phipps-Carey, R.E., of the Local Government Board, held a public inquiry at the Town Hall, Nuneaton, on the 3rd inst, as to the application of the Nuneaton Local Board for a loan to improve their sewage works and carry out the ferozone and polarite process of sewage treatment of the International Water and Sewage Purification Company, of 7, Victoria-street, Westminster. Heretofore the Nuneaton sewage has been treated by the lime and alumina process. Mr. J. S. Pickering, C.E., Engineer and Surveyor to the Nuneaton Board, explained the plans proposed to be adopted. Mr. Frank Candy, Managing Director of the International Company, gave information about the system of purification intended to be carried out. At the conclusion of the inquiry the Inspector announced that he should report favourably on the proposal of the Nuneaton Local Board to carry out the International Company's system of sewage purification. Tenders have been accepted for construction of the works, which will cost much less than a sewage-farm.

WATER SUPPLY OF MANSFIELD.—The present water undertaking at Mansfield, Nottinghamshire, was purchased some time ago by the Improvement Commissioners from a company. It became necessary to provide a more adequate supply of water, and Mr. Hodson, C.E., was consulted, with the result that a new scheme is now proposed, at an estimated cost of 24,929*l.* 6s. 6d. The new source of supply is on ground belonging to Lord Savile at Rainworth, where an abundant quantity of excellent water, it is stated, has been found.

FOREIGN AND COLONIAL.

BERLIN.—The National Monument Question which has for some time not been heard much of, is coming to the front again. The site decided on by the Emperor (*i.e.*, the extension of the so-called "Schlossfreiheit" in front of the Imperial Palace) has now become the property of the organisers of the great lottery opened for the purpose of purchasing it from the several owners it belonged to last year. There seems to be some difference of opinion as to when the property is to be handed over to the keeping of the municipal authorities.——A competition has been opened to sculptors for a model of the equestrian statue of Emperor William I., to be placed in a prominent position on the otherwise mainly architectural monument to the deceased, which is to be built on the "Kyffhäuser" (architect Herr Bruno Schmitz). Four prizes are to be awarded; a jury of fifteen members will decide on the award.——The Prussian Royal Academy of Arts intends giving away the "Rohrsche" studentship to architects this year. The studentship (250*l.*) will be given for the best design for a large concert hall for Berlin, subject to certain conditions.——Whilst the International Art Exhibition is but in its second month, the "Verein Berliner Kuenstler" are already busy with the preliminary arrangements for their next year's annual Art Exhibition which they intend holding in the same building.——During May, 185,000 ordinary entrance tickets were issued at the gates of the International Art Exhibition, and some 8,000 season tickets sold. The Exhibition is open from nine a.m. till nine p.m. on week-days and Sundays. The ordinary admittance costs sixpence; on Mondays there are double prices. Season-tickets, permitting entrance on all days, cost six shillings. After dark and on dull days the Exhibition is lighted by electricity, well distributed; arc lights being used. The catalogues have not yet shown any marked improvement, and are strongly complained of in the local press.——The Government are taking energetic steps to ensure a good representation of Germany's industry at the coming Chicago show. Programmes, inquiry-sheets, and schedules are being issued in the various commercial centres.——Another of the several proposed theatres is now to be taken in hand, the authorities having accepted the plans. This new theatre, which will go by the name of the "Eden Theatre," will be situated "Unter den Linden." The design, which is by the theatre specialists, Messrs. Fellner and Hellmer, of Vienna, will be carried out under the superintendence of the Berlin architects, Messrs. Cremer & Wolffenstein.——Owing to some disquieting rumours regarding the safety of bridges on the German Government railway lines, which were being circulated in the local press in connexion with descriptions of the late bridge accident near Bâle, the Government has thought it advisable to give some information on the matter in the Imperial *Gazette*, pointing out that their system of inspection was so perfect that the public could well banish all fears.——A new scheme for an electric underground railway through the city has just been proposed, the preliminary drawings, by engineer Immeckelenberg, having been laid before the municipality for consideration.——The German Minister of Public Works, Herr von Maybach, has resigned owing to ill-health. The Emperor has expressed his great regret at the loss of so valued a servant. The successor to the post is Herr von Thielen, who has for some time held a high position in the administration.

DENMARK.—A new college has been added to the public buildings of Copenhagen. It is a three-storied structure, containing twenty-two class-rooms, and accommodation for some 600 scholars. The materials used are red bricks, sand-stone, and iron, the stairs being laid with yellow and black patterned tiles. There is a large glass-covered playground, with mosaic floor, and an open one having an area of 10,000 square ft. The architect is Herr F. L. Levy.——The architect of the so-called Marble Cathedral in Copenhagen, Professor Meldahl, upon which work has now been in progress, with several interruptions, from want of funds, for many years, states that he now expects the edifice will be finished in two to three years.——An interesting archæological work has just appeared in Copenhagen by a well-known architect and archæologist, Herr J. B. Löffler, upon the tombstones, tablets, and memorials, in the ancient church of Ringsted, where several Danish Kings and Queens, statesmen, noblemen, prelates, &c., of the Middle Age are buried. It is accompanied by fifteen plates, and is of great value to the student of Danish archæology. Professor Löffler has previously issued similar works upon the memorials in two other ancient churches in Denmark.

SWEDEN.—The authorities of the City of Stockholm have contracted with Messrs. Siemens & Halske, the well-known Berlin electricians, for the erection of the great new central electric station in the Swedish capital.——An exhibition is now taking place in Stockholm of the numerous heating and ventilating apparatus invented by Herr E. A. Wimaus, engineer. Houses in Sweden leave a great deal to be desired in these points.——Two valuable quarries of black granite at Gyllsboda have been sold to a German firm, considerable exports of stone already taking place.——Arrangements are being made by the Swedish-Norwegian consul in Sydney, Herr C. A. Falstedt, for the establishment of a sample office of Scandinavian manufactures in that town, with a view to introduce them in the Australian markets.——The town council of Gefle has voted a sum of 38,000*l.* towards the construction of a new harbour, &c., in this city.——Apropos of the drying of new houses by fire, the Stockholm Building Board has issued some stringent regulations. The work must only be effected by competent persons, with hose and water in readiness. Detached stoves for drying must only be used on the condition that the stove is fitted with iron supporters and rests on a solid brick foundation, and stands in a box of sheet iron with sides at least 30 centimètres in height, surrounding the stove at a distance of at least 0·5 centimètres; and that no such work must be undertaken before due notice is given to the police.

NORWAY.—A movement is on foot among Norwegian painters, sculptors, &c., for raising funds towards the establishment in Christiania of an exhibition gallery of their own. All leading Norwegian and Swedish artists have presented works to be sold towards the realisation of the scheme, now exhibited in the capital.——The building of a new customs house in Christiania will shortly be commenced, the plans accepted being those of Herr Schirmer, official inspector of buildings, and a prominent Norwegian architect.——The work of restoring the venerable Throndhjem Cathedral has so far progressed that the eastern chancel has been taken into use for religious service, after some 700 years of discontinuation. The pulpit, seats, &c., are of oak, in Mediæval style. The leading press organs urge upon the public to treat the edifice with care, the sandstone and marble used being easily

damaged and stained. One local journal advocates the building of a city church for worship, so that the ancient edifice may be preserved solely as a national architectural memorial.

HELIGOLAND.—A fountain is to be erected on the cliff to commemorate the day on which the island came into German hands. Herr von Nechtritz, of Berlin, has executed the model for the fountain. The central feature of the work is the figure of a girl resting on some rocks, three children playing at her feet; the whole standing on a high cylindrical pedestal, which is ornamented with a medallion with a relief portrait of the Emperor.

WARSAW.—Thirty-one designs have been sent in for the "international" competition for designs for the proposed terminus station to the Vienne-Warsaw Railroad. The jury elected to decide on the competition consists of two directors of the railway company, three engineers, and four architects. The result will be made known in July.

MISCELLANEOUS.

ELECTION OF A NEW ROYAL ACADEMICIAN.—At a general assembly of Academicians, held on the 23rd inst., at the Royal Academy, Mr. Frank Dicksee, painter, was elected an Academician.

IMPROVEMENTS AT NEW MALDEN.—Mr. Thomas Codrington, M. Inst. C.E., an Inspector of the Local Government Board, on the 12th inst. held an inquiry at the New Malden Local Board Offices on the subject of the Local Board's application for permission to borrow 2,000*l.* for about six miles of kerbing to the footpaths. Mr. T. V. Herbert Davison, M. Inst. C.E., the Engineer and Surveyor, explained the plans and specifications.

MECHANICAL STRESS ON STEEL.—The result of investigations made by Mr. Carus Wilson on the effect of mechanical stress on steel, recently published, shows that, in the case of uniform longitudinal strain on a steel bar, there is a strain of the molecules, also of the elements, and a production of flow by a strain of the elements. The elongation due to flow is, he says, the strain usually observed, and this may be either recoverable or otherwise; again, the strain of an element is made up of a uniform dilatation and a uniform shear about an axis parallel to that of the bar, and, therefore, the flow elongation consists of an increase of volume, together with a certain amount of sliding. The general conclusions arrived at by the author of these experiments are as follows:—Mechanical strain produces an atomic disturbance in a bar, and this disturbance increases regularly with the stress; for small stresses the disturbance is only partly permanent, but as the yield point is approached it becomes wholly permanent; finally, the magnetic properties of a loaded bar are in general different from those of the same bar unloaded; but, notwithstanding this general fact, there is a certain stress, or range of stresses, over which the bar is found to have the same magnetic properties, whether it be loaded or not.—*Iron.*

PUBLIC FOUNTAIN, ALNWICK.—On the 8th inst. a new fountain, presented by Alderman Adam Robertson to the town of Alnwick, was opened by Lord Percy. The style of the fountain is a phase of Italian Renaissance. The base consists of a horse-trough in front and drinking-fountains at the sides, having above a canopied jet. The lower base is square, with the horse-trough projecting from the front. A granite panel, containing an inscription, occupies the front of the upper portion of the base. The eight granite columns which encircle the jet carry an arcade with carved keystones and spandrels, the frieze over the arcade having alternate flutings and rosettes. The cornice contains two enriched members, and the dome which crowns the edifice is panelled on every face. The height of the structure is 25 ft. The freestone employed is from Denwick quarries, and the granite is red Peterhead. The fountain has been erected from the designs and under the superintendence of Mr. George Reavell, jun., architect, of Alnwick, by Messrs. Green & Douglas, of Amble. The arrangement of the water supplies has been planned by Mr. Geoffrey Wilson, Town Surveyor, and executed by Messrs. T. H. Hindmarsh & Son.

SCREEN, STAVERTON CHURCH, DEVONSHIRE.—The re-dedication of the restored screen of Staverton parish church took place on the 9th inst. Rather more than two years ago the screen was taken down bit by bit and numbered, and the work of renovation and reconstruction has been going on ever since. The screen now stands much on the same lines that it did originally. The fabric stretches across the two aisles and the nave,—a space of rather over 50 ft.,—and where, in its lower parts, it cuts into the octagonal columns of the arcades, the stonework is cased up with oak framed and traceried panelling. The oak cill is new, and is moulded with projecting bases, upon which rest the company of eighteen upright posts that separate the seventeen bays that go to make up the length of the screen. Three of these bays form carved doors. From the cill to the transom,—a height of 3 ft. 6 in.,—is carved tracery work, and over this the moulded and carved uprights are carried up to take and carry the groined work, each divided by three mullions, and crowned in its arched head by pierced tracery. The groining overhangs on both the eastern and western faces of the screen, giving a width of 6 ft. 9 in. This forms the floor of the gallery, and runs across the church. Above the groining are five bands of carving, occupying the length of the gallery. Above this, and rising some 15 ft. or more from the body of the church, are the gallery fronts. The front facing next is divided into a series of canopied niches,—nine in all,—that occur at regular intervals the whole length of the screen, the one over the central doorway being a triple one. They are divided from each other by moulded buttresses terminating in double pinnacles. Above is a cornice, all being surmounted by an ornamental cresting. The architect was Mr. F. Bligh Bond, of Bristol, and the work has been carried out by Mr. Harry Hems, of Exeter.

HANLEY.—A new park is to be laid out for the Corporation of Hanley. Mr. T. H. Mawson, of Windermere, has been commissioned to superintend the work.

TELEPHONIC COMMUNICATION BETWEEN SWEDEN AND NORWAY.—The Swedish and Norwegian Parliaments have voted a sum of 3,700*l.* each for the purpose of connecting the telephonic systems of the two countries, when Stockholm and Christiania will be in direct touch.

REMOVAL.—Messrs. W. H. Barber & Son inform us that they have removed their offices from No. 12 to No. 22, Buckingham-street.

THE NEW OAK LECTERN FOR ST. PAUL'S CHURCH, DEVONPORT, has been executed by Rashleigh Pinwill & Co., of Plymouth, from the design of Mr. Edmund Sedding.

FAWCETT'S VENTILATED FIREPROOF CONSTRUCTION COMPANY (LIMITED).—A company has been formed, with a capital of 20,000*l.*, for the purpose of developing Messrs. Mark Fawcett & Co.'s United States patent for fireproof flooring. No shares will be offered to the public, the whole of the first issue having been applied for by the friends of the partners.

ASSISTANT-SURVEYORSHIP, CAMBRIDGE.—At the last meeting of the Cambridge Town Council, the salary of Mr. A. C. James, Assistant to the Borough Engineer and Surveyor, was increased by 26*l.* per annum.

OLD WATER-PIPES, EDINBURGH.—The workmen engaged in excavating at George-street, Edinburgh, in order to lay new gas-pipes, have removed some pieces of the old wooden water-pipes. They measure altogether about 7 ft. in length, and are otherwise of the same dimensions and form as a piece removed a few days previously at the extreme west end of the street. They were lying just at the junction of South Castle-street with George-street, and are in good condition considering their age. With them was unearthed a couple of the iron rings with which, as before described, the pieces were held together. These rings are on one side sharp, and the joining, it seems, was effected by driving the sharp edge of the ring into the thick end of one piece of the pipe, while it encircled the narrow end or neck of the other or inserted piece. So far as the workmen have gone, they have ascertained that about 60 ft. of wooden pipe still remain embedded. The pieces which have been cut away were those interfering with the proper laying of the gas-pipes. *Scotsman.*]

EXTENSION OF THE MERSEY RAILWAY TO ROCK FERRY.—On the 15th inst. the extension of the Mersey Railway to Rock Ferry, Cheshire, was opened for public traffic. After leaving Green-lane Station, the Mersey Railway rises by a steep gradient to the level of the Chester and Birkenhead line of the London and North-Western and Great Western Joint Railways at the Union-street Junction, on the Freehold, Lower Tranmere. From this point up to Rock Ferry the original railway embankment of the Birkenhead and Chester line has been widened by means of heavy retaining walls; and the masonry bridges over Union-street and St. Paul's-road have been removed and replaced with wrought-iron girder bridges of sufficient width to receive the additional line of rails, while at the same time the streets under the bridges have been widened. The existing junction at Union-street has been taken out, and the Mersey Railway extended, on the widened embankment alongside of the joint railway, to Rock Ferry, where a new junction and station have been formed. At the new station there is a long platform on each side of the main line, and also a dock with two platforms for the arrival and departure of the Mersey Railway Company's trains. The platforms are paved with granolithic flags, and for the greater part of their length are covered by roofing, consisting of wrought-iron columns and principals, with zinc and glass covering, and are provided with waiting-room accommodation, inspectors' and porters' rooms, &c. Communication between the platforms is effected by means of a covered footbridge, carried by wrought-iron braced girders on cast-iron columns. The booking hall, with ticket office, parcel and left luggage office, &c., is on the level of Bedford-road, and through this building is the main entrance to and exit from the station, covered staircases leading to each of the various platforms. The whole of the buildings are faced with red Ruabon brick, the stonework being of red sandstone from Helsby. The interior of the booking hall, staircases, &c., is lined with enamelled bricks, the upper portion in light cream, and the lower portion forming a dado in brown. The open roof over the booking hall and all the joiners' work in it are of varnished pitch-pine. Mr. R. E. Johnson, of the London and North-Western and Great Western Joint Railways, was the designing engineer for the work, and Mr. W. Alexander the resident engineer. The contractors for the retaining walls and bridges were Messrs. Wilson & Sons, of Marsden, near Huddersfield. Messrs. T. & W. Meadows, of Heaton Norris, Stockport, are the contractors for the new station, which will bring the Mersey Railway into direct communication with the Birkenhead Joint Companies' lines.

BOYLE'S SYSTEM OF VENTILATION IN SOUTH AFRICA.—Mr. Robert Boyle, of Messrs. Robert Boyle & Son, Limited, Ventilating Engineers, London and Glasgow, has just returned from a tour through South Africa, made with the object of stirring up an interest in sanitary matters, and with the view of introducing the Company's sanitary appliances. As the result of his efforts we learn that several of the leading merchants who have been appointed agents in South Africa have purchased stocks of the air-pump ventilator and other appliances manufactured by Messrs. Boyle, to the value of, in Africa, over 4,000*l.*, also guaranteeing to sell not less than double that amount each year for five years. On his outward journey Mr. Boyle visited Lisbon, where important ventilating contracts on the Boyle system are pending for military barracks and other government buildings. At Cape Town the air-pump ventilators are used at the Houses of Parliament, the Castle, Town-hall, New Somerset Hospital, and old and new barracks. They have also been adopted for the new theatre, new military prison, and several churches, schools, and other buildings. Plans have been submitted for the ventilation of the new system of drainage which it is proposed to introduce at Cape Town. At Kimberley the Boyle system of ventilation has been applied to, amongst other buildings, the High Court House, new government buildings, new stock exchange, Kimberley Club, and the Diamond Fields Club. The new stock exchange, theatre, pavilion, and club-house, Johannesburg, are ventilated with the Boyle system, which is adopted for the new club, hospital, and court-house, Pretoria. Plans have also been submitted for the ventilation of the new Houses of Parliament in that town. The system is also going to be applied at Pietermaritzburg to the new town-hall, municipal buildings, and new railway-station, the House of Parliament and the barracks being already fitted with it. At Durban the town-hall and municipal buildings, and the Masonic-hall, are ventilated with the air-pump ventilators, they being likewise adopted for the new railway-station, the hospital, and other buildings. The Boyle system of ventilation is in use at St. Andrew's College and the asylum, Grahamstown, and is adopted for the ventilation of the cathedral. It is also specified for the new theatre and opera-house, the hospital, and new schools, Port Elizabeth, and plans have been submitted for the ventilation of the Town-hall, municipal buildings, and the drainage system.

LEGAL.

ARCHITECT'S CLAIM FOR COMMISSION

CUTLER *v.* NORTH.

THIS remarkable case was tried in the Queen's Bench Division before Lord Chief Justice Coleridge and a special jury. The hearing commenced on Friday, the 19th inst., was continued on Monday last, and concluded on Tuesday. The plaintiff was Mr. Thomas William Cutler, F.R.I.B.A., and the defendant was Colonel North, the so-called "Nitrate King." It arose out of the building, or rather the enlargement, of Colonel North's house at Avery Hill, Eltham. The plaintiff claimed to recover the sum of 2,718*l.*, the balance of his account for 5,468*l.*, the defence being in substance that the expenditure had been grossly under-estimated by the plaintiff, which the latter denied. The account was as follows:—

"October, 1888, to October, 1890, preparing sketch plans and designs for additions and alterations to Avery-hill, Eltham, Kent. Obtaining schedule and prices for works from builders, accepting their estimates, January, 1889. Preparing contract drawings and specifications for mansion, picture gallery, winter garden, conservatory, orchard house, vinery, stables, &c., lodges, &c. Special designs and full-size detail drawings for decorative work, &c (over 1,000 drawings), making contracts, superintending works, &c. Total amount of measured work ascertained by Mr. Hardcastle, the surveyor, 79,255*l.*; lodges, 1,997*l.*; boundary walls, 872*l.*—82,126*l.*; deduct decorative work included in above, 10,000*l.*—72,126*l.*; other contracts, 27,270*l.*—99,396*l.*; commission as per agreement on that amount for building, 2,485*l.*; on 35,451*l.* for decorations, 2,668*l.*; extra expenses, 200*l.*—5,343*l.*"

According to the case for the plaintiff, he was to have 2½ per cent. on the cost of building and 7½ per cent. on the decorative part, and a memorandum to that effect had been signed by the two parties, as will be seen. The defence (originally delivered in December last) was that the total cost was to be 65,000*l.*, but that the plaintiff so negligently and unskilfully made the plans, &c., that the cost largely exceeded that sum, and amounted to above 100,000*l.* [It was also pleaded that on

March 19 the plaintiff ceased to be the architect, and that at that time work to the amount of only 54,300*l.* had been executed, and that commission was only due on that; but this defence depended upon the main defence set up.]

The defendant being called upon to give particulars of his defence, gave these,—that the plaintiff was instructed to prepare plans, &c., of works which were not to exceed in cost the sum of 65,000*l.*, or thereabouts, and that the cost had amounted to 100,000*l.* and upwards. Further particulars being required, he gave these:—

"The agreement was verbal and made at Eltham. Before the defendant's departure for Chili in February, 1889, the plaintiff verbally stated that the sum of 40,000*l.* would cover the cost, and upon the faith of that statement the original order was given by defendant. On his return from Chili in July, 1889, he, being dissatisfied with the amount already expended, again had an interview with the defendant, who stated that 65,000*l.* should and would cover the cost of the works, and on the faith thereof he permitted the execution of the works to proceed."

Upon these materials the case came on for trial.

Mr. M'Call, Q.C., and Mr. Radcliffe appeared for the plaintiff; and Mr. Reid, Q.C., Mr. English Harrison, and Mr. Spencer for the defendant.

The plaintiff had been employed as architect at the Italian Exhibition, and had there become acquainted with the defendant, who, in September, 1888, informed him of his intention to enlarge his house, and desired him to set to work on the matter at once to prepare plans, &c., and two or three sketch plans were prepared. According to the case for the plaintiff no limit was put as to expense on these mere sketch plans, though at first he might have told the defendant that the works at that time contemplated might cost about 40,000*l.* Full plans, however, were afterwards with schedules of prices, &c., prepared, and in the early part of February a contract was signed by which it was agreed that the plaintiff's remuneration should be at the rate of 7½ per cent. on the amount spent on decorative work, and 5 per cent. on the structural; half of the latter amount to be handed over to a Mr. John Oliver Cooke, who was to be assistant architect in the work. The plaintiff gave evidence to the effect that he all along pointed out to the defendant how unsatisfactory it would be to enter on a work of this magnitude without the necessary contracts, specifications, quantities, drawings, &c., being prepared, but the defendant insisted that operations should be commenced immediately before his departure for Chili, which would be in February. The plaintiff denied, however, that at that time, when only sketch plans were prepared, he had given any definite estimate. The work was accordingly begun, and in that month the defendant left England, and did not return till the end of the following July, when operations were in full progress, proper plans having, in the meantime, been prepared. The plaintiff then prepared contracts himself, which he did to the extent of some 85,000*l.* According to agreement, the work when done was to be measured and valued, under the contract with Mr. Chappell, the builder, on behalf of both parties, by Mr. F. H. A. Hardcastle. The builder accepted the result, and it was on the basis of this measurement that the plaintiff now claimed commission. There was considerable disagreement between the plaintiff and defendant as to the expense incurred, and in the result came this action and defence. The defendant's account of the matter now was that the plaintiff undertook definitely that the proposed alterations should not cost more than 30,000*l.*; that in February this estimate was increased to 40,000*l.*, and that he positively told the plaintiff that this limit must not be exceeded; that on his return to England in July he discovered that more than this had already been spent, and that the house was still very far from completion; that the plaintiff then undertook that 65,000*l.* should cover everything, whereas in the end the plaintiff had entered into contracts with builders, decorators, and others to the amount of 115,000*l.* This, the defendant contended, he had no authority to do, and, further, that he had been guilty of negligence in originally giving an estimate which he knew must be far exceeded. It was not denied that in the result the defendant had acquired a most luxurious mansion, with marble staircases, picture galleries, sculpture galleries, winter garden, and every possible convenience, and it was stated that the work had been well done; but it was insisted that the plaintiff, as architect, had failed in his duty in allowing the estimates to be so enormously exceeded, and that he was not entitled to recover commission beyond the amount expended when he was suspended, or, at all events, not beyond the amount he had estimated.

The defendant, in cross-examination, stated that since Mr. Cutler was dismissed, 30,000*l.* had been expended on the building. He dismissed him, he said, on the report of Mr. Budd, his solicitor; but when asked if he had read it he did not think he had. Being shown it, he looked at it, and said he did not think he had seen it before; he had not read it. Asked if his attention had been called to this—that the plaintiff's charges were calculated by Mr. Budd on an expenditure, not of 65,000*l.*, but of 104,000*l.*,—he said it was not. He was reminded of an interview between himself and Mr. Cutler on Jan. 16, 1889, and he admitted that he agreed with him on the commission, and that was what the "commission note" of February 1 related to.

The note was read, from plaintiff to defendant:—

"Dear Colonel North,—I beg to confirm our conversation and agreement respecting my professional engagement as your architect for the additions and alterations at Avery-hill. My commission to be 7½ per cent. on the total amount expended for decorative work, and 5 per cent. for ordinary building. It is understood that I divide my 5 per cent. commission with Mr. J. O. Cooke who is to act with me as assistant architect, you paying him 2½ per cent. and me 2½, and I am to retain the whole of my 7½ per cent. commission for the decorative work."

"Accepted, John T. North."

Colonel North, being asked how it was that the amount of 65,000*l.* was not mentioned in the memorandum, nor the sums of 40,000*l.* and 35,000*l.*, said they had not been mentioned at that time. His attention was then directed to the letter from Mr. Budd to Mr. J. O. Cooke, to the effect that Colonel North must pay unless he could show that the agreement had not been made *bond-fide*, but with stipulations by the plaintiff for commission, &c., from contractors; and he was asked if he had made that suggestion of illicit commission, and he denied it, and, being asked who else could have made it, he said he supposed the solicitor. His attention was directed to the correspondence in March and April, 1890. Mr. Cutler had, he said, written for a cheque for 1,500*l.* on account of his charges, having then received between 3,000*l.* and 4,000*l.* Taking the lowest of these sums, therefore, the plaintiff was then asking for 3,500*l.*

For the defendant, Mr. Rokeby Cooke, steward to Colonel North (and brother of Mr. John Oliver Cooke), Miss Emma North (a daughter of the defendant), Mr. Gamble North (his brother), Mr. R. H. Fowler (a friend of the defendant), Captain Carvick (defendant's sporting secretary), Mr. Budd (the defendant's solicitor), Mr. John Oliver Cooke, the assistant architect; Mr. Charles Barry, and Mr. T. Chatfeild Clarke, were called. The first five of these witnesses deposed with more or less vagueness and variety as to having heard the plaintiff say that the house would only cost 30,000*l.*, or "about 30,000*l.*," 40,000*l.*, or 65,000*l.*

Mr. John Oliver Cooke, the architect who was associated with the plaintiff in the execution of the works, and who succeded him when he was dismissed, said that Colonel North only authorised (verbally) expenditure to the extent of 40,000*l.* That was at Euston-station at the door of a railway-carriage. Cross-examined by Mr. McCall, he admitted that he regarded that limitation as important, and that both he and Mr. Cutler were bound by it. Nevertheless, he went on signing certificates for payment to the builder long after that amount had been exceeded, and when he saw that 40,000*l.* was likely to be only about one-third of the total expenditure. He took no step to inform Colonel North of that. The contract with the builder was for no particular amount: it was for "measure and value."

Cross-examination continued.—Were you afraid to communicate with Colonel North?—(After a pause).—No. Now, do you recognise that your share of commission is to be limited to 40,000*l.*?—No; it goes on to 65,000*l.* Do you recognise that it is limited to 65,000*l.*?—Yes. Have you sent in any claim?—No; but I have received payments. Did you tell Colonel North when you saw him in July that the expenditure would be 120,000*l.*?—No, I did not. I thought Mr. Cutler was the proper person to tell him. I don't think I ever told him. Now, at this time, up to September, 1889, you were corresponding in friendly terms with Mr. Cutler?—Yes. But at that time, according to you, he was involving Colonel North in this enormous expenditure beyond what he intended?—It was not for me.

Lord Coleridge: But, you see, you were to get 2½ per cent. with him upon the amount, and you were writing to him in friendly terms, though aware that he was going to an enormous amount beyond what Colonel North contemplated? That is what requires explanation.

Mr. M'Call: Can you explain it?—No. In further cross-examination, the witness said he "kept in his head" a list of the errors or mistakes Mr. Cutler made. When he quarrelled with him he put them on paper to show to Colonel North. He did not think that such conduct was unprofessional and unfair. He admitted that the total "errors" which had been made by Mr. Cutler only amounted to less than 500*l.* out of the enormous aggregate outlay.

Mr. Budd, the defendant's solicitor, denied that he had ever heard any mention of the 30,000*l.* limit until he heard it mentioned in court. As to the suggestion about illicit commissions referred to in his letter to Mr. J. O. Cooke, already mentioned, he did not think it came from the defendant, but it must have come from somewhere,—possibly from Mr. J. O. Cooke himself.

The Lord Chief Justice said that it no doubt came from the *Fidus Achates* (Mr. J. O. Cooke).

Mr. Charles Barry, F.R.I.B.A., and Mr. T. Chatfeild Clarke, F.R.I.B.A., both stated that from an examination of the sketch-plans, they should estimate the approximate cost of the buildings at 30,000*l.* They could not conceive of any architect of experience naming any such sum as 30,000*l.*, or even 40,000*l.*, provided he exercised ordinary care. Mr. Barry said that the plans could have been cubed up in an afternoon.

Counsel on both sides having addressed the jury,

The Lord Chief Justice summed up. It was, he said, a curious thing that, whereas most of this class of cases turned upon the good or bad execution of the work done, it was here admitted that, large as the sums might be which had been expended, the defendant had got money's worth for his money, and that the work had been "excellently well done." The position of the parties, therefore, was peculiar. According to the contract made between them as to the commission, the claim appeared to be undefended. The defendant, Colonel North, however, set up a counter-claim for damage caused to him by the alleged negligence of the plaintiff as his architect, resulting in excessive and unnecessary expenditure,—a good defence, no doubt, in point of law, if made out. It was not, indeed, said that his work as an architect had been badly or negligently done, and it was admitted that Colonel North had got a magnificent residence for his expenditure. But the defence set up was that the architect had undertaken that the expense should be within a certain sum, and that it had been greatly exceeded. Now, he very much doubted whether this defence came under the head of negligence; but he would leave it to the jury, and would leave to them these two questions—(1) Was any such guarantee of the amount of expense given by the plaintiff? (2) If so, had it led the defendant into an excessive expenditure? For the purposes of the trial he would direct them that if they found these questions in the affirmative they should find for the defendant; if in the negative, for the plaintiff. Now, this was certainly a most remarkable case, for no one knew of the defence set up to-day until a few weeks ago. The original defence went upon a supposed estimate of 65,000*l.* Within the last two months the plaintiff was told of supposed estimates of 40,000*l.* and 30,000*l.*, and in the course of a long correspondence between the parties it was not suggested that the sum of 30,000*l.*, or 40,000*l.*, or 65,000*l.* was ever mentioned. At this trial, Colonel North and his witnesses had spoken of an estimate of 30,000*l.* If the fact had been so, how was it that it had never been heard of before? This, surely, was a very singular and remarkable fact that not one of these alleged estimates of expense was to be found in writing. [Mr. English Harrison.—The sum of 65,000*l.* is mentioned in the pleadings.] Just so; that is what I have stated. It is mentioned in the pleadings; neither that nor any other sum is to be found in the correspondence, nor anywhere in writing before the action. That is the point I put to the jury. Now, Colonel North, who was called in support of his defence, appeared to be a person of a strong will, and, being about to go to Chili, he was very anxious to have the work commenced before he left. The plaintiff stated that he was asked in October, 1889, to make plans for a large house with plenty of rooms, and there was no limit as to expense. He made the ground plan, and, being asked what he supposed would be the expense, answered roughly about 40,000*l.*, but that he could not really calculate without full plans and contracts and specifications. Colonel North pressed him to commence without specifications or contracts. The architect "was to begin and make the drawings how he could." "He would have it begun," he said, "before he went." He had no right afterwards to turn round upon his architect—who had told him at the time that he could not have a definite estimate without full plans and proper working drawings and specifications, which there was not time to prepare before he went away. Having analysed the evidence, commenting in scathing terms upon the utterly unfounded insinuation that the plaintiff had received illicit commissions from a sub-contractor or sub-contractors, the Judge left the case to the jury.

After an absence of only three minutes the jury returned into court with a verdict for the plaintiff for the full amount claimed, with interest at 5 per cent.

Lord Coleridge gave judgment accordingly.

Mr. English Harrison, for the defendant, applied for a stay of execution on the usual terms of bringing the money into Court in order to enable him to move.

Lord Coleridge: On what ground?

Mr. Harrison: To review the verdict of the jury.

Lord Coleridge said he entirely and absolutely agreed with the verdict, and he declined to accede to the application. He would certify for a special jury.

CAPITAL AND LABOUR.

THE LOCK-OUT OF LONDON CARPENTERS AND JOINERS.—There is practically no change in the situation, the firms struck against having a large number of men at work, in spite of the activity of the pickets, and the attitude of the masters appears to be as strong and united as ever. A statement has been made in the papers that "at the masters' meeting which was held on the 18th inst., a proposal that the men should work fifty hours at 10*d.* per hour was lost by only three votes." We are informed that this, like many other reports made during the present struggle, is absolutely unfounded; no such meeting has been held, and no such absurd proposition mooted.

CONTRACTS AND PUBLIC APPOINTMENTS.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Sawering and Making up Roads, &c.	Hendon Loc. Bd.	S. S. Grimley	June 29
Buildings, Wester Rhiries, Knockando, N.B.	Cameron & Allan	.....	June 30
Cottage and Additions to Maltings, Distillery, Glenburghie, Elgin	.....	C. C. Doig	do.
Stone Bridge, Road, &c. Pontsarn	Dynaspowis High. Bd.	E. R. Lewis	do.
New Road, Rhiw-sir-David	Mynyddislwyn L. B.	Seth Phillips	do.
Fifty Workmen's Cottages, Elsen-Llynvi, near Maesteg	North's Navigation Collieries, 1889 (Ltd.)	.....	do.
School, West Stanley, Durham	Tanfield Sch. Bd.	J. W. Rounthwaite	do.
Cottage, and alterations to Buildings, Broadmoor, Petersfield	P. C. C. Radcliffe	.....	do.
Three Warehouses, Brunswick-street and James-street South, Belfast	John Lepper	Vincent Craig	do.
Engine Shed, Belfast Terminus	Belfast and Northern Counties Ry. Co.	*Official*	do.
	Southwark Vestry	do.	do.
*Asphalte Paving	.....	.....	.....
New Hall and Assembly Rooms, Kenilworthy	.....	J. K. Freeman	do.
Additions to School, Ballmartin, Tiree, N.B.	Alex. McLean	.....	do.
Cast-iron Water-pipes and other Castings (100 tons)	Nelson (Yorke) Corp.	J. Newton & Son	do.
Villa Residence, Wylam, Northumberland	Jas. Gibson	Davidson & Bendle	July 1
New Class-room to School, Garnduffaith	Trevethin Sch. Bd.	E. A. Lansdowne	do.
House, Whitley, Newcastle-on-Tyne	J. J. Carr	Henry Gibson	do.
Branch Stores, House, and Two Cottages, Begarrington	Queensbury Indus. Soc	Herbert Hodgson	do.
Baltic Red Wood Sleepers (300,000)	G. W. R. Co.	*Official*	do.
Workhouse Hospital	North Dublin Union	do.	do.
Fire Station, Newton Heath	Manchester Corp.	do.	do.
Culverts, Thorneley Burn, and Rowlands Gill	Blaydon Loc. Bd.	Michael Hawdon	July 2
Sewerage Works	do.	do.	do.
*Portland Cement, Paving, Kerbing, &c.	St. Ives (Hunts) T. C.	*Official*	do.
Alterations to Workhouse	Dorking Union	Bargman & Benison	do.
Stone and Wood Erections, Hotwells	Bristol U.S.A.	F. Fashmead	do.
Iron Post and Rail Fence, Victoria-park, Windmill-hill	do.	do.	do.
Dispensary and Residence	South Dublin Union Guardians	*Official*	do.
Steel and Iron Girders	Indian Midland Ry.	do.	do.
*Scavenging, Dusting, and Watering	Bethnal Green Vestry	F. W. Barratt	do.
Drainage of Penycae District	Marg-in (Port Talbot) L. B.	*Official*	do.
*Underground Urinals	Com. of Sewers	do.	July 3
Stoading of Offices, Gordonstown, Westerfolds, N.B.	.....	A. & W. Reid	do
Additions and Alterations to House of the Fans, near Elgin	.....	do.	do.
*Painting and other Works, Bath, Bristol, &c. &c.	Midland Railway	*Official*	do.
*Alterations and Additions to Laundry	Dartford Union	Henry Rix Trott	do.
*Cottages at Richton and Wolton Temporary Offices at Smethell	M. R. Co.	*Official*	do.
Tool Works, Offices, and Chimney	.....	Jas. Farrar	do.
Infirmary Block	Fife & Kinross Asylum	Kinnear & Peddie	July 4
*Re-erection of Two Recreation Rooms, Darenth	Metropolitan Asylums Board	A. & C. Harston	do.
*Inner Lining to existing Gasholder Tank	Sheffield U. Gas Light Co.	F. W. Stevenson	July 6
3,000 Galvanised Iron Dust Pails	Limehouse S. of W.	*Official*	do.
Fiscring, &c. at Causeway, Whitwood Mere	Whitwood (Leeds) Local Board	J. Thornton	do.
Sewerage Works, Dearne Valley	Barnsley T. C.	J. B. Taylor	do.
*Rail Works	Rotherithe Vestry	E. Thomas	July 7
Addition to School, Tinkermuir, Elgin	.....	A. & W. Reid	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Painting and other Work	Chelsea Guardians	A. & C. Harston	July 7
*Roadmaking Works	Tottenham L.B.	J. E. Worth	do.
Iron Plates for Wagon Floors	India Office	*Official*	do.
*Supply of Wood Paving Blocks and Paving Bricks	Bath U.S.A	do.	July 8
Iron Shed (area 17,890 sq. yds.) Royal Dock, Great Grimsby	Manchr. Sheff. & Linc. Railway Co.	do.	July 9
Thirty Workmen's houses, Cwmanan, Aberdare	Building Club	J. W. Jones	do.
*Brick and Pipe Sewers	Smethwick Local Bd.	Harris & Harris	July 10
Heating Chapel and Schoolrooms	Trinity Chapel, Walsall	*Official*	do.
*Public Baths, Ipswich	Bath Committee	T. W Cotman	July 11
*New Church, Exmouth	St. Andrew's Church Building Committee	Paul & Cogswell	do.
Bank Premises, Newquay, Cornwall	Bolitho & Co. Lim.	H. J. Snell	do.
Alterations to Premises, Fowey, Cornwall	do.	do.	do.
*Heating Chapel and School Room	West-st. Chapel, Bourne	Mr. Shilcock	July 13
*Road Metals, &c.	Rochester Corpn.	*Official*	July 14
Iron Roofing, Steelwork, &c.	India Office	do.	do.
*New Boiler House, Setting Boilers, &c.	Isle of Thanet Guardns	Adams & Son	July 15
New Lunatic Wards, &c.	Fulham Union	H. Saxon Snell	July 16
*New Station Buildings at Leytonstone and Stratford Market	G. E. R. Co.	*Official*	do.
*Public Library	St. Margaret & St. John, Westminster. Commr. for Public Libraries	T. J. Smith	July 20
*Public Baths	St. Margaret & St. John, Westminster. Commr. for Public Baths	do.	do
*New Vicarage, House, and Offices, near Spalding	The Committee	.....	July 22
Kerbing and Channelling, Selby	Daniel Walker	.....	No date
Alteration of Premises, Womanby-street, Cardiff	W. C. Hurley	A. C. Hurley	do.
School Buildings, Marston, Northwich	Managers	M. K. Ellerton	do.
Alterations, &c. to Chapel, Easington-lane, Durham	.....	John Stephenson	do.
Terrace House, Woodsley-road, Leeds	J. S. Hodgson	Swale & Mitchell	do.
Shops and Offices, Russell-street, South Shields	W. T. Hall	Oliver & Leeson	do
New Premises, Shiremoor, Northumberland	Shiremoor Co-op. Soc.	Davidson & Bendle	do.
Mission Chapel, Hamsterley, Medomsley, Newcastle-on-Tyne	.....	Hick & Charlewood	do
Iron Columns and Girders for Warehouse, Newcastle-on-Tyne	Co-op. Wholesale Soc. Lim	Oliver & Leeson	do.
House and Shop, Seaton, Durham	D. Kenny McAvoy	.....	do.
*Alterations, &c. to "The Fire," South Norwood Hill	.....	T. Cooper	do.
Chapel, Newton Heath, Manchester	William Haddacks	.....	do.
Extension of Pier, Isle of Cauna, N.B.	.....	Niven & Haddin	do
*Alterations, &c. to Working Men's Club, Hackney	The Committee	W. Batten	do

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Clerk of Works	Stockton-on-Tees Corp.	Not stated.	July 6
*Engineer and Electrician	St. Pancras Vestry	250*l.*	July 6
*Surveyor	Herne Bay Local Bd.	130*l.* increasing to 150*l.*	July 8

Those marked with an Asterisk (*) are advertised in this Number. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xx.

MEETINGS.

SATURDAY, JUNE 27.

Incorporated Association of Municipal and County Engineers.—Annual Meeting in London (continued). Visits to the Tower Bridge, Deptford Abattoirs, Electric Supply Corporation Works, Deptford, and The Outfall Works at Crossness.

St. Paul's Ecclesiological Society Visit to the churches of Beddington and Carshalton.

Guild and School of Handicraft.—Third Anniversary. 3 p.m.

Liverpool Engineering Society.—Summer Excursion to the Thirlmere Aqueduct.

Glasgow Architectural Association.—Visit to Bothwell Castle.

TUESDAY, JUNE 30.

University College (London).—Conversazione. 8 30 p.m.

THURSDAY, JULY 2

Civil and Mechanical Engineers' Society.—Visit to the Tower Bridge.

Royal Archæological Institute.—(1.) Mrs. Ware on "The Episcopal Seals of Carlisle." (2.) Mr. F. C. J. Spurrell on "Rude Implements from the North Downs." 1 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

7,051.—VENTILATING CHIMNEY-TOPS: *W. & B. Furnival.*—The body of the pipe, either square or round, is, according to this invention, fitted with an elbow-pipe rising above it. The elbow-pipe supplies air in such a manner as to accelerate the draught and carry off all smoke or foul air.

9,524.—BRICK-MAKING MACHINERY: *Walton.*—The improvements which are the subject of this patent are directed to a better provision for giving a direct vertical lift to the bottom ram, and providing a more direct delivery in bricking machinery.

10,959.—SECURING TILES, &C., TO BACKINGS: *G. Pearson.*—According to this invention, a countersunk, hole is formed in the back of the tile, round which is disposed an ornamental device, and a flat board is then used for the attachment of the tile or panel by a screw, the head of which is tapped for the reception of a screw, pin or stud, the head of which is embedded in glass, pottery, ware, &c., to form a projection corresponding in shape to the tile or the mounts.

11,048.—VENTILATING SEWERS: *Thos. Douglas.*—This invention consists of a chamber or box, containing rotary fans or arms provided by this inventor, and connected by pipes to the upper part of the sewer. These fans rotating draw the gases from the sewer, and by an exit-pipe, force them through a specially constructed chamber, or vessel containing disinfectants through which they are passed up to the outer air.

11,133.—WINDOW SASHES AND FRAMES: *T. Downie.*—According to this specification, on each side of the window vertical slides are fixed, which move by counterbalance weights. To the slides a sash is attached by hinges, so that it has not only the ordinary up and down motion, but swings back into the room for cleaning, &c.

11,796.—COMPOUND CEMENT SLABS, &c.: *E. Dupont.*—Millboard, or any thin supporting plate, is used in conjunction with cement, the cement afterwards giving strength.

20,331.—VENTILATING COWL: *J. B. Swann.*—According to this patent, a high-pitched screw is fixed in a flue, and curved plates or cups actuate it, the wind acting as the motive power.

NEW APPLICATIONS FOR PATENTS.

June 8.—9,662, W. Bates, Sash and Casement Fasteners.—9,700, L. Kubala, Stoves, &c.—9,710, E. Copland, Ventilators.

June 9.—9,733, W. Vance, Shutters for Fire-grates.—9,783, W. Garner and T. Connaughton, Plumbs and Levels.—9,799, F. Weldon, Sash-fastener.

June 10.—9,816, H. Cracknell, Duplex Knocker, to knock inside a front door as well as out.—9,819, W. Pain, Carpenters' and Joiners' Hammers.—9,831, E. Russ, Window-sash Fasteners.—9,835, R. Tapscott, Self-closing Water-taps.—9,847, M. Norman, Sash-fasteners.—9,878, J. Gordon, Sash-fasteners.—9,882, G. Guynemer, Gate-latches.

June 11.—9,892, S. Gratrix and others, Flushing Cisterns.—9,896, E. Barnes, Sash-fasteners.—9,912, J. White, Window-fastenings.—9,932, W. Hayne, Fireproof Paint.—9,941, H. Mills, Sash-fasteners.

June 12.—9,983, A. Gryles, Sash-fastener, &c.—9,990, T. Brand, Bricks, Chimney-pots, and Tiles.—10,006, G. Wragge, Making and Burning Bricks.—10,010, W. Key, Heating and Ventilating Buildings.—10,029, B. Mudler, Door Pivots.—10,036, C. Calot, Varnish.

June 13.—10,044, E. Brooke, Machines for Pressing and Moulding Bricks, Earthenware Pipes, &c.—10,055, R. Gibson and M. Williams, Window-sash Fasteners.—10,057, W. Stock, Syphon Flushing Cisterns and Water-waste Preventers.—10,059, A. Grimshaw and T. Jones, Sash fasteners.—10,063, G. Mellor, Sash-fastener.—10,065, C. Priestley, Sash-fastener.—10,073, J. Bennett, Roof Tile, and Method of Laying and Fixing same.—10,077, W. Rundell, Screws and Tools for inserting same.—10,080, A. Schofer, Drying Cement, Clay, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

8,991, J. Forster, Door-knobs.—7,123, J. Richmond, Fire-places.—7,194, E. Jones, Window-sashes, &c.—8,202, P. Nessi, Lamps or Hand Stoves for Burning off Paints.—8,311, G. Chambers and others, White Lead.—8,533, A. Morrison and M. Ingram, Water-closets, &c.—8,559, E. Singleton, Disinfecting Water-closets and the like.—8,610, A. Gutensohn, Producing Lead-dust and of converting the same into White Lead.—8,649, J. Tylor, Regulating and Limiting the supply of water from Water-mains to Service-pipes.—8,775, N. Lines, Water-closet Cisterns.—9,007, W. Thompson, Construction of Panelled Articles, such as Doors, &c.—9,012, J. Noel, Chimney or Ventilator-tops.—9,421, E. Pratt, Portable Scaffolding.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

12,219, J. & I. Helliwell, Mantel-pieces.—665, W. Dermieg, Pipes for Sanitary and other purposes.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JUNE 15.—By *Weatherall & Green*: The residence "Barham," Wray-pk.-rd., Reigate, f., r. 120*l.*, 2,000*l.*; "Silwood House," and 3a. 3r. 4p., f., r. 225*l.* 12s., 2,750*l.*; an enclosure of f. land and right of maintaining the water-pipes connected therewith in perpetuity, 310*l.*—By *E. Robins & Hirne*: 25, Rosslyn-hill, Hampstead, u.t. 57 yrs., g.r. 12*l.*, 1,225*l.*—By *Montagu & Robinson*: 30 and 31, Palmerston-rd., Kilburn, u.t. 72 yrs., g.r. 16*l.* 16s., 810*l.*; f.g.r.'s of 12*l.*, with reversion in 95 yrs.; West Heath-cottages, Hampstead, 3054.; f.g.r. of 13*l.* 10s., with reversion in 48 yrs., Ambridges-cottages, 340*l.*; a plot of f. building land, North End-rd., 1,200*l.*—By *Farebrother, Ellis, & Co.*: 14, Broomfield-villas, Bowes-pk., f., r 36*l.*, 450*l.*; 1 to 8, Broomfield-cottages, f., r. 127*l.* 8s., 1,000*l.*; a cottage with plot of land adjoining, f., r. 26*l.* 10s., 300*l.*; a f. building estate of 10a 2r. 20p., 2,500*l.*; enclosure of f. building land, 4a. 2r. 25p., 750*l.*; 1, 2, and 3, Squire's Mount-cottages, Hampstead, f., r. 99*l.*, 1,600*l.*; f.g.r. of 12*l.*, with reversion in 49 yrs., Portland-villas, 360*l.*; two f. houses and shops in High-st., Esher, f., r. 76*l.*, 1,275*l.*; an enclosure of meadow land, 3a. 1r. 24p., f., Edmonton, 200*l.*; enclosures of meadow land, 4a. 2r. 8p., f., Tottenham, 200*l.*—By *Fuller, Horsey, & Fuller*: "Holmedale," Worpie-rd., Wimbledon, u.t. 13 yrs., g.r. 13*l.*, 650*l.*; f. cottage and enclosures of land, 8a. 2r. 0p., Oxted, Surrey, 750*l.*; two plots of f. building land, Horley, 360*l.*; an enclosure of land, 4a. 3r. 12p., f., 310*l.*; four cottages and a plot of land, f., 450*l.*—By *Messrs. Cronk*: "The Greatness Mill," and about 6 acres, f., Sevenoaks, Kent, 2,420*l.*; "Alpine Lodge," and about 16 acres, f., r. 95*l.*, Firbright, Surrey, 1,600*l.*—By *Prickett & Venables*: "Brightside," Station-road, f., Barnet, 1,055*l.*; 1 to 10, James-grove, Peckham, f., r. 38*l.* 12s., 2,760*l.*; 15 to 20, James-grove, f., r. 132*l.* 8s., 1,610*l.*; 25, James-grove, u.t. 39 yrs., g.r. 6*l.* 6s., r. 32*l.* 8s., 165*l.*; a f.g.r. of 13*l.* 15s., with reversion in 68 yrs., 520*l.*; 41 to 44, James-grove, f., r. 126*l.* 12s., 1,070*l.*; 53, Rosemary-rd., f., r. 34*l.*, 340*l.*; 49 to 59 (odd), Commercial-rd., f., 2,020*l.*

JUNE 16.—By *Chinnock, Galsworthy, & Co.*: "Pinkney's Cottage," and 8a. 2r. 21p., f., Maidenhead Thicket, Berks, 2,300*l.*—By *Rogers, Chapman, & Thomas*: 27, Gloucester-st., Belgravia, u.t. 37 yrs., g.r. 10*l.*, 600*l.*; 46, Charlwood-st., u.t. 41 yrs., g.r. 8*l.*, r. 70*l.*, 650*l.*; 50, Charlwood-st., u.t. 47 yrs., g.r. 1*l.*, r. 70*l.*, 670*l.*; 60, Denbigh-st., u.t. 42 yrs., g.r. 8*l.*, r. 70*l.*, 680*l.*; 73, Denbigh-st., u.t. 40 yrs., g.r. 8*l.*, r. 75*l.*, 725*l.*; 9, Thurloe-sq., Brompton, u.t. 33 yrs., g.r. 4*l.* 10s., 170*l.*—By *F. Hards & Bradly*: "The Mount," Ulundi-rd., Blackheath, f., 1,050*l.*; A plot of f. building land adjoining, 300*l.*; 21 and 23, High-st., Eltham, f., with goodwill of a butcher, 1,750*l.*; 47, Hither Green-lane, Lewisham, u.t. 75 yrs., g.r. 8*l.* 10s., r. 31*l.* 16s., 195*l.*—By *Foster & Cranfield*: 30, Eagle-st., Holborn, f., r. 120*l.*, 1,450*l.*; 111, Shooter's Hill-rd., Blackheath, u.t. 55 yrs., g.r. 14*l.* 4s. 7d., 800*l.*; 1, 3, 9, and 17, St. Ann's-rd., Wandsworth, f., r. 100*l.*, 1,270*l.*; 229, St. John's-hill, f., r. 55*l.*, 700*l.*; 36 to 42 (even) Malham-rd.,

Forest-hill, f., r. 1., 4s., 830l.; 57 to 63 (odd), Malham-rd., f., 115l. 6s., 830l.; F.g.r. of 125l. 6s., with reversio in 71 yrs., Malham-rd., 270l.; f.g.r. of 4l., a reversion in 75 yrs., Nottingham-rd., Battersea, 55l.; 5 and 7, St. Ann's-rd., Wandsworth, u.t. 55 s., g.r. 12l., r. 68l., 620l.; 24, Lilleshall-rd., Clapham, and a ground-rent of 3l. 3s., u.t. 8 yrs., g.r. 7s., 105l.—By *Dowsett & Co.*: 21, The Pavement, Clapham, f., r. 100l., 1,160l.; 85, Bromell's-rd., f., 45l., g.r. of 20l., with reversion in 53 yrs., Bromell's-rd., 80l.—By *Weston & Son*: 7, Bellefields-rd., Brixton, u.t. 3 yrs., g.r. 8l., 300l.; 10, Kepler-rd., u.t. 76 yrs., g.r. 10s., r. 50l., 416l.; 22, Tindall-st., f., r. 20l. 18s., 330l.; 5, Overton-rd., u.t. 70 yrs., g.r. 8l., 450l.; 75 and 79, Brixton-hill, u.t. 74 yrs., g.r. 50l., r. 130l., 1,110l.; 1, Angel-pk. gardens, f., 1,000l.—By *James & Co.*, f., 50l.; 46, Chryssell-rd., u.t. 10 yrs., g.r. 5l., r. 30l., 100l.; 3 and 25, Ingleton-st., u.t. 4 yrs., g.r. 5l. 8s.; 76 and 78, Ingleton-st., u.t. 13 yrs., g.r. 5l. 6s. 9d., total r. 82l. 3s., 150l.; 1, De Laune-st., Kennington, u.t. 73 yrs., g.r. 6l., r. 33l., 600l.; 13, Cleaver-st., u.t. 19 yrs., g.r. 8l., r. 36l. 8s., 295l.; 32, Naylor-rd., Peckham, u.t. 16 yrs., g.r. 5l. 5s. 3d. and 3s., Naylor-rd., u.t. 12 yrs., g.r. 10s., total r. 65l., 110l.; 31, Dalyell-rd., Stockwell, u.t. 73 yrs., g.r. 6l., r. 24l., 280l.— By *Nokes & Nokes*: 1 and 2, Gray's Inn-passage, Holborn, f., r. 32l., 1,005l.

JUNE 17.—By *A. Watson*: 27 and 29, Dimsdale-rd., Pulham, f., r. 59l. 16s., 500l.; 29, Kenilworth-rd., Old Ford, f., 460l.; 1, Park-ter., Southgate, u.t. 91 yrs., g.r. 12l. 10s., r. 70l., 900l.—By *Gadsden, Sons & Ellis*: 1, Clerkenwell, u.t. 24 yrs., g.r. 8l., r. 80l., 650l.; f.g.r. of 20l., with reversion in 15 yrs., Walworth, 670l.—By *Elgood & Fuller*: 3, Carlisle-st., Soho, f., r. 100l., 2,000l.; 37, Soho-sq., and 2, Carlisle-street, f., r. 255l., 5,250l.; 13, Great College-st., Westminster, u.t. 8 yrs., g.r. 11s., r. 45l., 185l.—By *E. & S. Smith*: 2, Fore-st., Spitalfields, u.t. 64 yrs., g.r. 5l., r. 52l., 395l.—By *E. Smith & Co.*: 6, Panton-st., Haymarket, f., r. 140l., 2,550l.; 3, York-st., Covent-garden, f., 1,900l.—By *D. Young*: 140 and 142, High-st., Putney, f., r. 260l., 4,200l.; 134, 136, and 138, High-st., f., r. 370l., 5,245l.; 14, Kepler-rd., Brixton, u.t. 77 yrs., g.r. 8l., r. 65l., 530l.; 119, Morrimore-rd., Newington, u.t. 62 yrs., g.r. 4l. 10s., r. 32l., 325l.; 51, Sidney-rd., Stockwell, u.t. 48 yrs., g.r. 9l. 10s., r. 32l., 250l.; 25 to 31 (odd) D'Eynsford-rd., Camberwell, u.t. 64 yrs., g.r. 11l., r. 103l., 890l.—By *W. & F. Houghton*: "Elm House," Forest-rd., Walthamstow, and 1a. 2r. 3p., f., 4,400l.; enclosures of building land, 12a. 2r. 24p., f., 5,100l.; four f. cottages and garden ground, 3a. 1r. 19p., 420l.

JUNE 18.—By *T. G. Wharton*: F.g.r. of 12l., with reversion in 92 yrs., Kender-st., New Cross, 355l.; f.g.r. of 4l. with reversion in 18 yrs., 135l.; f.g.r. of 6l., with reversion in 52 yrs., Dolling-pl., 140l.; 112, 114, and 116, Kender-st., and a plot of land, f., r. 65l., 580l.; 118, Kender-st., f., r. 24l., 210l.; 1, Dillingen-rd., and a plot of land, f., 76l. 14s., 725l.—By *H. S. Woodcock*: 2 and 12, Clifton-st., Clapham, u.t. 34 yrs., g.r. 8l., r. 67l. 4s., 866l.; 20 and 24, Clifton-st., u.t. 34 yrs., g.r. 8l., r. 62l. 8s., 825l.—By *Walton & Lee*: The f. residence "Thornhill," West Cowes, I. of W., in one lot, 6,000l.—By *E. Stimson*: 31, 33, and 35, Birkbeck-rd., Tulse Hill, f., r. 72l., 1,000l.; 6, 7, and 8, Valley-rd., u.t. 96 yrs., g.r. 18l., r. 120l., 1,200l.; 12, Valley-rd., u.t. 96 yrs., g.r. 6l., r. 36l., 395l.; 23, Faunce-st., Kennington, u.t. 73 yrs., g.r. 6l., r. 36l., 300l.; 5 and 7, Osprey-st., Rotherhithe, u.t. 60 yrs., g.r. 5l., r. 46l. 16s., 330l.; 16, 18, and 20, Osprey-st., u.t. 60 yrs., g.r. 7l. 10s., r. 70l., 450l.—By *Newbon & Co.*: 49, Calthorpe-st., Gray's-inn-road, u.t. 51 yrs., g.r. 6l., r. 55l., 560l.; 97 and 99, Hemingford-rd., Barnsbury, u.t. 51 yrs., g.r. 12l., r. 88l., 770l.; 137 and 139, Hemingford-rd., u.t. 51 yrs., g.r. 14l., r. 83l., 865l.; 163, Hemingford-rd., u.t. 51 yrs., g.r. 5l., r. 34l., 545l.; 15, 16, and 17, Shepperdess Villas, Canonbury, u.t. 54 yrs., no g.r., r. 167l. 10s., 1,855l.; 114, Shepperdess Walk, Hoxton, u.t. 6 yrs., g.r. 4l. 10s., r. 30l., 80l. By *Glasier & Sons*: "Yew Cottage," Heath-road, Twickenham, f., 1,250l.; 18 Noel-st., Soho, f., r. 75l., 1,100l.; 21, Noel-st., f., 1,200l.; 3, 5, and 6, Cheval-pl., Brompton-rd., f., r. 80l., 1,670l. By *H. J. Bliss & Sons*: 56, 58, and 60, Sale-st., Bethnal Green, f., 320l.; 40 and 42, Old Ford-rd., u.t. 10 yrs., g.r. 6l., 150l.; 231 and 239, Dalston-lane, Hackney, u.t. 47 yrs., g.r. 9l. 12s., r. 63l., 670l.—By *D. Watney & Sons*: Enclosures of f. land, 108a. 0r. 14p., Lingfield, Surrey, 2,250l.; "New-pl. Farm," and 20a. 3r. 32p., f., 1,570l.; "Hay lands," and 49a. 0r. 19p., f., 2,725l.; f. accommodation land, 56a. 2r. 3p., 2,320l.; "The College," and 6a. 3r. 7p., f., 900l.; "Portway House," Upton-cross, and 10, Neville-rd., f., r. 73l., 960l.—By *Beadel & Co.*: 97 to 141 (odd), New Kent-rd., Newington, f., 12,800l.; 6 to 10, County-ter.-sts., f., and 1 to 10, Union-pl., f., and 50 and 52, Aylifie-st., f., 2,360l.; 12, 13, 14, 18 to 21, and 20a, County-ter.-st., and 9 and 10, Woodman-pl., f., 1,420l.; 22 to 33, County-ter.-st., 1 to 8, Brunswick-ct., 1 to 15 (odd), and 16 to 28 (even), Arnott-st., and 27, 29, and 31, Aylifie-st., 7,450l.; 1 to 7, Harper-st., 2 to 12, Stanstead-pl., and a plot of land, f., 5,490l.; 1 to 5, Woodman-pl., f., 550l.; 14, 14a, 16 to 48, Aylifie-st., f., and 1 to 6, Providence-pl., f., 5,820l.; 6, 8, 10, 11 to 17 (odd), and 21, 23, and 25, Aylifie-st., 1 to 6, Harmer's-bldgs., 2,780l.; 13, 15 to 18, and 20, Harper-st., f., 2,070l.; 9, 10, 11, and 12, Harper-st., "The Rising Sun" p. h., and 17 and 19, Arnott-st., f., 3,500l.

JUNE 19.—By *Green & Son*: 91, Upper Tollington-pk., Stroud Green, u.t. 35 yrs., g.r. 9l. 10s., 440l.; "Avenue House," St. Margaret's-rd., Twickenham, u.t. 90 yrs., g.r. 10l., r. 40l., 375l.—By *Fuller & Fuller*: 82, 83, and 84, Whitechapel-rd., 2 to 20, Pavilion yard and stabling, u.t. 46 yrs., g.r. 135l., and u.t. 12 yrs., g.r. 200l., 2,550l.; 35, Buckingham-road, Stratford, f., r. 50l., 500l.—By *C. & H. White*: 72 to 78, Stamford-rd., Forest Hill, u.t. 66 yrs., g.r. 16l., 600l.; 37 to 39, and 41, Methley-rd., Kennington, u.t. 40 yrs., g.r. 5l., 550l.; 491 and 493, Wandsworth-rd., u.t. 31 yrs., g.r. 14l., r. 72l., 505l.—By *Debenham, Tewson, & Co.*: 13, Ladbroke Grove-rd., Notting Hill, u.t. 72 yrs., g.r. 10l., r. 100l., 1,810l.; 11, Ladbroke Grove-rd., and 6, Railway-mews, u.t. 72 yrs., g.r. 10l. r. 150l., 2,810l.; 10, Railway-mews, u.t. 72 yrs., g.r. 1d., r. 16l., 265l.; 38, Norland-rd., and 10 to 15, Beaumont-st., u.t. 18 yrs., g.r. 20l., r. 130l., 960l.; 45 to 49, Norland-road, u.t. 18 yrs., g.r. 40l., r. 256l. 10s., 2,170l.; 39 to 44, Norland-rd., u.t. 18 yrs., g.r. 48l., r. 300l., 1,955; "Norland Yard" Stabling, Norland-rd., u.t. 18 yrs., g.r. 7l., r. 75l., 480l.—57 to 67 (odd) Angill-st., Fulham, u.t. 74 yrs., g.r. 25l. 4s., 400l.; 81 to 99 (odd), Argill-street, u.t. 74 yrs., g.r. 42l., r. 182l., 700l.; 30 to 38 (even), Chelmsford-st., u.t. 73 yrs., g.r. 15l., r. 78l., 920l.; 30, Abbey-rd., St. John's Wood, f., r. 80l., 1,110l.; "Hyde Lodge," Kingsbury-rd., f., 600l.; 1, 2, and 3, Church-lane, Hendon, f., r. 44l., 460l.; a plot of freehold land, Jeremy Green's-lane, Edmonton, 75l.

[Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.		
ton	8/0/0	9/0/0
Teak, E.I.. load	6/10/0	14/0/0
Sequoia, U.S.ft.cu.	2/3	3/0
Ash, Canada load	2/10/0	4/5/0
Birch, do.	2/5/0	3/10/0
Elm, do.	3/10/0	4/15/0
Fir, Dantzic, &c.	3/0/0	3/15/0
Oak, do.	2/10/0	4/10/0
Canada	4/17/6	6/10/0
Pine, Canada red	2/10/0	3/10/0
Do, yellow	2/0/0	5/10/0
Lath, Dantzic, fath	5/0/0	6/0/0
St. Petersburg	5/0/0	7/0/0
Deals, Finland, 2nd & 1st std 100	7/15/0	10/10/0
Do, 4th & 3rd...	7/5/0	8/5/0
Do. Riga, &c.	6/5/0	7/15/0
St. Petersburg, 1st yellow	9/10/0	14/10/0
Do, 2nd yellow	8/5/0	9/5/0
Do, white ...	6/15/0	10/10/0
Swedish	6/15/0	15/15/0
White Sea ...	8/5/0	17/5/0
Canada, Pine 1st	13/0/0	24/0/0
Do, do, 2nd...	9/0/0	13/10/0
Do, do, 3rd, &c.	6/10/0	10/0/0
Do, Spruce, 1st	8/15/0	11/0/0
Do, do, 3rd & 2nd	6/5/0	7/15/0
New Brunswick	5/5/0	7/5/0
Battens, all kinds	3/10/0	16/10/0
Flooring Boards, cargo at sq., 1 in. prep.		
1st	0/10/0	0/14/0
Do, 2nd ...	0/9/0	0/10/6
Other qualities	0/5/0	0/7/6
Cedar, Cuba ft.	/4	/4
Honduras, &c.	/4	/5
Mahogany, Cuba.	/4½	/6½
St. Domingo, cargo at	/4½	/6½
Mexican do. do	/4½	/5½
Tabasco do. do	/5½	/7
Hond'as do. do	/8	/8½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio	10/0/0	20/0/0
Bahia	9/0/0	15/5/0

TIMBER (*continued*).		
Satin, St. Domingo ..... ft.	0/0/10	0/1/8
Porto Rico	0/0/10	0/1/6
Walnut, Italian..	0/0/3½	0/0/7
METALS.		
IRON—Bar, Welsh, in London..ton	6/5/0	6/15/0
Do. do. at works in Wales	5/15/0	6/5/0
Do. Staffordshire, in London	6/5/0	7/0/0
Corrugated—British, cake and ingot	56/0/0	57/0/0
Best selected ..	58/0/0	60/0/0
Sheets, strong..	66/0/0	0/0/0
Chili, bars	52/10/0	0/0/0
YELLOW METAL	0/0/6	0/0/6½
LEAD — Pig, Spanish ...ton	12/13/9	12/15/0
English, com. brands	12/15/0	13/0/0
Sheet, English, 3 lbs. per sq. ft. and upwards ..	14/10/0	0/0/0
Pipe	15/0/0	0/0/0
ZINC — English sheet ..... ton	27/0/0	0/0/0
Vieille Montagne	27/10/0	0/0/0
TIN—Straits ...	90/10/0	0/0/0
Australian ...	90/15/0	0/0/0
English ingots	94/10/0	0/0/0
OILS.		
Linseed ..... ton	21/15/0	22/0/0
Cocoanut, Cochin	34/0/0	0/0/0
Do, Ceylon	28/10/0	0/0/0
Palm, Lagos ...	24/13/0	0/0/0
Rapeseed, English pale	29/15/0	0/0/0
Do, brown	28/5/0	0/0/0
Cottonseed, refined	20/10/0	0/0/0
Olein	21/15/0	24/0/0
Lubricating, U.S.	7/0/0	0/0/0
Do, refined	8/0/0	12/0/0
TAR — Stockholm ..... barrel	0/19/6	1/0/0
Archangel	0/18/0	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than 12 noon on Thursdays.*]

ALMONDSBURY.—For erecting cottage-hospital and institute, Almondsbury, Gloucestershire. Mr. C. E. Pleming, F.S.A., architect, Marlborough :—

Trask	£5,020
Stephens, Bastow, & Co.....	4,646
W. Brock & Son	4,500
W. Cowlen & Son	£4,573
J. Perkins.	4,397

BUDLEIGH SALTERTON (Devon).—For the erection of a new church, for the Hon. Mark Rolle. Mr. G. H. Fellowes Prynne, architect, 10, Torrington-square, W.C. Quantities by Mr. R. Henry Hale, surveyor, 6, Duke-street, Strand, W.C. :—

	In Monk's Park Stone.	In Doulting Stone.
F. E. Carter	£9,970 0	£9,350 0
J. C. Pilliner	9,496 0	8,857 0
J. R. Gibbard.....	9,280 0	9,530 0
Reed, Blight, & Co.....	8,779 0	8,837 0
Stephens Bastow	8,389 0	8,494 0
Phillips.....	8,218 0	8,235 0
R. R. Facey	7,997 0	7,997 0
F. Kimberly	7,724 10	7,928 0
W. Light Ltd. & Co.	7,544 10	7,544 10
Duncombe & Son, Exeter* ..	6,950 0	7,000 0
Parr Bros.	6,778 0	6,880 0

* Conditionally accepted

BUSHEY (Herts).—For new shop front and alterations to premises, Villiers-road, for Mr. R. R. Gault. Mr. Albert E. Pridmore, architect, 2, Broad-street Buildings, E.C. :—

Lundy & Co.	£122 0
Simms	125 10
Heatley & Annan.....	£123 10

BUTLOCK'S HEATH (Hants).—For the enlargement of Butlock's Heath School, for the Hound School Board. Mr. W. B. Hill, architect, 62, Above Bar, Southampton :—

H. J. Sanders	£1,720 0 0
C. & A. Witt...	1,700 0 0
Lucas Bros. & Co., Limited	1,449 0 0
John Crook & Son	1,442 15 0
John Hinton, Woolston*	1,328 0 0

* Accepted, subject to approval of the Education Department.

CADNAM (Hants).—For building pair of cottages at Cadnam, New Forest, Hants, for Mr. Henry Glasspool. Mr. William Burrough Hill, architect, Southampton :—

C. Barter	£497
J. E. Gale	490
W. Barter, Brambshaw*	375

* Accepted.

CARLISLE.—For the erection of four houses in Molesworth-street, Gregate, for Mr. Potter. Mr. H. H. Hodgkinson, architect, 33, Bank-street Carlisle :—

Jas. Hewitt	£292 15 0
Jas. Beaty.....	292 0 0
Wm. Gordon, Lonsdale-street (accepted)	494 0 0

CHEPSAM (Bucks).—For alterations to "The George" hotel for Messrs. Salter & Co., Limited. Messrs. Ayres & Aldwin, architects, Watford :—

G. Bartlett	£450
G. Darvell	440
T. L. Turner, Watford*	£397

* Accepted.

CHESHAM (Bucks).—For rebuilding "The Waggon and Horses" public house, for Messrs Salter & Co., Limited. Messrs. Ayres & Aldwin, architects, Watford :—

G. Darlington	£890
A. Mead.....	850
G. Darvell	840
H. M. Dove	£829
T. Turner, Limited*	827

* Accepted.

COLCHESTER.—For the erection of an additional warehouse, Stanwell street, Colchester, for Messrs Hammond & Co. Mr. James F. Goodey, architect and surveyor, Colchester, and 20, Bishopsgate-street, London :—

H. Everett & Son.....	£1,570
T. J. Ward.....	1,510
F. Dupont	1,450
C. Orford	1,445
W. A. Chambers	£1,440
G. Bullen	1,433
A. Dent*	1,383

* Accepted.

ELSTREE.—For the erection of a new Police-station at Elstree, for the Receiver for the Metropolitan Police District. Mr. John Butler, F.R.I.B.A., architect. Quantities by Mr. W. H. Thurr :—

Stimpson & Co.....	£2,430
C. Ansell	2,323
Scrivener & Co.....	2,300
J. T. Chappell	2,257
Grover & Son	2,239
Luther B.	2,220
Willmott & Sons.....	2,198
J. & W. Savage	2,183
C. & J. Wakeham	2,142

FOREST HILL.—For additions and alterations to Lambourne House, Honor Oak-road, for Mr. J. Zuiltman. Messrs. Tolley & Son architects, 66, Cannon street, E.C. :—

W. Marriage	£994 0
Waddington & Co	970 0
Bryan & Son.....	721 0
Roberts & Co.	£558 10
Bla k & Son	635 0

HENDON.—For the construction of the first portion of the low level (pumping) sewer, including the erection of an engine house, &c., for the Hendon Local Board. Mr. S. Slater Grimley, Engineer :—

L. Lloyd	£5,401
Newell & Russell	4,930
W. J. Botterill.....	4,892
A. Kellett	4,805
S. Wood	4,692
R. Ballard	4,677
Neave & Son	4,053
J. Mestrom	£4,666
J. Hayward	4,677
G. Overton	4,640
A. T. Catley*	3,800
D. Jackson, St. Albans (accepted)	3,856

* Received one week late.

HEREFORD.—For the erection of attendants' day-rooms and dormitories, for the Cityand County Asylum. Mr W. W. Robinson, architect, 10, King-street, Hereford. Quantities by the architect :—

Malvern & Son.....	£2,440 0 0
H. Welsh	2,300 0 0
Bevan & Hodges....	2,249 0 0
W. Bowers & Co., Hereford*	£2,187 10 0

* Accepted.

LONDON.—For pulling down and rebuilding the "Green Man," public-house, 13, New-street, W.C., for Mrs. Black and Mr. W. J. Black. Messrs. Prickett & Ellis, architects, 66, Chancery-lane, W.C. :—

Richards.....	£2,750
Grover & Son	2,724
Scrivener	2,642
Boyce	2,638
Holloway	2,584
Smee	2,582
Dearing & Son.....	2,578
Walker	2,548
Fryer	2,540
Boyton	2,530
Mark	£2,525
Whitehead	2,500
Allatt	2,475
Patman & Co....	2,463
Holland.....	2,462
Gould	2,449
Vesé	2,430
Burman.....	2,367
Oldrey.....	2,250

LONDON.—For rebuilding the "George" Tavern, East Harding-street, Fetter-lane, E.C., for the Burton & Lincoln Brewering, Limited. Mr. H. L. Newton, architect, 24, Victoria-street, Westminster. Quantities supplied by Mr. F. Thomson, 5, Great James-street, Bedford-row :—

Edward Howard	£[illegible]
James Brook	3,483
James H. Jarvis	3,450
Wm. and Charles Lapworth	3,400
Kirk & Randall	3,340
R. Edwards	3,330
S. F. Lamble	3,279
Allen Brothers	3,276
S. Cowell	3,250
H. Ferguson & Sons	3,241
John Mills	3,231
J. Young & Co.....	3,230
Patman & Fotheringham	£2,774
G. Stephens & Son	2,250
Foster & Appleton	2,240
W. Harrold, Limited	2,238
Lawrance & Medway	2,223
J. Isaac	2,220
F. Marks	2,212
Dove Brothers	2,200
Adams & Sons	2,187
Lamb	2,150
Chatfield & Co.	1,995

* Accepted.

LONDON.—For the erection of new factory and store at Black-stock-place, Finsbury-park, for Mr. H. S. Smith. Mr. Banister Fletcher, architect :—

Cole & Sons	£2,797
John Mark	2,778
Hedgcock & Son	2,698
Williams (late)	£2,237
Perry & Co.	2,225
Latham	2,201

LONDON.—For providing and fixing heating apparatus on the low-pressure hot-water system for the enlargement of the St. Dunstan's-road School, Hammersmith, which is now in course of erection, and also for extending the apparatus in the rooms in the old portion of the school and for re-constructing the existing apparatus, for the School Board for London. Mr. T. J. Bailey, Architect :—

Isaac Dixon & Co.	£198 0 0
Croggan & Co., Ltd...	187 10 0
T. Crways.....	£149 13 6

LONDON.—For proposed extension of saloon bar at house, "All's Tavern," Stoke Newington Road and Mildmay Park. Messrs. G. Carter & Son, architects, 342, Holloway-road, N. :—

Collins	£236 10 6
Yardley & Sons	208 0 0
Shenfield	205 0 0
A. Lucas, Park-street, Newington (accepted)	£225 0 0

[Exclusive of powering, gas, and decorations.]

LONDON.—For alterations to the off-licence premises, 96, St John's-road, Holloway, for Mr. Stone. Messrs. G. Carter & Son, architects, 342, Holloway-road :—

Stevens Bros.	£152
Houghton & Son	148
H. Cattle	£134

LONDON.—For re-decorating Waterloo-road Bible Christians chapel :—

Parsons	£139
Squires	147
W. Vanstone*	£116

* Accepted.

LONDON.—For the erection and completion of new bank at West Kensington, for Lloyds' Banking Company. Mr. A. R. Streeting, architect :—

Wimshurst & Co.	£5,20[illegible]
Cowell	5,272
Pawsley	5,[illegible]
E. F. N. Chingage	5,[illegible]
Peto Bros.	£5,[illegible]
Flew	5,[illegible]
S. Sabey & Son	5,[illegible]

LONDON.—For erecting dwelling-house, at Albert Grove, Morpeth-road South Hackney, N.E., for Mr. Thomas H. Wood. Mr. Joseph G. Needham, architect, 11, Powerscroft-road, Clapton, N. :—

C. Howard	£770
Walker Bros.	658
Coulsell Bros.	623
N. Thomas	£595
J. & F. Bate*	5[illegible]

* Accepted.

LONDON.—For alterations and additions to offices, for Messrs. J. Stone & Co., Deptford. Mr. Theo. Dunn, architect :—

Nightingale	£1,514
Kirk & Randall	1,480
Lenz	1,390
Holloway	£1,470
S. J. Jerrard...	1,243

LONDON.—For the erection of stabling, &c., at Camberwell, for Mr. H. Turner. Mr. E. Stanson, architect, 2, New Kent-road, S.E. Quantities not supplied :—

Edwards & Medway	£2,[illegible]
Goad	2,001
Castle	2,045
Marsland	£1,925
Burman & Sons	1,855

LONDON.—For re-decorations, &c., at 3, Bentinck-terrace, Regent's Park. Mr. Alfred Bibbs, architect :—

Puzey & Lumley	£238
Carmichael	226
Belcher & Ullmer	185
Moody	£183
Langridge & Sons*	175

* Accepted.

LONDON.—For making up the carriage-ways of Beversbrook and Tytherton-roads, Tufnell-park, for the Vestry of St Mary, Islington. Mr. J. Patten Barber, C.E., Surveyor :—

Beversbrook Estate.	Tytherton-road.
G. G. Rutty & Son	£[illegible] 0 0
Mowlem & Co.....	454 0 0
T. Adams	387 0 0
C. Taylor	375 10 0
Wm. Griffiths	341 0 0
W. Walker, Upper Holloway	338 0 0*

* Accepted.

LONDON.—For erecting seven new shops and dwelling-houses, Nos. 7 and 9, Holloway-road. Mr. R. Bennett, architect, 1, Lawrence-lane, Cheapside, E.C. :—

E. Lawrance & Sons	£6,892
G. Parker	6,600
W. Wells	£5,507

NEW FERRY (Cheshire).—For the erection of new Wesleyan Chapel, New Ferry, for the Building Committee. Mr. T. W. Cubbon, architect, Hamilton-square, Birkenhead. Quantities by the architect:—

T. Myers	£2,895 0 0	John Shaw	£2,449 19 8
W. H. Bleckley & Co.	2,775 0 0	T. W. Corwell	2,363 19 9
Baffles & Campbell	2,744 10 0	John Barnes	2,321 10 8
Samuel Webster	2,714 0 0	Kelly Bros., Walton, Brown & Backhouse	2,489 0 0
		Liverpool*	2,279 0 0

* Accepted.

PORTSMOUTH.—For additional class-rooms and staircase to the Hartford street schools, Portsmouth, for the Portsmouth School Board. Mr. A. H. Bone, architect, Hanover-street, Portsea, Portsmouth. Quantities by architect:—

Staples	£2,925 0 0	Messrs. Light	£1,838 0 0
Boulton	1,900 0 0	Potter	1,844 0 0
Crocker	1,890 0 0	Adding	1,787 0 0
Jones	1,878 0 0	Leadbeatter	1,773 0 0
Matthews	1,848 17 9	Lewis, Portsmouth*	1,662 0 0

* Accepted.

PRESTON.—For additions and alterations to the Savings Bank, Preston, for the Bank Trustees. Messrs. Park & Son, architects. Quantities supplied by the architects:—

W. Hothersall	£937 0	J. Cartmell	£889 0
J. Walmsley	926 0	R. Alston	845 6
T. Croft	886 5	Walmsley & Co., Preston*	845 6

* Accepted. [Architect's estimate, £887.]

SANDAY (Orkney).—For erecting Volunteer Artillery Drill-hall, Sanday, Orkney. Mr. T. S. Peace, architect, Kirkwall:—

Jos. M. Chalmers, Stromness	£630 8 0

SHANGHAI.—For the construction of egg-shaped sewers, at per chang (10 feet run), for the Shanghai Municipal Council. Mr. Charles Mayne, Engineer and Surveyor:—

Contractor	Woosung road, 1 ft. 6 in. by 1 ft. 700 ft. run.	Wingpo-pu road, 2 ft. by 1 ft. 6 in. 360 ft. run.	Bubbling well road, 1 ft. 6 in. by 1 ft. 950 ft. run.	Miller road, 1 ft. 6 in. by 1 ft. 880 ft. run.	Woosung road, 2 ft. by 1 ft. 4 in. 680 ft. run.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Yah Kee & Co.	1 8 8½*	2 1 11½	1 8 8½	1 8 8½*	1 16 2½*
Chang Yung Kee	1 13 1½	..	1 13 1½	1 11 6½	..
Chang Sing Tai	1 14 6½	1 18 10½*	1 7 10*	1 10 0½	1 17 11½
W. Chu Wan	1 14 6½	1 18 9	1 14 5½	1 14 6½	1 18 10½
Chang Jee Kee	..	2 6 4½	..	..	..
Chen Yeuk Shing	..	2 12 4½	..	..	..
Chang Sing Tai*	Haldury-road.—Laying only 1,000 ft. run of Messrs. Sharpe, Jones, & Co.'s 21-in. concrete tubes, at 7s. 6d. per chang.				
E. Chong*	Circular cast-iron manhole covers, at £9. 7s. 11½d. per ton				
Jn. Chung*	Square cast-iron manhole covers, at £9. 17s. 10½d. per ton.				
E. Chong*	Cast-iron gully covers, at £12 7s. 4d. per ton.				
Jn Chung*	Cast-iron lamp-standard, at £18. 16s. 2½d. per ton.				
Jn Chung	Cast-iron street name plates, at 4½d. per letter.				
Joe & Ming Kee*	Supplying and laying 6,000 ft. run of Soochow granite kerb and channel on 6-in. lime concrete, at 17s. 0½d. per chang.				

* Accepted.

SLOUGH.—For the erection of new villa residence, at Slough. Messrs. Edgington & Summerbell, architects:—

J. L. Hollis	£1,902 0 0	B. E. Nightingale	£1,893 0 0
W. Watson	1,850 0 0	W. Ashfold	1,880 0 0
J. Bowyer	1,820 0 0	G. Wernham	1,770 15 6

WATFORD (Herts).—For alterations at Oxford Lodge, Clarendon-road, for Mrs. Oddie. Messrs. Ayres & Ardron, architects, High-street, Watford:—

Dove	£297	Clifford (too late)	£90
Waterman	294	T. Turner, Limited (too late)	90
Neal, Watford (accepted)	280		

WATFORD (Herts).—For the erection of first portion of new brewery, at the Cannon Brewery, for Messrs. Benskin & Co. Messrs. Ayres & Ardron, architects, High street, Watford:—

W. B. Neal	£4,513	Thos. Turner, Limited	£4,297
G. & J. Waterman	4,463	H. M. Dove, Watford*	4,274

* Accepted

WATFORD (Herts).—For the erection of cooper's shed, at the Cannon Brewery, for Messrs. Benskin & Co. Messrs. Ayres & Ardron, architects, High street, Watford:—

Neal	£749 10 0	T. Turner, Limited, Watford*	£717 0 0
Waterman	739 0 0		
Dove	727 0 0		

* Accepted.

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